

# THE LEADING EDGE

Newsletter of the Northern Illinois Rocketry Association,  
NAR Section #117, Proud Winner of the 1996 Rockwell Newsletter Trophy!

Volume 20, Number 3  
May/June 1997

## From the Editors Keybored

Greetings! As you know, NIRA is having trouble finding a new flying home this year. We've been able to fly from a sod farm on the edge of nowhere, but we really need to find a site closer to home. If you know of a place that support 50 people, is large enough to fly up to E motors, and isn't crowded on a Sunday afternoon, please let NIRA President Cheri Chaney know (630-462-0260).

The committee to present NIRA's plea for a launch site at the Green Valley Forest Preserve has been getting their act together and will be making the presentation as soon as the Forest Preserve Board can schedule a meeting. We've had a good relationship with the Forest Preserve for the last 7 years, and we hope to continue to work with them.

In other club news, Bob Kaplow has located Indian Pumps and we voted to authorize him to purchase two of them for the club. The only problem now is where to store them. The NIRA equipment is spread out between the houses of Bob Kaplow, Ric Gaff, Bob Wiersbe, and Mark Bundick. Maybe we should just buy a small house somewhere to store all this stuff.

If you are willing to do some driving, there are 3 launches you can attend this month! SMURFF I is the 17th & 18th in Muncie, Indiana (info below), the NIRA launch is the 25th (make a note of that!), and there are 2 (count them, two!) launches going on at Bong Recreation Area in Wisconsin on May 31. One of them is an NAR contest, 14AL97 (One For All), hosted by WOOSH, a brand new NAR Section (#558). The other is a HPR launch hosted by Tripoli Wisconsin. Both launches will held on the runway, so you can get two shows for the price of admission!

But, that's not all! You can also attend the Moosehart R/C Show and help NIRA demo rocketry on June 7th! This has been an annual event for NIRA for four years now, and it really is fun. The R/C show features R/C planes, cars, boats, control line planes, kites, and of course, ROCKETS! We typically do two 45 minute demos, one at 10am and the other at 1pm. All you have to do is bring out

some rockets to fly and display, and help with loading and recovering the rockets. Then you get to watch the show from up close. If you can help out, give Bob Wiersbe a call at 630-690-5442. You'll have a good time!

Next and best, there's the Midwest Regional Fun Fly on June 14 & 15. This is the primo NIRA event of the year, and should not be missed. If you're new to the club this is a 2 day sport launch combined with evening activities, BBQ, raffle, and fun contests. This is the 7th year we've held MRFF, and each year it just keeps getting better! If you haven't received a registration packet in the mail, contact Ric Gaff at 630-483-2468. Don't Miss MRFF!!!

There is a two day HPR launch at Bong Recreation Area sponsored by Tripoli Wisconsin scheduled for June 21 & 22. Finally, the CIA is hosting a HPR launch at the Rantoul Aviation Center on June 28th. That's 7 straight weekends of launches within a few hours drive! You can't complain about not having opportunities to fly this year!

The date has been set for the Eat Cheese or Fly launch. This is NIRA's annual High Power Launch held at Bong (there's that name again! If you're planning to attend 2 or more launches at Bong, just buy the yearly pass). It will be held on August 9th, starting at about 10am and going until 5pm. Look for more details next issue.

So, what can you do if you can't make it to Muncie on May 17? How about a trip to Sheboygan, Wisconsin to watch a couple of Loki-Darts get launched? The Wisconsin Rocketry For Schools program is sponsoring this launch, which will include altitude attempts, ATV (Amateur Television) payloads, along with other student payloads and HPR launches. The fun starts at 9am and runs until 4:30pm. If the weather is bad on Saturday, the launch will be held on Sunday. For more information, check out:

<http://earthlab.meteor/wisc.edu/~rockets/>

Finally, I need to correct some mis-information from the last issue. First, the Unclassified Ad was completely wrong and was not meant to be printed. Second, I've learned that the Estes Memo

was indeed a fake and apologize for the error (however, a former Estes employee is in the area now, and we might be able to get some of the inside dirt scoop out of him). Last, there was no interview with Mark Bundick.

## SMURFF I Launch

Date: May 17-18, 9-6 each day

Site: AMA National Flying Site

5151 East Memorial Drive

Muncie, IN

Waiver: 8,000 MSL (approx 7,000 AGL)

Fees: \$6 per flyer per day, or \$10 for both days; 12 and under free with paid adult.

Contact: Ned Blumenschein

3428 Kewatin CT

Ft. Wayne, IN 46815

219-749-0006

FAX: 219-482-9784

email: 10217.3164@compuserve.com

Hotel: Amerihost Inn, 765-282-0600, tell them you're with "SMURFF-AMA" when making reservations

Alternate Hotels (if Amerihost is booked):

Lees Inn - 765-282-7557 Days Inn - 765-288-2311 Signature Inn - 765-284-4200 Comfort Inn - 765-282-6666 Super 8 - 765-286-4333

Camping with no hook ups available at the AMA site.

## 14AL-97 (One For All (Nienast))

Wisconsin Organization Of Spacemodeling Hobbyists (WOOSH) is holding a NAR sanctioned Open Meet. The date is May 31st, 1997, starting time is 10am. Rain date is June 21st. To be held at Bong State Rec. Area, Burlington, WI.

Events will be: 1/2A Streamer Duration, C Eggloft Altitude, Random Duration, Open Spot Landing, and Sport Scale.

There will also be a fun event - People's choice Classic Kit.

For more information, contact Steven Koszuta at (414) 481-6341 or Dan Wolf at (414) 328-5193.

# T MINUS 1 - NIRA'S CALENDAR OF UPCOMING EVENTS

## 1997 CLUB LAUNCH DATES

Launches are BYOL (bring your own launcher). The location for our 1997 launches is unknown at this time. If you have questions prior to any launch, call the NIRA hotline at (630) 690-6353 and leave a message, I will call you back.

**May 25 - Club Launch at Harvard Site, 12-5pm.** We've moved the May launch to the 25th since most of the core members are going to Muncie, Indiana for a sport launch there. Please call the Hotline for up-to-date information. Note the time change too, please!

**June 7 - Moosechart Demo.** Contact Bob Wiersbe (630-690-5442) if you'd like to help out. Volunteers are needed!

### June 14 & 15 - Midwest Regional Fun Fly !

July 20 - Regular club launch. Site and time to be determined.

**August 9 - Eat Cheese or Fly (ECOF).** Bong Recreation Area, WI. 10am-5pm.

August 17, September 21, October 19, November 16 - Regular Club Launches. Site and time to be determined.

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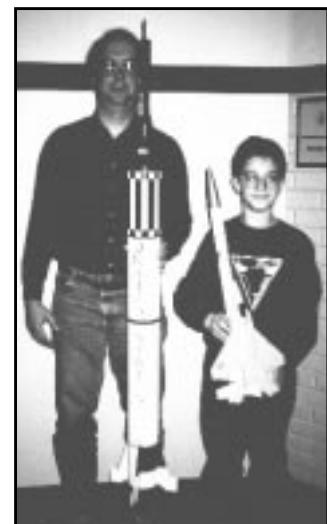
## Model of the Month Winners

I have no idea what months these photos are from, so I beg your forgiveness.

Left: Pierre Miller's scratch built Saturn 1B took Youth, and Joe Nowak's Tomcat took adult.

Center: Ric Gaff's scratch built Nike-Cajun(?) won Adult, and Matthew Duckworth's Phoenix won in Youth.

Right: Joe Nowak's really cool Boyce Mercury-Redstone was the hands-down winner in Adult, and Mark Soppet's nicely done F22 won in Youth. Congratulations to all the winners!



## MONTHLY MEETINGS

All meetings start at 7:30 PM, and include refreshments, entertainment and a brief business meeting. Don't forget a model for "Model of the Month" voting. We need volunteer speakers to entertain the troops after the business meeting, so call Bob Wiersbe at (630) 690-5442 if you can help with ideas or can speak yourself.

Currently schedule meeting dates are: June 6, July 11, August 1, September 5, October 3, November 7, December 5.

**Please note that the July club meeting is on the 11th!!!**

**THE LEADING EDGE**, published bimonthly by and for members of the Northern Illinois Rocketry Association, NIRA, NAR Section #117, is dedicated to the idea that Sport Rocketry is FUN! Articles, plans, photos, other newsletters, and news items of interest should be sent to Bob Wiersbe, 1835 Shetland Drive, Wheaton, IL 60187 (or electronically via Internet to r.e.wiersbe@lucent.com). Photos will be returned, other material returned if requested. Send membership applications (dues: \$3/year, including a six issue subscription to the Leading Edge) and nonmember subscriptions (\$5 per six issues) to Ken Hutchinson, 84 Jefferson Lane, Cary, IL 60013. Any item appearing in the Leading Edge may be reprinted by Sport Rocketry with proper credit given; all other uses require written permission of the Northern Illinois Rocketry Association. Better not take a dog on the space shuttle, because if he sticks his head out when you're coming home, his face might burn up. -- Deep Thoughts, by Jack Handey

## Other Items of Interest

May 17 - Loki-Dart launches in Sheboygan, WI.

May 17 & 18 - SMURFF I, Muncie, IN.

May 31 - HPR launch at Bong. Contact Dave Sutton (414-886-6017) for information.

June 21 & 22 - HPR launch at Bong. Contact Dave Sutton (414-886-6017) for information.

June 28 - HPR launch, Rantoul Aviation Center, 10am. Contact Greg Smith (217) 352-9655 for more information.

July 19 - HPR launch at Bong. Contact Dave Sutton (414-886-6017) for information.

August 16 & 17 - HPR launch at Bong. Contact Dave Sutton (414-886-6017) for information.

## Solving Chute Problems by Guy Garnett NAR #59065 Sr

Plastic 'chutes, whether made out of plastic grocery bags, leaf bags, dry cleaning bags (a popular source at one time), or the Estes plastic 'chutes, or even the silvered mylar ('space blanket' or emergency thermal blanket, 6 sq ft for under \$3 at most camping and surplus stores, and easy to see, too!) need a little care to operate reliably. I'm sure some folks will disagree with some of the details of this, but I've had relatively reliable chute deployment; this works for me.

First off, get snap swivels or swivel hooks for all of your 'chutes. You don't have to pay Estes' inflated prices for inferior hooks, either. Go down to your local sporting goods store, and browse around in the fishing supplies section 'till you find some snap swivels that are right. You'll get twice as many for half the price from this source. I use three different sizes, depending on the size of the 'chute, and I look for the kind that won't pull out easily (when you see on, you'll know what I mean).

Second, don't store the 'chutes packed in the rocket. Unsnap them, untangle the lines, and store them spread out flat. The plastic, particularly the kind that Estes uses, tends to have a 'memory' of how it's stored, and tends to stay in that shape. Store it all packed up, and it won't unfold as easily.

Lastly, keep the 'chutes well dusted. I use baby powder (talcum powder). You don't need a lot; the idea is to keep all of the plastic surfaces coated with powder so that the 'chute doesn't stick to itself. You do need to make sure to coat the whole 'chute. It's most easily done at the workbench - lay the 'chute out flat, sprinkle it with powder, and spread it around with your fingers. I do this when I'm putting the 'chutes away after flying.

The night before flying days, I go over all my equipment. This is when I make sure the range box is packed, and I have everything I need. I also pack my 'chutes, and store them in compartments in my engine box (I use a Plano plastic fishing tackle box to store engines, igniters, and recovery systems, and an ancient steel fishing tackle box for my range box/toolkit). I also fold and roll streamers at this time, and generally load up all of my gear into the range boxes.

Before packing the 'chutes, I do a quick inspection, and dust them on the inside with a little extra talcum powder (can't hurt, after all). To pack the 'chute, I hold it by the tip, and stretch out the shroud lines, pulling the whole thing into a point or arrowhead shape. I fold over the ends of the lobes (away from the shroud lines) to make it more compact, and then fold the 'chute lengthwise once (in half, so the tip meets the shroud attachment points), or twice (a 'Z' shaped fold, so that the chute has two folds, and

the tip is away from the shroud attachment points) depending on the size of the 'chute. I roll it (loosely) to make a package that will fit in the compartment easily, and wrap the shroud lines around it in a spiral.

For BT-55 or larger rockets, or small 'chutes and BT-50 rockets, this package will fit in as-is. If I need to pack a 'chute for a smaller rocket, I'll re-roll and re-wrap the 'chute on the field as I prep the rocket. Although it's only overnight, I don't like to store the 'chutes tightly wrapped. I generally don't even try to put 'chutes in BT-5 rockets (competition being the only exception to this that I can think of).

I've been using Quest wadding, and when I prep the rocket, I take one square of the wadding material, and fold it around the 'chute bundle, making a little fireproof package for the 'chute. This has really cut down on the incidence of burned 'chutes, particularly the annoying little charred pinholes that I always used to get. I'm a little less pleased with the Quest wadding for packing in the body tube, although I've no real complaints either. (My favorite body-tube wadding material was the old Centuri fireproof cotton (?) material, rather than the treated toilet paper [Estes] or tissue paper [Quest] that's available now).

I generally repack and refly each 'chute a couple of times during an average flying day. When I repack, I liberally dust with talcum powder and refold the 'chute the same way I do on the workbench. It \*is\* possible to get good performance out of plastic.

### Primer Comparison/Test by Pierre Miller

While building a Mercury-Atlas, a thought popped into my head that had to be answered. How would I finish the thing? I remembered my first rocket, how I hadn't filled the wood grain or body tube seam. When I painted it silver every flaw showed up. Wood grain, tube seams, scratches, mold lines, glue drippings, the works.

This is why I think gray colored primers work so well. They are very similar in color to silver, but they don't bring out the flaws quite as well. The reason for this is that the primer is "flat", while silver paint is "gloss". Gloss paint will show all the flaws that occurred before painting, while flat paint shows all the flaws that occur after painting.

I ran some tests on three different primers to see how they compared to each other, and how well they covered. The test vehicle was a piece of sealed balsa glued to a section of body tube. The primers I tested were Testor's Model Master gray primer, K-Mart Primer, and just plain old sanding sealer. For the paint I used Testor's Model Master Buffable Metalizer Aluminum plate lacquer.

Just sanding sealer. This one lived up to my expectations. It filled everything very nicely, and covered everything as well. The main drawbacks were that it required 4 coats to fill, and it took about 2-3 hours for each coat to dry. It sands easily with 220 grit sandpaper, but it becomes harder to sand as the grit goes up. With the paint on it looked nice, but scratches could occur if you don't care to go over it with fine sandpaper (1500+). Your results will probably vary, as I have been using a sanding sealer from True Value (\$7.00 a quart).

K-Mart Primer. I have used this stuff as a primer before. It did the job as a primer, but took a lot of coats to do the job. As for sandability, when I used 500 grit wet sandpaper, I went right through the primer after 2 strokes. It is very good stuff for its price (\$.99), but not the best. It took about 3 or 4 coats to get it thick enough to sand generously, but altogether it did a good job. It is more of a primer that prepares the surface for painting than a scratch filler, I would use sanding sealer first followed by this primer. Its covering power is nice, it dries fairly fast (10-12 minutes) and can be sanded in about 30 minutes.

Model Master gray primer. I've save the best for last. This is the best primer that I've tried yet. It covers very quickly, fills scratches, dents, and seams very nicely. It sands quickly with 320-500 grit wet sandpaper. However, it clogs sandpaper of finer than 600 grit quickly, so keep a hobby knife and a bowl of water handy. It was meant to be airbrushed on, but you can do the job with a plain old brush. I recommend you thin it to airbrushing consistency anyway, even if you are brushing it on.

My favorite characteristic of this primer is that it is glossy when dry. It was shiny, and felt so smooth I thought it was just a really good paint. It helped the paint adhesion and 'deepened' the tone of the metalizer paint. Because it is so dark, you may have trouble covering it with lighter colors. This primer is not the cheapest, over 30 times the price of the K-Mart stuff (\$1.80 per 1/2 ounce). You can stretch it a bit by thinning it.

In conclusion, whatever you do, whatever you use, prime before you paint. Experiment for yourself to see what works best for you. And if you learn something in the process be sure to pass it along.

### From a Launching Far, Far Away by Adam Elliott

NIRA launches used to be much closer. On my block to be exact. Practically in my back yard. But due to powers beyond our control the local park district has decided that we will not be able to use their "public" park any longer.

So after a frantic search we have located a field just north of Harvard, IL, which is much closer to where I USED to live. It is a sod farm out in the country. Nobody had set a definite time for the launch so I assumed 2pm would be a good time. On the road at noon we arrived at 2. It was raining all the way (not as good sign). Some people had been there since ten. Bob Kaplow asked if it was worth the drive and it almost was! It was almost as huge as NARAM-38 and had much better terrain (i.e. flat).

Naturally this was all a call for bigger motors. I kicked off the year with some D's in some of the rockets Jonathan sold me. They worked great. Then I decided it was time to get rid of the D21's that had crying to be launched. First was the Optima with a D21-4. Something didn't work because it pranged forming a "gravity well" in the ground. So then in disgust I launched a Cherokee-D on a D21. A streamer should have been used because the parachute carried the thing way too far. That was after it screamed off the pad and nearly went sonic of course.

Tom Pastrick had his model of the month, the Eight Foot, Ten and a Half Inch rocket and it flew great. It spun around its long axis like crazy as well. If you squint you can see toenails flying in all directions.

Some guy from Elgin showed up with his Astro-Cam with no film which was good because of the clouds.

There were some disasters however. One of the Swikowski's had a reloadable malfunction when it set the whole bird on fire, wadding and all. It fell to the earth in an awesome fireball. Tom Pastrick had an unfortunate CATO in his R2-D2. Somebody said something about lending circuits. Bob Kaplow successfully launched his Bunny Killer for a change. Not many if any were lost on this day because of the size of our site but Bob answered the call. He stuffed an F7 in his Waci, a Maniac derivative, and it disappeared for good.

John Barrett was again the launching champ with 25 flights for the day. The Guzik and Swikowski clans each put up a ridiculous number of rockets as well. Pierre Miller launched a lot, and I put up eleven in just three hours. All in all the club put up about 192 flights on our first yearly launch with only about 30 fliers or so.

My cousins own a pizza restaurant in Harvard. They are closed on Sunday. So we went to a place in Big Foot just up the street. I'm not a guy to say bad things but it seemed all their good staff members were off that day.

Rumor has it that we will indeed be launching up there again which will be good for the bigger motor people. And the Mosquito people too. This is actually a great place. Maybe my cousin's place will be open too.

## My Summer Vacation at the Kennedy Space Center

by Steve Smith

My wife Kimberly and I recently returned from our trip to Walt Disney World. We were down there from 4/19/97 through 4/26/97. What trip to central Florida would be complete without a visit to the Kennedy Space Center (KSC)?

About two months prior to our trip, I learned the Air Force would be launching an Atlas I rocket to place the GOES-K (Geostationary Operational Environmental Satellite - Model K) weather satellite into orbit Thursday (4/24) morning from the Cape Canaveral Air Station (CCAS). The launch window was from 1:50 AM to 3:19 AM on Thursday. Even though most sane people are sleeping at this time, we weren't going to miss this.



We determined that we would go to the KSC on Wednesday (4/23) not only to visit the KSC itself but to obtain any last minute information about the launch.

Wednesday came and we arrived at the KSC at about 10:00 AM under overcast skies. We stopped at the information desk to get a map, and buy our tickets for the IMAX movie 'The Dream is Alive' as well as the KSC bus tour. 'The Dream is Alive' is an incredible IMAX movie (as if any of the other ones aren't). From what I was able to determine from the movie, the footage was taken from onboard STS-41 and is truly spectacular. A MUST see if you ever get the chance. Upon leaving the movie, the overcast skies had opened up and it was raining pretty steadily. Kimberly remembered to pack the umbrellas (I'll tell you, I have one great wife) so we didn't get too wet.

Our next stop, the KSC bus tour. We boarded the bus and headed off to the Vehicle Assembly Building. The VAB is a behemoth of a building, each star in the American flag painted on the side of the building for the Bicentennial measure 6 feet across to give you some perspective. Just as we were rounding the VAB getting ready to head to the launch complex the torrential

rains and winds came. It was so windy they had to stop the tour and park the buses in the VAB parking lot for 45 minutes. After the winds had subsided we drove to pad 39-A and 39-B. The bus tour route parallels the "road" that the crawlers use to take the shuttles out to the pads. Instead of being a paved road that we are accustomed to, it is "paved" with plain old river rock. A normally paved surface (asphalt or concrete) wouldn't be able to withstand the weight of the crawler, shuttle, external tank, and solid rocket boosters. It's amazing to see 2-3" rocks literally reduced to sand. We finally arrived at the pads and even though you view these from approximately 1/4 of a mile, you can't help but be amazed at the complexity and size of the structures. Pad 39-A is the only one of the two that is currently operational, pad 39-B is being refurbished.

After completing the tour of the launch complex the bus took us to the Apollo/Saturn V center. Upon arrival you are placed in a room in which you view a movie about the Apollo program. You are then ushered into the firing control room. In it are several banks of consoles used during the Apollo missions and are lit up during an audio/visual presentation of the launching of Apollo 8 (Borman, Anders, and Lovell's mission around the moon). The effects, including 3 large screens and the actual launch sequence, were so amazing it felt like you were really there. After the presentation it was off to the Saturn V exhibit hall where they have a FULL SCALE Saturn V rocket, WOW!!! Talk about a kid in a candy store, my jaw still hurts from when it hit the ground. Words cannot describe just how big it is. (Hey Bob if we put enough weight in the nose I'll bet we can fly it at MRFF. I can guarantee it would be the best attended launch in NAR history :)) The neat thing about the display is the fact that the rocket is separated into each of its separate stages giving you the opportunity to view the engines for each stage.

We finally boarded the bus to head back to the KSC visitors center. Though the winds had died down it was still raining pretty good. This fact unfortunately closed the space shuttle they have on display, the catwalk used to enter it is made of steel and they didn't want us to get hit by lightning. Hey we would have taken our chances. We passed the astronaut memorial on our way back from the shuttle exhibit. The memorial contains the names of the astronauts that have died while performing their duties. It follows the sun so you can read the names of the astronauts as the light passes through their names, a very sobering sight. Even though it was raining I wasn't going to let it stop me from taking pictures of some of the rockets in the rocket garden, though I don't know how well they are going to turn out.

We decided it was finally time to head out but

before we left, Kimberly stopped at the front desk to get more information about the Atlas I launch. She got the number for the public relations office at the Cape Canaveral Air Station since it was the Air Force and not NASA launching the rocket. On our way back to Disney we thought it would be a good idea to go down to the CCAS to map out our strategy during the daylight hours versus at 1:15 in the morning. We stopped at the guard station and asked him if the launch was still scheduled, which he said it was, and where we could view the launch from. There is a series of bleachers right outside the guard station from which the public can view not only launches from the CCAS but from the KSC as well. The bleachers put you about 7 miles from the pads at the CCAS and about 20 miles from the pads at the KSC. Finally, armed with all of the latest information we could get, we headed back to our hotel at Disney.

After some much needed rest, we got up at 11:40 PM at which time I went outside to take a look at the weather. The moon and stars were shining so we decided to hit the road even though attempts to call the public relations number were unsuccessful. We arrived at the CCAS at about 1:15 AM on Thursday morning and upon noticing that there were no other cars in the public viewing area we drove to the guard station to inquire about the status of the launch. It was not the news we wanted to hear. Even though the skies had cleared the winds were still too strong to attempt the launch. The guard said the launch was rescheduled for 1:49 AM on Friday (4/25). On our way back, we decided to try again on Friday.

We woke up early Thursday morning and I called to public relations number at 7:45 AM, alas, somebody answered. I was told that the launch status was a go and there was only a 10% chance that the launch would be scrubbed. I was also given the number to Florida Today (a news service dedicated to covering the goings on at the Space Coast, <http://www.flatoday.com>, a cool site you should check out). The day seemed to drag on but finally the time arrived, only this time I was armed with a number to call. We got up again at 11:40 PM and I called the Florida Today hot-line number and the recording told me the launch was still on :-) We hit the road and got to the CCAS at about 1:15 AM again. Kimberly was getting her camera equipment ready when a car pulled up next to ours. I didn't pay much attention to it thinking that it was another spectator to watch the launch. However, when he offered a car pass to view the launch from the VIP viewing location on the base itself, I knew he wasn't just another spectator. There was only one other couple in the parking lot and they didn't want to go (the lady was sitting on the hood of their car wrapped in a blanket and looked VERY sleepy) so we graciously took the pass, hopped back

into our car and headed for the guard station. The guard waved us through and we were on our way to the VIP viewing area. We could see the Atlas, which was lit up like a candle, in the distance and as we drove it kept getting closer and closer and closer. We got to the VIP viewing area (which was 3 miles from the pad) at about 1:30 AM giving us about 20 minutes to get to the bleachers and have Kimberly set up her camera. It was impressive, 4 large sets of bleachers, a tent with food and beverages, people with VIP badges on, and Lockheed Martin signs everywhere. We took our place in the stands which Kimberly decided were too shaky to get any good shots, so we set up the camera at the rope line. We heard the entire launch sequence over the PA system (Ric, NIRA's PA is better ;)) including the system checks followed by all of the "go's" just like in the historical footage you have seen. Then it came, 10, 9, 8, ... , Launch and finally a bright orange glow where the Atlas once appeared. We watched it climb higher and higher and go faster and faster. I had my binoculars with me and saw the Atlas booster separation through them, a neat sight. We watched it until it disappeared into the night, err morning sky.



Luckily, a rocket of this size doesn't exactly leave the pad like an Estes' Yellow Jacket so it gives you an opportunity to take several pictures even without an autowinder. We forgot the 2X converter for Kimberly's camera at home so she only had a 210mm zoom lens to work with, but I think the pictures still turned out great.

On our way back to the car we passed through the tent where I saw a bunch of people carrying booklets titled 'AC-79 GOES-K Mission Overview'. I went up to a guy who had a stack of them and asked him where he got them from and he just handed me one. It is an excellent booklet and I would be willing to make copies for anyone who is interested.

I know this wasn't a shuttle launch but it was truly spectacular none the less. If you EVER get an opportunity to see any type of professional

launch, by all means do so. Don't let the time of a launch dissuade you from attending. You might think we were tired attending a launch at 1:49 in the morning, but I can assure you we weren't in the least bit, plus the memories of our fun little adventure in the wee hours of the morning on the east coast of Florida will last a lifetime.

### NARAM Contest Ruling

Here is a CIS post from NARAM 39 Contest Director, Steve Lubliner, regarding interpretations that have been made regarding Pink Book rules for the events that will be held. Questions (and complaints) regarding them are best emailed to him at [103056.621@compuserve.com](mailto:103056.621@compuserve.com). This information has also been placed on the Events page of the NARAM 39 web site - <http://www.primenet.com/~tmorgan/naram39/> - along with various other updates.

#### 6 "C" Cluster Rules

To : All

From : Stephen M. Lubliner

The following is the interpretation of the 6 "C" Cluster Altitude rules to be used at NARAM 39 this year. The interpretations have been submitted to Tom Lyon of the Contest and Records Committee. Tom has concurred with these interpretations.

#### Ruling:

The modeler must make a "good" faith attempt to ignite all of the motors.

#### Discussion:

The event is "cluster" altitude which implies that all motors must function in the cluster. This statement is being made because it has been suggested that some or up to 5 of the motors be carried in tandem as payload to minimize frontal area. A "good faith" effort for motor ignition will be ignition provisions (e.g. ignitors, thermalite) in each motor during model check-in.

#### Ruling:

All motors must remain in a continuous piece of model structure.

#### Discussion:

It has been suggested that motors may be separated from the model as long as they are contained within a part of the model structure (refer to section 22.3 "all motor cases are to be retained in the model"). I believe that separating spent motors from the model constitutes a form of staging. Since this event is "cluster" altitude the ruling is that a cluster constitutes all motors being installed in a continuous piece of structure. Note that this interpretation does not preclude the use of boosted darts nor does it prohibit separation of the model into 2 or more parts for recovery.

Ruling:

Airstarting per rule 23.6 will be permitted.

Discussion:

There is some concern about airstarting relative to the use of thermalite. The safety concern is that pieces of burning thermalite may separate from the model and subsequently start a grass fire. We intend to take special precautions, mostly in the form of increased vigilance for field conditions to preclude the possibility of fire. The bigger issue is the availability of thermalite and its legal possession (regarding Low Explosive User Permits, LEUP's). Our policy for "C" and "Team" Divisions will be "don't ask, don't tell". The logic is that we are not a police force. Thermalite will be banned in "A" and "B" Divisions because the participants are too young to apply for a LEUP.

Ruling:

Flash pan ignition will not be permitted.

Discussion:

There has been some discussion about using flash pan ignition for the cluster event. My understanding, based on discussions with other modelers, is that flash pan ignition works and does not require a large amount of black powder. On the other hand, it will be very difficult for the range safety team at NARAM 39 to assure that the contestants do not use excessive amounts of black powder. A fire concern exists from either wind blowing black powder around the launch site or from the motor exhaust blowing burning black powder away. A concern that the black powder can ignite the model is also present. The NARAM launch system is capable of igniting 6 Estes solar ignitors. The solar ignitors and other reliable methods of motor ignition exist without relying on flash pan ignition.

Stephen Lubliner

NARAM 39 Contest Director

### 6 Cluster Motor Model General Construction Notes By Tim Van Milligan

The six "C" motor cluster altitude event at NARAM looks to be very interesting. Many people have been chewing over how to make the model, so I've created some neat paper shrouds that would work to minimize drag and weight. The shrouds; for the 18mm dia. side pods, blend into the core tube of the model. They are oblique cones, and the imaginary point of the cone would be inside the model. Because of this, you could use them to vent the ejection charge of the "pod" motors into the core tube of the model.

The 5 piece shroud pattern set also includes a tube marking guide for the 18mm core tube. This marking guide has the vent ports cut-outs

on it; if you choose to vent the ejection charge internally.

The model shown on the patterns is incomplete. It doesn't say anything about the length of the model nor the external motor pods. This is left up to the modeler to design their own stable model. What I wanted to contribute was the hardest part of the model; the blended nose fairings.

Making the blended fairing pods is hard. I would rank this as a skill level 4 project. But the advantages of the fairings may make it worth it. For starters, they reduce the drag of the model by keeping the frontal area low. Second, since the fairing are made out of paper, they are light weight, which should also increase the altitude of the rocket. Finally, the completed model looks really neat; you'll get lots of compliments from others about the design.

Here are some suggestions that I have that may make assembly easier. The material of choice is light weight card stock; i.e., index paper. Take the patterns down to a local photocopy center and manually insert the heavier paper into the bypass to transfer the patterns. The exception is the tube marking guide. For it, use regular 20 lb bond paper.

First, cut all the pod tubes to the desired length. DO NOT glue them to the core tube until you have glued the cones to the top of the individual tubes. Before you start any assembly, you should draw two lines on exact opposite sides of the pod tubes to aid in aligning the parts during assembly. I leave this up to you to do.

Cut the individual patterns from the sheet using a sharp hobby knife. The first step is to carefully roll the parts into a cone shape. The lines on the patterns indicate the direction toward the imaginary point of the cone - so use them as a guide. I'd start by rolling the paper around the handle of a hobby knife. Then use a 1/8 inch diameter wood dowel to curve the "point" of the cone. Do some testing of the cone to see how the glue tab lines up with the rest of the cone.

Next apply a very small amount of glue to the tab section, and glue the ends together. I'd do all the cones at the same time before gluing them to the tubes.

To glue the cones to the tops of the pod tubes, you need a lip on the tube to keep the edges aligned properly. For this, I'd use a 18mm centering ring or tube coupler. If you are worried about weight, you can peel out the inner layers of paper from the centering ring. Glue the ring into the top of the tube, but let it extend out the end by 1/32 inch (about 1 mm). Now test fit the cone on the tube.

Before you glue the cone to the tube, lay the pod tube next to the core tube, and align it so that one of the pencil lines on the pod tube is against the core tube; try to be as exact as possible. To hold it in place, use tape. DO NOT glue them together. Now test fit the cone to the top of the pod tube. Reposition it as necessary so that the cone mates correctly with the core tube, and the pencil line on the tube aligns with the centerline of the cone. Make sure there are no gaps where the cone intersects the core tube. Remove the cone,

apply the glue (use wood glue, not CyA), and re-fit the cone. At this point, you are gluing the cone to the top of the pod tube, and not to the core tube. After the glue has set, remove the tape holding the two tubes together, and set the pod tube aside until the glue has dried. Now repeat the procedure for the other tubes.

If you want to have the pods vent their ejection charges into the core tube, you'll have to cut the openings into the core tube. The tube marking guide has the correct sizes for the cut-outs, but you must cut inside the perimeter by 1/32 inch so that the edges of the cone have something to glue against. NOTE: It may or may not be advantageous to have the tubes vent into the core tube; this is for you to decide!

Using the tube marking guide is fairly straight forward, so I won't go into it. If you want to have the vent ports, you'll have to position the marking guide so the bottom edge is at the top edge of the pod tube location. Draw a line around the perimeter of the rocket at this point to make sure you line all the tubes up correctly when you go to glue them on. If you decide, cut out the vent ports as indicated.

Gluing the pods to the rocket is a hard and tedious task. Start by placing a line of glue around the mating surface of the nose cone. To speed assembly, I put one small drop of CyA glue on the aft end of the pod tube. This will hold the pod on the centerline of the rocket while you fuss and reposition the cone to mate with the core tube.

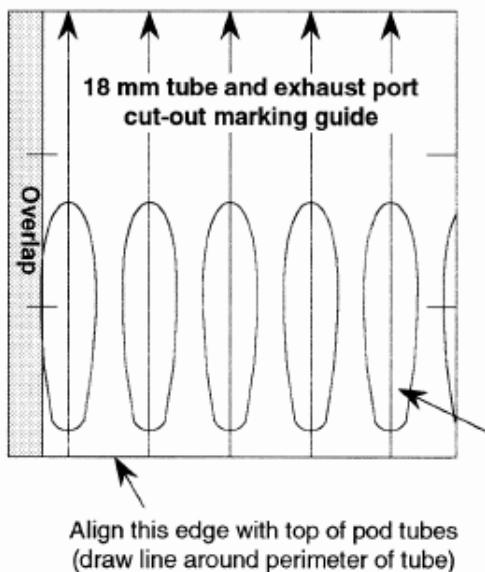
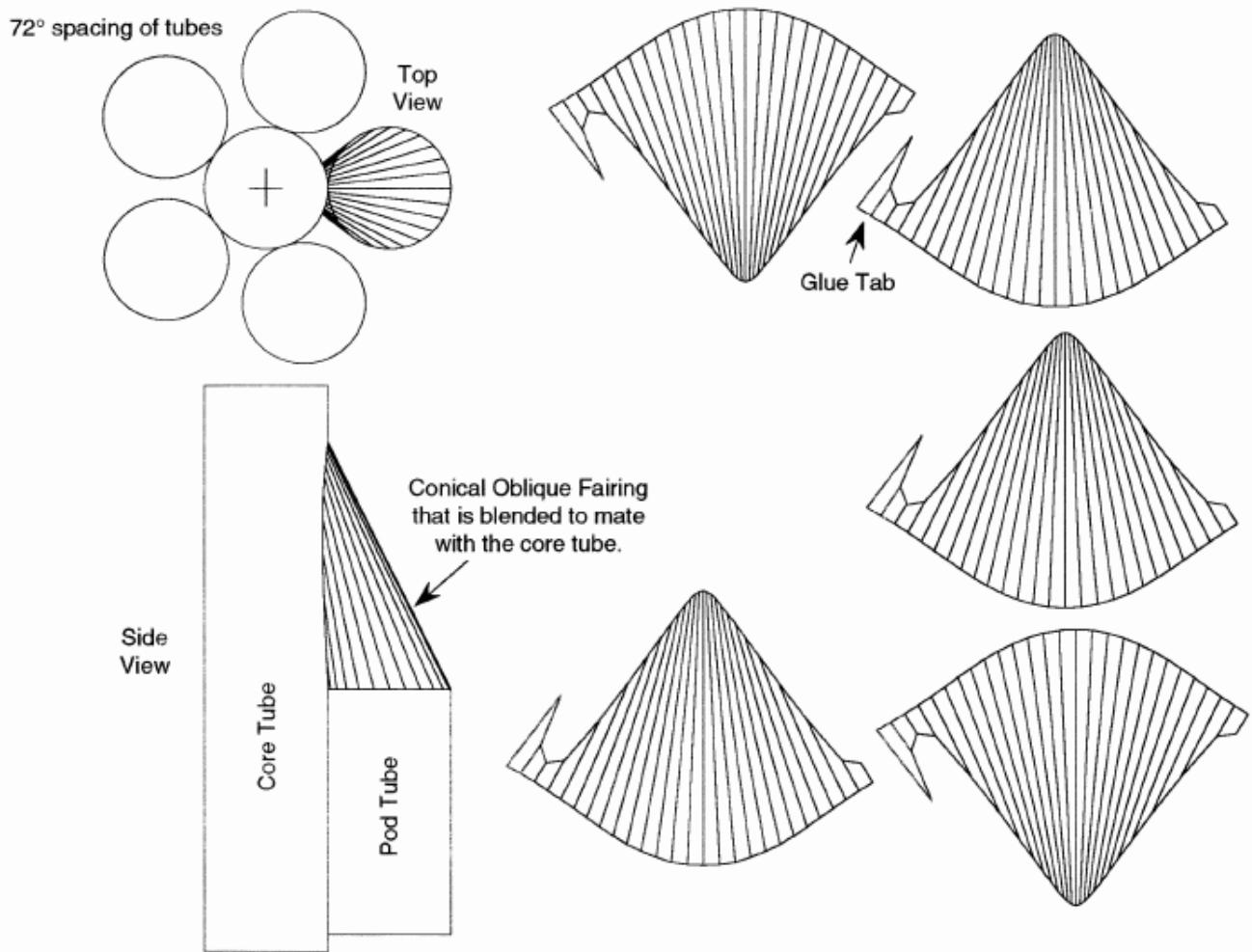
Once the glue on the cone has fully set, you can run a bead of glue along the joint between the two tubes to hold them together. Then run another thin fillet of glue around the perimeter of the nose cone where it intersects the core tube. This will fill any small gaps. Allow the glue to set before starting the next tube.

After you have all the tubes in place, you can add your fins. You have two choices for locating them. You can go either between the tubes, or on the outside of the pod tubes. If you go between the tubes, it will provide additional strength. If you decide for the outside of the pod tubes, it will be more efficient, and less fin area (and weight) will be added to the rocket. But it is your design, so you can make a decision.

Note: The 6-C cluster altitude event is not included as part of the \$500 Apogee Challenge contest.

For a catalog of products from Apogee Components, send \$1 to:

Apogee Components, Inc.  
1431 Territory Trail  
Colorado Springs, CO 80919-3323  
USA



## 6 Cluster Motor Model Rocket Using a Conical Oblique Fairing that is Blended to Mate with the Core Tube.

Fairing Designed by Tim Van Milligan 2-20-97

If you enjoyed the paper fairings in this model, try out the "Designer's Resource Pak" from Apogee Components. It has a lot of different shapes you can use to create your own unique model rockets.

Optional Vent ports --  
**Important:** cut out inside the perimeter of the lines by 1/32 inch.

For a catalog of products from Apogee Components, send \$1 to:

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 1431 Territory Trail  
 Colorado Springs, CO 80919-3323  
 USA

## **Confused Stages**

**by Jonathan Charbonneau**

Have you ever been confused about how many stages a particular rocket has? Wondered if a fully stacked, fully operational Delta II is NAR legal?

Sooner or later you will undoubtedly have a question about some rocket in regard to how many stages it has, because it isn't one of the more common configurations. And, you've been told that a model rocket design can have a maximum of three operable stages. This article should answer your questions on how many stages a rocket has, no matter what the configuration is.

First, I'll give a description of each fundamental configuration in rocketry followed by its number of stages under NAR rules.

The first configuration is the single stage, and as the name implies, there is only one stage. If you already know this one, you may go on to the next paragraph. A single stage vehicle does not make any configuration changes until recovery system deployment. A configuration change means that none of the vehicle is separated. The Estes Alpha III is an example of a single stage rocket.

The second configuration is the series stager, where the stages are stacked on top of each other. In this configuration the bottom engine is ignited first, when it burns out the engine in the next stage is ignited and the first stage separates from the rest of the vehicle. A series stager has  $N$  stages, where  $N$  is the number of engines stacked on top of each other. The Quest Zenith II and Estes Commanche 3 are examples of series staged rockets.

The third configuration is the cluster. This is when two or more engines are ignited at the same time. The cluster is still considered a single stage vehicle, since it does not undergo any configuration changes. The Estes Maxi Force and Custom Rockets Land Viper are good examples of clustered rockets.

The fourth configuration is the parallel stager. This is a variant of the cluster in which the outboard engines (boosters) are deliberately selected to have a shorter burn time than the core (center) engine (sustainer). They are also placed in a set of external pods or skirt that is designed to fall away from the rocket when the booster engines burn out. The parallel stager is considered a two stage vehicle because the boosters are dropped off when they have burned out (configuration change). The real Space Shuttle and Titan IIIE are examples of a parallel staged vehicles, but there are few parallel staged model rocket kits.

The fifth configuration is the complex cluster. This looks just like a regular cluster, however, not all engines are ignited at the same time. The

other motors are "air started" when the first group burns out. An example of this would be an Estes Pro Series Patriot (a 4 engine cluster rocket) that takes off under the thrust of two motors and the other two are ignited after the first pair burns out. The complex cluster is still considered a single stage vehicle since no configuration changes were made.

The sixth configuration is the complex parallel stager. This is a parallel staged vehicle with two sets of boosters, called appropriately, primaries and secondaries. A complex parallel stager takes off with its primaries and sustainer all burning together. The secondaries are either pad started with the rest or air started at primary burnout. Regardless of when the secondaries are ignited, the primaries are the first to burn out and fall away. The secondaries burn out and fall away later. The sustainer (core) has the longest burn time, and burns out last. The type of complex parallel stager just described would be considered a three stage vehicle because both sets of boosters were dropped off at different times.

The seventh configuration is the salvo stager. This is a variant of the series stager. It has a set (salvo) of two or more sustainers atop the same booster. The salvo stager takes off as a unit, when the booster burns out the sustainers are all ignited simultaneously and fly their separate ways. The salvo stager is considered a two stage vehicle since the sustainers are fired at the same time after booster burnout, even though they operate independently of each other. The MIRV Gryphon by Seattle Rocketworks is an example of this type of vehicle.

The eighth and last configuration is the boosted dart. This has two parts, a booster, and a dart. The booster, as you would expect, has an engine. The dart is usually skinnier than the booster and is always heavier for its size than the booster. If you've guessed that the dart separates from the booster at burn out, you are correct. However, the dart is not a stage because it has no propulsion of its own. It flies unpowered after the booster burns out. The boosted dart is considered a single stage vehicle.

### **Summary**

The number of stages in each of the eight fundamental configurations is as follows: Single Stage - 1; Series Staged -  $N$ , where  $N$  is the number of stages (engines) stacked on top of each other; Cluster - 1; Parallel Staged - 2; Complex Cluster - 1; Complex Parallel Staged - 3; Salvo Staged - 2; Boosted Dart - 1.

### **Conclusion**

The number of stages is not difficult to determine, even on rockets that use a combination of two or more of the fundamental eight configurations. To determine the number of stages in any configuration, just tally up the number of times the rocket drops any parts containing burnt out

engines. Each of these times is one stage. If the final pre-recovery configuration has an engine, count that as a stage. Any groups of two or more pieces that are dropped at the same time are counted as one stage. Do not count parts containing only FX engines. Only engines that produce useful thrust are to be counted.

One final note: the 3 stage limit rule applies only in competition. It is perfectly legal to fly a rocket with more than 3 stages at a sport launch as long as: 1) you know what you're doing, 2) you're properly certified for the total impulse being used, 3) you've notified the FAA and/or secured a waiver if needed, and most important 4) you follow the NAR safety code.

## **Titan Museum**

**by Don Linder, Sr.**

**[reprinted from the Leading Edge V6,#5;  
those fortunate enough to be going to  
NARAM this year might get to see it]**

The Titan Missile Museum is located about 15 miles south of Tucson, Arizona near Green Valley. This is one of 18 complexes that were in the Tucson area, supported by Davis Monthan Air Force Base. Two other clusters of 18 complexes were at McConnell AFB, Kansas, and Little Rock, Arkansas. These were active from 1963 to 1984, at which time they were all deactivated and the missiles and warheads were removed. This complex is the only one that will be preserved; all the other 53 will be salvaged and destroyed. This one is being saved as a museum and as tribute to the service of the men and women who operated them. All complexes were identical, comprising the Titan Missile in its silo, a control room, generator and climate control, and quarters for the around the clock crew. All of the facility is underground, housed in steel and thick concrete, hardened against a near miss, to assure the capability of making a retaliatory second strike, thus removing the incentive of a first strike by an aggressor.

The tour starts with a video tape relating some of the history of the Titan Missile. Each person then dons a hard hat and is led out of the visitor center to the surface area for an inspection of the communication antennae, the sonar security system the rocket engines (removed from the missile before it was installed in the silo), a duplicate reentry vehicle, and the massive concrete cover of the underground silo.

This door is blocked half-open and half-closed. The reentry vehicle (nose cone) has a one foot square hole cut in the side, and the fuel tank has a similar hole. These measures presumably can be seen by satellite reconnaissance, and satisfy the other side that this missile does not count in the quotas established by the SALT Treaty. A low dome of plastic windows has been constructed over the half open silo and the Titan Missile (serial number 10) can be viewed. Mis-

sile number 10 was never fueled, having been taken directly off the assembly line to be used in training.

The tour then proceeds underground via the security entrance which requires several codes and recognition by the crew of anyone seeking entry. The security of the Titan complex was never breached. The crew quarters, control room, and generating and air conditioning are on the top, middle, and bottom levels of one structure. A long tunnel connects this area to the missile silo which has nine levels. The control room is much like that of a very small generating plant or other industrial control room. The decor is concrete, gray paint, pipes, and conduits. There were panels with dials, chart recorders, switches and controls. Most of it dealt with the electric generation, heating, air conditioning and communications. In case of emergency, the complex was able to be independent for a 30 day period.

From the control room we passed through the tunnel that was about seven feet wide and just over six feet high except in places (remember the hard hats). At the silo, you walk round on the third level and can see the missile through a window. Looking up at an angle through the window, the nose of the missile and the blue sky are visible.

The tour concludes by returning through the tunnel and climbing the 110 steps to the surface. The museum is staffed primarily by volunteers. The visitor center is a wooden structure which is to be replaced by a more permanent building as funds are generated.

### **Building & Flying the Estes Mercury Atlas by Manuel Mejia**

The Estes Mercury Atlas is one of the most complex kit rockets that have ever come on the market. I managed to pick one up for \$34 from a very friendly hobby shop and started work on it immediately. The first few steps detail the construction of the motor mount. This part of the building was straightforward.

The fun starts when one starts on the rocket body itself. Be sure to test the contact cement that you plan to use on all of the styrene parts. Apply the cement on a section of scrap styrene from the Engine Strouds & Equipment Pods vacuform Sheet and let it sit for 24 hours. If the plastic melts, DO NOT USE THIS CEMENT!!!! I basically ruined my Mercury Atlas by using a contact cement that basically softened and deformed a section of the first stage stiffener shroud. My model now has the appearance of having developed plastic cancer.

The rest of the plastic parts are now attached with a glue with RC-56 glue. Model airplane fliers use this glue to glue plastic windshields

onto their airplane models. The adhesive resembles white glue in color and lack of smell. I also dries to a bond that is strong enough to hold the plastic components to the rocket.

When cutting the moldings, be sure to use a gentle hand and take plenty of time. If you rush the job, you will cut the parts improperly and will have to use aluminized mylar to cover up your mistakes. The mylar is a rudimentary fix.

The instructions also leave out one important detail. When mounting the two separation rings, the mounting instructions do not tell you which side is up or down. In the middle of the ring, there is an indentation that is narrower on one side vs. the other. I had to compare the plastic part that goes on top of the separation ring so that I could find out which side was up. The narrow side must be facing the top of the rocket.

The rest of the Atlas booster assembly was ok. I did add a motor mount on each of the fin units so that I could fly the rocket as a cluster. Given the amount of work one has to put in in order to build this rocket, it is not surprising that most people would avoid this extra step. After all, why risk a rocket as expensive as this to cluster work? Since this rocket already has plastic cancer, I guess that it is uniquely qualified for this experiment. Be sure to plug the ends of the fin unit motor mounts so that the exhaust from the engines do not char the plastic equipment pods.

To save time, I used black monokote to color the adaptor skirt. I then used the aluminized mylar to detail the rest of the rocket. I choose to delete the installation of the escape tower since that particular item always break off after the first or second launch of any scale rocket that carries such a device. In any event, this particular rocket will never be entered into a scale event.

The Mercury capsule itself seems to be recycled from the old Estes Mercury Redstone kit. Regrettably, the mold may be showing its age. The capsule sections were warped badly enough that they did not fit together. I glued the pieces together as best I could using the old Redstone booster shoulder as a Jig to hold the three pieces together. The final product looks decent from a distance.

Since the plastic stiffener shroud was cancered to the point of being obnoxiously ugly, I decided to not apply the aluminized mylar strips to the booster. Makeup will only go so far. The booster was just spray-painted with Dutch Boy Aluminum. I also used a Testor's aluminum paint pen to color the LOX supply line and the two fuel lines that are molded to the adaptor skirt.

I have only flown the Mercury Atlas once on a single D12-3. The take-off is almost as slow and majestic as the real thing! I got a good deal of applause from the spectators who watched the launch. I now need to see how this rocket

works on a cluster. I will probably use Mini A10s as a start. One should add some 25 grams of clay to the Mercury capsule as a precaution if the rocketeer wants to fly the Mercury Atlas model on C motors. Even with all of the wonders and warts, the Estes Mercury Atlas is fun to build and to fly.

### **To Boldly Go Where No Chicken Has Gone Before Forwarded by Bob Kaplow**

Star Trek Answers the age old question - WHY DID THE CHICKEN CROSS THE ROAD?

Chakotay: Whatever its reason, whatever its goals, we should respect its right to cross the road and seek its own spiritual awareness.

Neelix: Actually, Captain, I'm not really familiar with the chickens in this system. But, if you can catch it, I can cook it.

Riker: I don't know why, but I know how: with pleasure, sir.

Worf: I don't know. KLINGON chickens do NOT cross roads.

HoloDoc: How should I know? No one tells me anything around here. I didn't even know we added chickens to the crew. All I know is that it would have been nice, BEFORE the chicken went off to the cross the road, if it had remembered to turn me off!

Dr. Crusher: If there's nothing wrong with the chicken, there must be something wrong with the universe.

Dr. Soran: His heart just wasn't in it. (Scenes of chicken torture with nanoprobe have been edited out.)

Scotty: Because she couldn't take much merrrrre.

Odo: I don't know, but I'm sure it must be Quark's fault.

Quark: Who, me?

Charlie X: Because it didn't want to STAY...STAY...STAY...

Troi: I feel the chicken's pain!

Kira: It was probably being chased by those cursed Cardassians.

Bones: Dammit, I'm a doctor, not an ornithologist!

Data: The chicken, in observing that it was on the opposite side of the 20th century Terran paved roadway, was aware that its immediate goal should have been to traverse the distance without interception by any kind of combustion-propelled personal transport vehicle, but I am unclear as to why any kind of domesticated fowl should desire to perambulate upon a conveyance normally reserved for the usage of...yes, sir.

The Borg: Crossing the road is irrelevant. The chicken will be assimilated.

Hugh the Borg: Maybe it just needed a big hug!

B'Elanna: I'm sure it felt suffocated by all the bleeping regulations of bleeping Starfleet and just couldn't stand it any longer!

Picard: There are four lights!

Q: Wouldn't you like to know? Too bad your puny human brain wouldn't be able to comprehend the answer.

Uhura: Shall I open hailing frequencies so you can ask it, sir?

Tasha: That depends...was it fully functional?

Chekov: It must have been on its way to assist in saving my life for the billionth time...did I scream this time?

Khan: With my last breath I spit at the chicken...

Harry: I don't know, it's my first mission.

Paris: Well, I think that...say, that's a lovely shirt you're wearing.

Harcourt Fenton Mudd: Chicken? I don't remember any chicken. No no no, there's been a terrible misunderstanding.

Janeway: Its primary goal was no doubt to get back to the Alpha quadrant...and it probably misses its dog.

Nurse Chapel: Oh, Spock!

Lwaxana: Oh, Jean-Luc!

Spock: Fascinating, Captain.

V'Ger: To join with the Creator.

The Grand Nagus: Stupid chicken! You don't cross the road all at once! You sneak across it quietly, without anyone noticing!

Gul Dukat: Well, that's a very interesting question...I'm sure we can work out some kind of arrangement to obtain that information that will be to everyone's satisfaction.

Kes: It was remembering back to the times when its ancestors crossed roads all the time! They lost those abilities because they stopped using them!

O'Brien: No problem, Commander, I'll get right on it.

Wesley: I'm not sure, but I can figure it out if I reroute these systems and reconfigure the warp field and run a complete internal whootchacallit on the computers and...

Sisko: It was seeking deeper meaning. Jake, do you see what we've learned from all this?

Jake: Check out the babe that just came off that transport!

Geordi: Well, wherever it's going, I'm sure it'll have more luck with women than I do.

Sulu: Don't call me Tiny!

Sarek: Sometimes logic fails me where chickens are concerned.

Mr. Homn:

Dax: To get to the other side. Kurzon might have disagreed with me, Tobin I'm sure wouldn't have had a clue, and then there's...

Tuvok: That's not a question we'd prefer to hear from a senior officer. It makes the junior officers nervous.

Kirk: Maybe chicken's weren't meant to live in paradise. They're supposed to struggle--to cross roads they find in their paths. Only in this way do their lives have meaning.

Nog: I am honored to be the first Ferrengi to eat an earth chicken.

Anon 7: That road was destroyed in a computer simulation. The chicken must report to a disintegration chamber.

Cyranno Jones: One little chicken can't be dangerous.

The Pakleds: The chicken is smart!

Dr. Pulaski: He didn't want to use a transporter.

Garak: He's only a simple chicken. Really, Doctor, you are reading too much into the situation.

### Ask Bunny

Hello boys and girls! It's time once again for us to settle down and ask questions of our Resident Rabbit. This week's question is:

"How do you make sure you've got the rocket parts you need?"

The Rabbit Replies:

- Stay in the hobby 31 years.
- Buy stuff in bulk when you can, particularly at auctions.
- Scour old hobby shops; make it your religion.
- Keep everything....

If you have a question you'd like to ask Bunny, just send it to me and I'll see that he answers it. That's all for this week!

### A View From The Rear from Marc McReynolds

The general idea with a rear view conversion for an AstroCam is to make a coupler for the BT-56 body tube, and tape this to the nose of the AstroCam. Now it can look downwards. Put a nosecone of some sort (spare BT-55 or Maniac nosecone) on the base of the AstroCam, which is now at the top, for streamlining. Use a shorter delay engine (e.g. 5 seconds or less) to get a ground or horizon shot.

The alternate approach below helps eliminate blurring, the most common problem with the AstroCam:

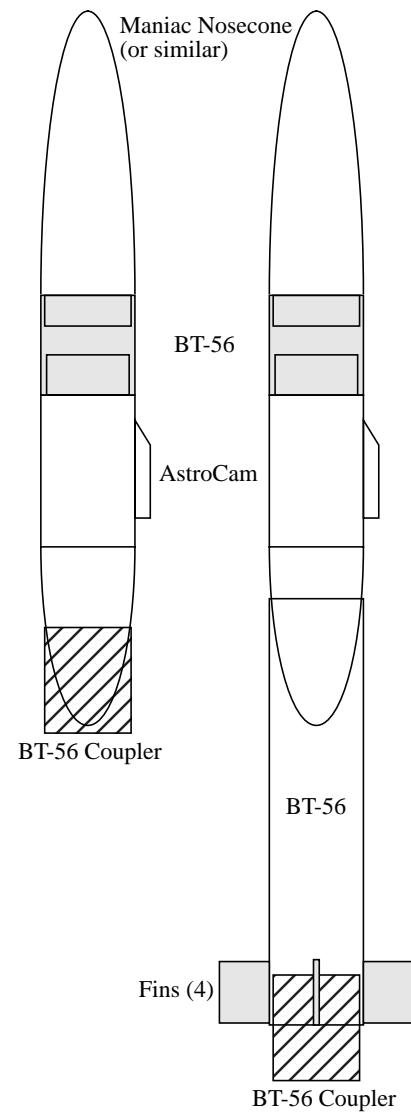
Cut a BT-56 or similar (some gift wrapping paper tubes are about right) to a length of about six inches.

Make 3 or 4 small fins (about 1/2 sq in each) from balsa or thin cardboard and attach to one end of the tube. Glue the BT-56 coupler made above halfway into this end of the tube. Attach the shock cord in this end.

Put the nose of the AstroCam into the other end and tape in place. Tape a BT-56 nose (Maniac nosecone is best, or use a BT-55 nosecone) to the AstroCam base (now pointed upward) for streamlining.

Extend the shutter string to account for the new tube.

What this does is to keep the AstroCam stabilized at ejection, instead of its normal tendency which is to begin to tumble. This reduces or eliminates blurring. Swing test the model (with engine in place) to assure that the upper fins were kept small enough to maintain stability.



## Heard on the Street (with apologies to the Wall Street Journal)

**Welcome to the Club** - Emil C. Bartholet, Sarah Chaney, Sean Coghlan, Robert Harkess, John, Kimber, & Michael Guzik, Jeffrey R. Jones, Rick Knipfer, Todd D. Martin, Dan, John, & Ken McCallum, Dave McWilliams, Dirk Rispens, Steven Scherbinski, Ryan Schmitt, George Scruggs, Andrew Trbovic, and Brian Waterloo have joined NIRA in recent months, Welcome!

**No Money Back** - You've probably heard about the Mars Pathfinder probe. Once it lands on the Red Planet, Pathfinder will release the Sojourner Rover, a little laboratory on wheels. Sojourner will cruise about the Martian surface performing experiments. It turns out that Sojourner and Pathfinder will communicate using two standard, off-the-shelf 9600 baud radio modems. According to Jet Propulsion Laboratory program manager Donna Shirley, the modem manufacturer warned JPL that sending the modem to Mars would void the warranty. Guess the service call would have cost them too much, eh??

**Rinse and Repeat** - NASA has decided to go ahead with mission STS-83R, the MSL-1 reflight, on July 1. The same crew will fly the mission. In a manner similar to the STS-79 restack (done because of concerns over nozzle erosion in the SRB's), Cape Kennedy technicians will "steal" the solid rocket boosters originally scheduled for STS-85.

**Up, Up and Decay** - Orbital Sciences Corp. launched a Pegasus XL rocket on Apr 21, placing the Minisat-01 satellite in a 554 x 582 km x 151.0 deg orbit for the Spanish space agency. In addition, the third stage consisted of an Orion 38 rocket motor and the Celestis satellite. The Celestis is a set of capsules containing the cremated ashes of 24 people, and inaugurates a new form of burial provided by Celestis, Inc.

## JAY APT RETIRES FROM ASTRONAUT CORPS

Four-time Shuttle astronaut Jay Apt will leave NASA in late May to become director of the Carnegie Museum of Natural History in Pittsburgh, PA.

"The astronaut office will miss Jay's dedication and spirit," said David C. Leestma, director of Flight Crew Operations. "I am sure he will use this new position to continue his efforts to educate and inspire young people to excel."

Apt first flew on STS-37 on Atlantis in 1991, conducting two spacewalks, including one unscheduled EVA to deploy manually the antenna on the Gamma Ray Observatory spacecraft. He flew twice on Endeavour, during STS-47 in 1992 for the Spacelab-J mission, and

again for STS-59, the first flight of the Space Radar Laboratory in 1994. Most recently, Apt flew aboard Atlantis on STS-79, the fourth Shuttle-Mir docking mission, in 1996.

"Every minute that I've been a part of the space exploration program has been fascinating" said Apt. "I am delighted to have had the opportunity to fly around our planet hundreds of times, and now it is time to give something back to the people who sent me there. I am thrilled by the chance to return to Pittsburgh and lead one of the best museums in America into the next century. Providing an exciting environment for both families and scientists to learn about this planet is going to be the most challenging and interesting job I can imagine doing."

## NSL CHANGES!!

The National Association of Rocketry announces a shift in the date and location of its 1997 National Sport Launch from Memorial Day weekend in Dallas, TX, to 4th of July weekend in Geneseo, NY, the site of NARAM-37. The already-scheduled NYPOWER International high-power rocket launch co-hosted by Tripoli Western NY and the MARS NAR Section has been designated as the 1997 NAR National Sport Launch.

The shift in NSL was necessary because the DARS Section, hosts of the originally-planned event, lost use of their primary field several weeks ago and were just denied a waiver by the FAA for the replacement field that they had secured. I would like to thank DARS and the previous NSL Director, Scott Hunsicker, for all the work that they have done to date on NSL and express my regrets that matters beyond their control have forced them to have to give up what would have been a fine event.

The new NSL will be held at the huge open field and airstrip of the National Warplane Museum in Geneseo, NY, on July 4-6, with flying 9 AM - 5 PM each day. This event has been scheduled for some time already as NYPOWER International, and I very much appreciate the willingness of the host section and prefecture to take on the added responsibilities of the NAR NSL on short notice. More information on the event will be posted here by the event directors, and can also be found on their web page:

<http://Members.Aol.Com/Rocket Web/NYPower.htm>

Event directors are:

Ray Halm (TRA West NY) at (716)634-1396 or [RocketWrks@Aol.Com](mailto:RocketWrks@Aol.Com)

Andy Schecter (MARS) at (716)473-4398 or [75027,3201@Compuserve.Com](mailto:75027,3201@Compuserve.Com)

The motel for the event is the Days Inn of Geneseo, NY (716)243-0500.

## Quickie Review - Venus Probe by Jonathan Charbonneau

"Danger! Extreme Danger!"<sup>1</sup> Rocketeers beware! Don't let the Venus Probe Beta Series rating fool you. I recently purchased the kit, and just like the Sidewinder kit I wrote about previously, I believe this is a Challenge Series kit.

First, the engine mount on this kit is quite different from that of the typical Beta Series kit. You must follow the directions explicitly to get it right.

Second, this rocket has a couple of three piece fins, and Beta Series kits have never had this type of fin in the past.

Third, the launch lug stand-off is glued in line with a fin. The forward launch lug must be glued to the side of the stand-off. I recommend that anyone building the Venus Probe should read the instructions in Step 14 many times before attempting to complete the step.

Fourth, the dowels included in the kit must be measured and cut to fit. Another first I've seen in a Beta Series kit.

Last, but not least, some parts have to be painted before assembly as painting will be more difficult if done last. This is especially true of the alien an the legs.

<sup>1</sup> Line iterated many times by the Robot from "Lost in Space", a popular sci-fi show circa 1966.

## Quickie Review - Estes Venom by Mark Soppet

The newest Beta series rocket from Estes, the Venom. is here. Please don't dismiss this as yet another BT-50, four fins and a nose cone rocket which we all know and love :-)

If you are buying a rocket for its looks, buy the Venom! It features a nose cone with a canopy molded on it, which gives it a futuristic look. The fins use the T3(TM) system of attachment, a feature builders of all ages will enjoy.

My only complaint is that the red on the spiffy snake decal matches the red that Estes recommends you paint the rocket. If you don't want to run into this problem, just paint the rocket another color.

The packaging claims that the Venom can fly up to 1100 feet. It should make a good sport flier. So, if you want a rocket that will give you great A - C engine flights, or just a rocket that will look cool, I would recommend this kit.

## Coming Next Month

A first look at MRFF!

Reports from Moosehart, Muncie and other exotic places!

Estes Industries Revealed!

