

THE LEADING EDGE

Newsletter of the Northern Illinois Rocketry Association,
NAR Section #117, no longer Tripoli Prefect #36

Volume 19, Number 4
July/August 1996



If You Missed MRFF.....



You Missed A BLAST!



T MINUS 1 - NIRA'S CALENDAR OF UPCOMING EVENTS

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 (708) 690-5442 if you can help with ideas or can speak yourself.

- August 2: Regular Monthly Meeting.
- September 6: Regular Monthly Meeting.
- October 4: Regular Monthly Meeting. RCHTA Planning.
- November 1: Regular Monthly Meeting. Nominate Officers.
- December 6: Regular Monthly Meeting. 1997 Planning.

1996 CLUB LAUNCH DATES

Launches are BYOL (bring your own launcher). The location for our 1996 launches is either Community Park in Lisle, or Waterfall Glen in Lemont. If you have questions prior to any launch, call the NIRA hotline at (708) 690-6353 for a recorded message of where the current launch will be.

- August 18** - Club Launch at Waterfall Glen in Lemont. 10am to 5pm. See map on Page 11.
- September 15** - Club Launch at Community Park in Lisle. 2pm to 5pm.
- October 27** - Club Launch at Community Park in Lisle. 2pm to 5pm. Special event - launching rockets built at RCHTA show.
- November 17** - Club launch at Community Park in Lisle. 2pm to 5pm. Last scheduled launch of 1996!

STAFF

- Bob Wiersbe - Wheaton Bound
- Ric Gaff - NARAM Bound
- Simon & Garfunkel - Homeward Bound
- Dennis Rodman - Rebound

CONTRIBUTORS

- Lawrence Bercini, Mark Bundick, Jonathan Charbonneau,
- Adam Elliott, Ric Gaff, Ken Hutchinson, Bob Kaplow,
- Dave & Robin Miller, Pierre Miller (not related to Dave & Robin),
- Jeff Pleimling, Bill Thiel, Bob Wiersbe

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 (got that, Tom? :) ; all other uses require written permission of the Northern Illinois Rocketry Association. Lucerne, CA (AP) A new law in California makes it even harder for rocketeers. The so called "Back to Basics" law forbids the use of non-biodegradable parts and adhesives in all rockets, kites, radio controlled airplanes, sailplanes. No plastic substances may be used at all. "What these modelers don't realize is that when something gets lost from one of their models it ruins the environment forever. I've seen snakes that died from trying to eat a nose cone because they thought it was an egg," said California Park Ranger Matt Tress. "There's string, bits of plastic, and metal all over our parks after a weekend, and something had to be done about it." EPA officials are applauding the new law, while hobbyists and manufacturers have been raising an uproar. "This is the stupidest thing I've ever seen, and I've seen a lot", one representative from Estes Industries was heard to say. Representatives from the Tripoli Rocketry Association were notably absent during the public hearings. It was rumored that one of the directors of the association said "We don't obey laws anyway, so why should we care?"

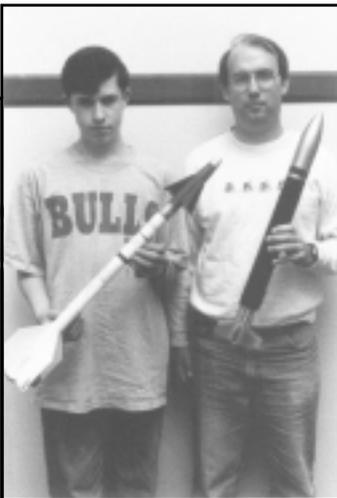
Coming Next Issue:
 NARAM Reports!
 More About MRFF!
 Eat Cheese or Fly!
 U.S. Rockets To Make A Comeback?
 A Plan Of Some Sort!
 50 Ways To Lose Your Rocket!
 Why I Ended Up In The J. Pat Miller
 Rehab Center!

Model of the Month Winners

May - Mark Soppet was the hands down winner in Youth with his first rocket ever, the Gnome he built at RCHTA several years ago. The Adult winner was Joe Nowak's Mini Trident. It got lots of oohs and ahhs, and not just at Oberweis where I took his picture [Where's the plans?? - Editor]
June - Youth: Bryan "Lean and Mean" Chesi took top honors with his new Estes Sidewinder. Adult: Joe Nowak returned for the repeat with his Vaughn Brothers Mini Wild Thing. Congratulations! (May photos by R. Wiersbe, June photo by J. Charbonneau)



Adam Elliott's D80 at the moment of liftoff. There are 8 A10-3T motors in this rocket, and all of them ignited! A. Elliott photo.



Team Kitbash
by Bill Thiel

Its now Saturday night, the first half of MRFF flying is over and we are all looking over the rockets for the Peoples Choice. Bill Thiel asks for a show of hands of the people who want to join in the Team Kit bash event. This year we got 24 people to join, and this made it easy to split in to teams of six.

The teams are now placed at their tables and we had a drawing for team themes. This year the U.S.A. is host to the Olympics so the theme categories are all Olympic related. The ones picked were: Mountain Bike Racing, Shooting, Athletics and Swimming. Each team was given the same 2 rockets, a Nova Payloader and a Star Rider. Now the small room is filled with the smell of wood dust whether it was from the balsa wood from the rocket kits or from the heads of the team members trying to figure out what to do with the kits to match the design to the theme.

As the one hour time limit fast approached the teams are kept informed by Bill Thiel with time left signals. In this one hour time the teams can only use the kits provided and the packaging from them for the construction of the rocket of a most unique design (glue and paint are allowed as is nose weight).

The Bolivian Women's Synchronized Shot-put Team (Jonathan Charbonneau, Ron Husak, Kevin Wickart, Tom Stump, Chad Ring, Steve Koszuta) picked the theme of Mountain Bike Racing from the hat. The B.W.S.S.T. team came up with a model that had two bikes with riders racing up the side of the rocket. The fins were used for the starting line complete with string and pennants. The models name was PIKE'S

PEEK or BUST!

The Shooting Stars (Mike Ugorek, Matthew Duckworth, Adam Elliott, Kurt Smeiska, Lila Schumacher) got off to a big bang when they picked the theme of Shooting from the hat. This team went through it's weapons book and came up with a rocket that they called SUPER SHOOTER, it was shaped after a field cannon with a long, long barrel. They also built a ramrod to use to put in the wadding and parachute.

What do you get when you put a bunch of odd balls together (Ty Thompson, Greg Roman, Bob Hart, Christopher Kotolski, Lawrence Bercini), you get a team who picked "Athletics" from the hat, and they call themselves Go For The Gold. The rocket that was put together by this team had the three level awards podium and cutouts of athletes standing on them used as the fins. The rest of the rocket was covered with all types of balls etc. The rocket is called WIDE WORLD OF SPORTS

The last team is all wet. the list of "Drowning Victims" (team name) is Sabrina Ugorek, William Wickart, Dave Bassett, Kori Smeiska, Andrew Christensen, Erik Christensen, Mark Soppet. *The quick work of the R.S.O. averted a major disaster by giving C.P.R. to the team before the event began.* After the team picked the theme of Swimming they thought it might be a good idea to learn to swim. Some of the team went on to learn to S.C.U.B.A. it was then they came up with an idea for the rocket. DEMENTED SKY SCUBA. The rocket was in the shape of an swimmer complete with the scuba tanks, the legs formed the Fins and the nose cone had the face painted on it by Sabrina.

Lets all take a time warp to Sunday morning at about 11:00 A. M. The four teams were rounded up. The rockets are passed out from being kept over night by the judge so he could score them on Creativity and Originality. At this point the DROWNING VICTIMS and GO FOR THE GOLD were in a tie



The "Drowning Victims" keep their heads above water, and work on the "Demented Sky Scuba". R. Miller photo.

followed closely by the B.W.S.S.T. and SHOOTING STARS.

The rocket that looked like it would prang was the SUPER SHOOTER. Instead of a prang it gave a very unusual flight, at about 30 to 40 feet up the rocket made a 360 degree loop and then went straight up to finish with a good recovery. The Shooting Stars wound up with a score of 1285 to put them in forth place.

The B.W.S.S.T. 's rocket was the most like a rocket in design the flight was also that of a well balanced rocket it did have some trouble on landing it broke a fin. They finished in third place with 1295 points.

When the Drowning Victims placed their rocket Demented Sky SCUBA on the pan everyone was told to head for the life rafts (heads up) the swimmer had just a little trouble in the change of environments the result of the flight and static scores was 1365 points.

As you might have guessed by now the team GO FOR THE GOLD went for the gold and got it with a very good flight and recovery they wound up with a score of 1425 points and the gold or in this case a model rocket kit to build.

The best part of the Kitbash was the team work on the part of the randomly chosen teams everyone worked together well and had a good time. THIS WHAT THIS HOBBY IS ALL ABOUT!



Chad Ring and Kevin Wickart seem very pleased with their teams entry - "Pikes Peek or Bust". R. Miller photo.



The Go For the Gold team is mesmerized by Lawrence "For Beginners Only (not)" Bercini as he explains what a body tube is. R. Miller photo.



The Go For the Gold team won the gold in the Kitbash Contest, thus earning the right to smile for the camera. J. Pleimling photo.

People's Choice Contest

by Ken Hutchinson

One of the Saturday evening activities at MRFF is the People's Choice event which is a free form 'beauty contest' for rockets something like our monthly Model of the Month contest. There were four different categories of models but no other rules. Beauty is strictly in the eyes of the beholder. You can vote for the model with the best craftsmanship, the model of your favorite subject, the biggest, the smallest, the one that made the most spectacular flight--whatever. It is entirely up to the individual voter as to how the entries should be judged. Each voter votes for one model in each category, the outcome is decided by how many votes each model gets. The number of entries was greatest in the adult model rocket category and the voting was spread out pretty well there. Several models received only one vote, but two received none, so there were a couple of real sportsmen out there, folks.

The entries were quite varied. There were kits of course. Standard ones like Paul Hemminger's RAMJET, oddroc ones like Bob Hart's Venus Probe, and semi-kitbashed ones like Bill Thiel's Trident. There were original designs like Adam Elliot's Monolith (from the 2001 movie) and Kevin Wickart's Belle X-1 which is the figurine of the heroine of "Beauty and the Beast" mounted on a large conical skirt for stability. There were medium powered rockets like Bob Kaplow's Archer and Jeff Pleimling's Thug.

The first category was youth (under 16). With prizes for the top three places and only three contestants, no one went home too unhappy. Mark Soppet took top honors with a nice Estes Bullpup. Matthew Duckworth was close behind with his Phoenix. Kori Smeiska placed third with a well built, though battle scarred DCX.

The leader division (16-18) was slightly less of a contest. The sole entrant, Ron Husak, managed to eke out a first place finish with (what else?) Clusterama.

In the adult model rocket category Lawrence Bercini scored a convincing win with his excellent rendition of a North Coast BOMARC. Steve Koszuta took a road less travelled and finished

his Estes Saturn V in the Skylab configuration to earn second place. And if you saw it fly, you had to love it, Bob Wiersbe's Gemini Titan with the plastic model Gemini capsule placed third.

The final category was adult high power. Dave Miller walked away with first place on the strength of his spectacular USS Atlantis 'B'. Now we might chide Dave for entering the same model two years in a row. Sadly, last year's Atlantis crashed, this year's was a new effort. Ty Thompson seemed a little sheepish about going up against Dave's Atlantis but he was assured second place since he was the only other entrant and since his Hawkeye took 20% of the vote in the face of stiff competition, he did just fine.

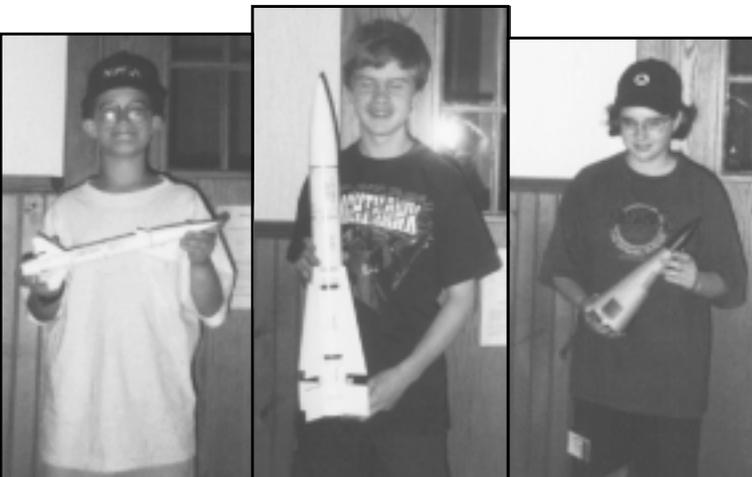
Congratulations to everyone who entered. It was a fine bunch of models. Next year let's see some more entries. It's easy to enter although not always so easy to win. And, if you are looking for a way to get involved in running MRFF next year try volunteering to run this contest. It is a simple task and a fun way to get your feet wet with helping to run NIRA.



Our only Leader entry, Ron Husak, was the hands down winner with "Clusterama".



Dave Miller (left) won in adult HPR, and Ty Thompson finished 2nd.



The youth winners, from left to right: Mark Soppet with his "Alabama Ground Zero" Bullpup, Matthew Duckworth with a Phoenix, and Kori Smeiska with a DCX. Well done!



The "adult" winners. Middle, Lawrence Bercini (1st), Left, Steve Koszuta (2nd), Right, Bob (Mr. MRFF) Wiersbe (3rd).

Deep Space Transport 300
by Jonathan Charbonneau

I used to be clusterphobic. To learn why requires knowing a little history about clusters in model rocketry. In the 50's and 60's, the largest model rocket engine was the "C". If you needed more power than that, you had to cluster two or more engines together. In the early 70's, the "D" engine was introduced, followed by the "E" and "F" in the mid 70's, the "G" in the early 80's, and finally H's and higher in the late 80's. As the engines got bigger and better, clustering had become more of an FX technique and was rarely used for power.

I always thought a single engine was better than a cluster until the day I read in the glossary of model rocket technology, under optimum weight, that a multistage rocket is sometimes rivaled by a cluster rocket. This prompted me to investigate clusters more deeply and found that in some cases, a cluster is the ticket to best performance. If you still don't believe me, consider the following two problems.

One: You have a large rocket and the launch area is so small that even the smallest engine strong enough for a safe flight is too big for the launch area. What are you going to do? A cluster is the answer. Take four A10-3T's for example. This cluster gives you a C40-3, more thrust than the maximum possible with a single "D" engine, and with only half the power. A cluster allows you to get high thrust with low power to fly big rockets in small launch areas.

Two: Suppose you have an average size demonstration rocket and want to blast it into orbit, or in layman's terms, send several miles high. You can't use a single high power engine in a rocket designed for D12-3 because it will rip the rocket apart with it's extreme thrust. Again, a cluster is the answer. Three F7's clustered together will equal a 180Ns H21 type engine. This will take an Estes Shadow a lot higher than

would an H180, and despite the F7's reputation of failures, is less likely to damage the rocket. The H180's high thrust will surely cause damage.

In summary, clusters can expand the range of power that can be used in a rocket at both the low end (for flying in small areas) and the high end (for extreme altitude).

Upon realizing this fact in spring '95, I went on a quest to find a good cluster rocket. At Schuham Ace Hardware on Roosevelt Road, I happened across the Estes Deep Space Transport, a rocket that begs to be clustered due to its tri-body design. So I bought it and converted it to a three engine cluster. I flew it for the first time at MRFF 95 with three A8-3's and the flight was not only flawless, but one of the outboard engines managed to drop into an open Rubbermaid container near the range head. The best flight to date was flight number six at ECOF 95 with three C6-7's. This flight was stable despite there being no weight added to the nose. This lead me to buy another Deep Space Transport which I converted to use two 18mm and one 24mm engine. As of this writing, I haven't flown it yet.

To build the Deep Space Transport 300, you will need the following:

- 1 - Deep Space Transport Kit
- 2 - EB-20 Engine blocks
- 4 - AR2050 Centering rings
- 2 - 2 3/4" lengths of BT-20

(You may substitute two EM2050 engine mounts for the rings and tubes listed above.)

ASSEMBLY

Assemble the engine mount as directed in Step 1 of the instructions. Ditto for balsa parts in Step 2. Assemble engine nozzles as directed in Step 3, but do not install cardboard disks yet. Install engine mount and mark body tubes as directed in Steps 4 & 5.

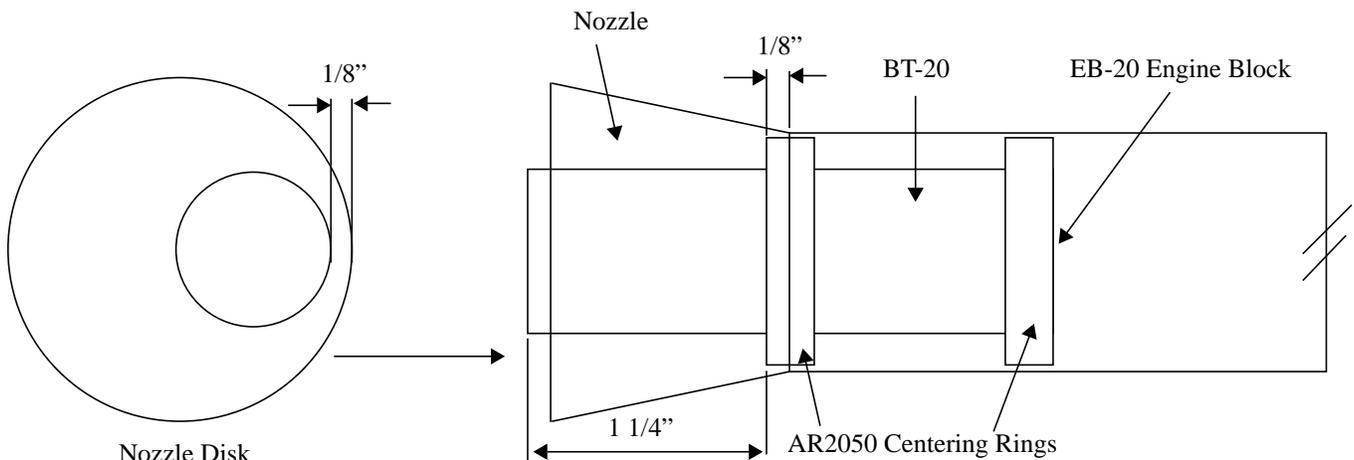
Assemble the two outboard engine mounts as show in Figure 1. Make sure the EB-20 and AR2050 are glued flush with the rear of the BT-20 tube. Glue the other AR2050 1 1/4" from the other end of the tube. Mark this ring 1/8" from the rear edge.

Orient E.T.B's as directed in Step 6 and mark rear with an "R". Glue one of the outboard engine mounts into the rear of each E.T.B., up to the 1/8" mark you drew on the centering ring. Glue nozzles and tank spacers to E.T.B's as directed in Step 6. Place a scrap piece of BT-20 on one of the cardboard disks 1/8" from one edge and trace around the tube with a pencil. With a sharp hobby knife, carefully cut out the small circle you just traced. Repeat with other disk. Test fit disks in E.T.B nozzles, sanding holes as needed for a proper fit around the engine tubes. When disks are properly seated in nozzles, apply glue around joints between disks, nozzles, and engine tube. Upon completing this step, you will have reached the end of all changes. Finish assembling the Deep Space Transport as directed in the instructions.

Flying the Deep Space Transport 300

Recommended engines (3 required): A8-3 (first flight), B4-4, B6-4, B8-5, C6-5

The outboard engines must be the same impulse type (i.e. B6), the center (core) engine must be of equal or greater impulse than outboard engines. Example: If outboard engines are B6-4's, the center engine must be a B6-4 or higher (B8-5, C6-5, C6-7). Do not mix composite engines with black power engines, black powder engines tend to ignite faster than composites which could cause an unstable flight. Use enough tape on the outboard motors to keep them from falling out while the rocket is on the pad, but not enough so that the ejection charge can't push the motor out.



Outboard engine assembly, make 2

Build the American

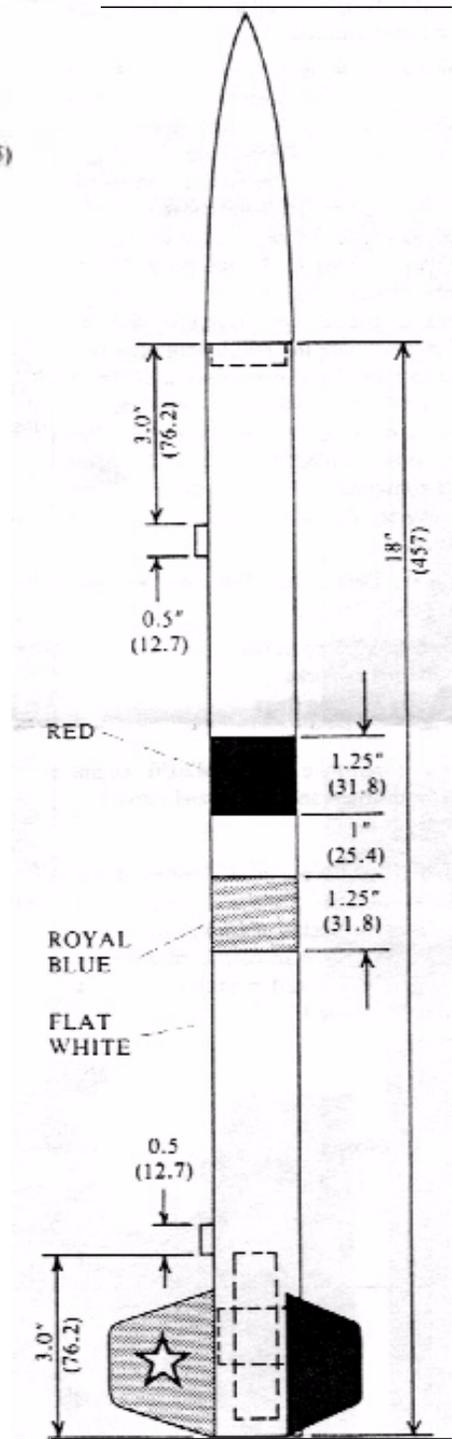
by Richard Masse

PARTS LIST (ALL ESTES)

- 1—BT-55
- 1—PNC-55AC
- 1—EH-2055 ENGINE MOUNT
(HOOK EVEN WITH END OF BT-55)
- 2—1/8"×1/2" LAUNCH LUGS
- 1—1/4"×18" SHOCK CORD
- 1—LONG RED, WHITE AND BLUE
CREPE PAPER STREAMER



1 BLUE FIN, 2
RED FIN'S; WHITE
STAR ON BLUE FIN



ATTACH FIN'S WITH TITEBOND
AND FILLET THEM WELL.
FLY WITH A8-3, B4-4, OR C6-5

Build the Flying Jenny II

by Tom Costello

[The original Flying Jenny was designed by John Belkewitch, an early NAR member. The Estes Model Rocket News Library Collection lists the original Flying Jenny as plan 21. Tom's Flying Jenny II is the result of improvements to the original. —CPB]

Buried in the voluminous Estes Model Rocket News Library Collection (catalog number 84775) is a rocket plan for the Flying Jenny. Because of its relatively large control surface area and its engine-ejection recovery, the Flying Jenny is not a competition model. However, it is a super sport model when built with slight modifications.

The original version presented in the 1964 plans calls for 3/32" balsa and suggests an A8-3 as max power. For the three Flying Jennys I built, anything over an A8-3 exceeded the speed of balsa, so the designer knew what he was talking about. But a close examination of the wreckage showed that the failure was not structural separation at the joints— all the joints had epoxy fillets. I decided then to experiment with different types and thicknesses of wood to obtain a Jenny that could perform consistently with anything up to C engines.

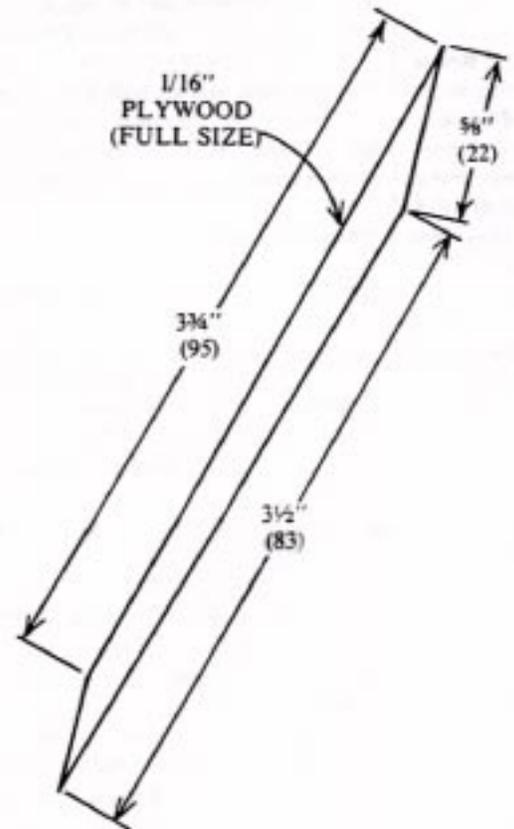
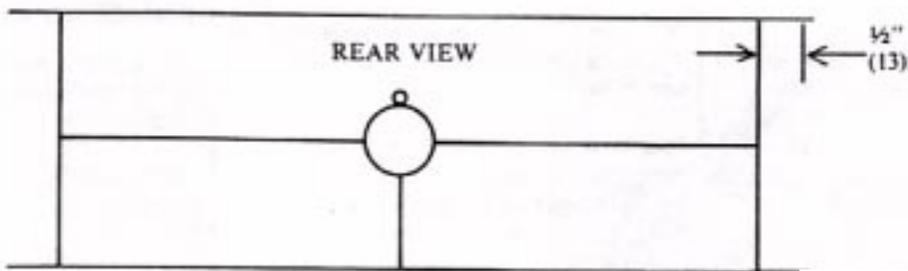
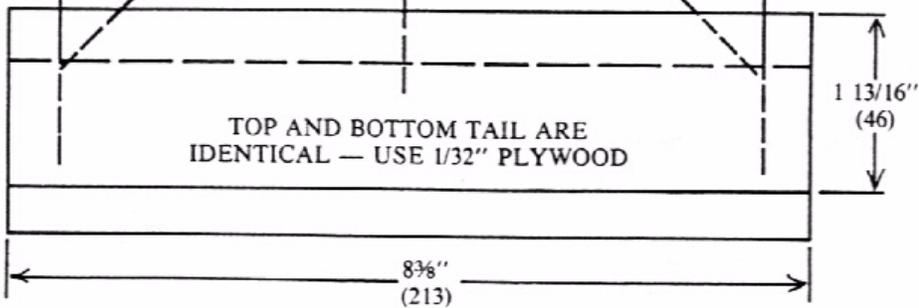
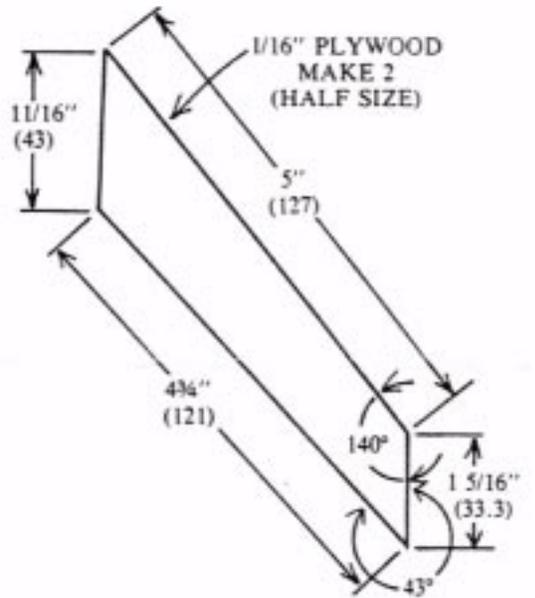
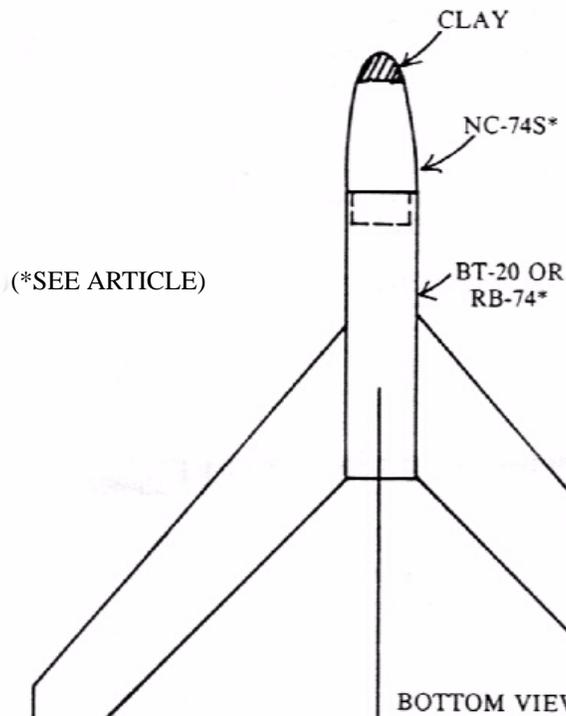
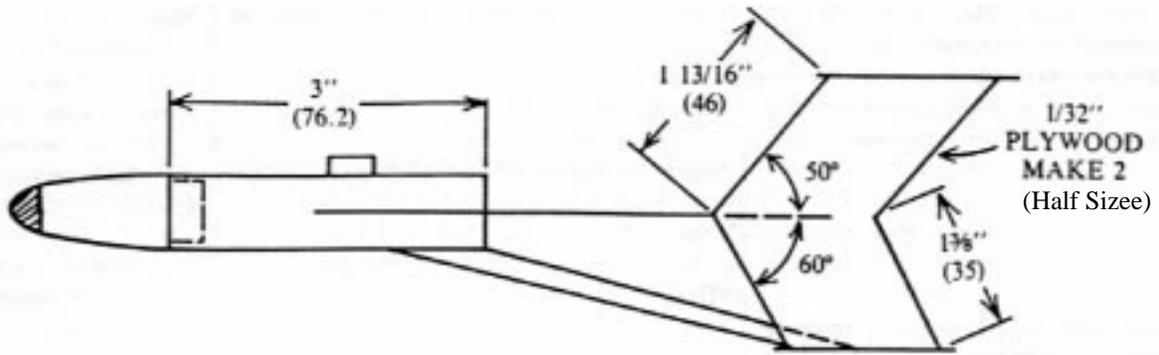
The second version used 1/64" plywood struts and control surfaces, and flew well on an A8-3, but shattered with a B. Next, I tried using 1/32" plywood for the three main struts. The struts survived the B, but the tail section didn't. Finally, I beefed up all the tail surfaces to 1/32 plywood, upped the struts to 1/16" plywood, and substituted a CMR NC-74S nose cone with clay added to compensate for the added weight of the plywood. The resulting glider performs consistently with C engines and glides fantastically after a straight and vertical boost. In addition to being stronger, the plywood improves durability: my Flying Jenny II has logged over ten perfect flights without a scratch!

The BT-20 called for on the original plans was replaced by the equivalent CMR RB-74 body tube; but either can be used. [Using an RB-77 tube and nose cone enables you to tape a small streamer to the engine; a minor modification well worth the effort for the additional "elegance" of recovery. —CPB]

Fillet all joints with epoxy. Also spread a thin layer of epoxy on the base of the plastic nose cone to protect it from the ejection charge. Glue the nose cone in securely, because it also serves as the engine block!

Your Flying Jenny may feel a bit heavy, but remember: it's a good flyer!

Both plans borrowed from the NAR publication currently know as Sport Rocketry.



Triskalideaphobia
by Pierre Miller

"Well, what do you think that he wants." asked Dina Mascio.

"Or she wants." replied Pierre Miller. "I think that it is pretty obvious what this person wants. They want to meet us in the Museum of Science and Industry at 9:13 on the thirteenth of April. At entry point 1.3. The letter is signed Trisk. I think it means Triskalideaphobia."

"Triska-what???" asked Rick Chase in bewilderment.

"Triskalideaphobia, in other words, someone who is afraid of the number 13."

"I don't get something, if they are afraid of the number 13, then why would they want us in the Museum with all of the 13 business." asked Dechet Ackely.

"I don't know. But no matter which way we slice it, we're still going there on the thirteenth." said Pierre.

The Malledech Detective Agency had just gotten a letter from someone who calls himself (or herself) Triskalideaphobia. Or, like Pierre said, a person who is afraid of the number 13. The entire agency was huddled up around a table to read the letter.

April 13.

"Well, we're here. No sign of some psycho." said Dechet aloud.

"If he was here, he probably would have kept quiet. Speaking of quiet, there are almost no people here. Usually there are enough aerospace buffs in the state to keep this place packed 24 hours a day."

"Well, I am glad that you have finally gotten my message. Public mail is so slow." said Trisk, as he slid down from a rope in front of the Malledech Detective Agency - with a gun.

The museum guards drew their guns and prepared to fire on Trisk, but he dropped them all in their tracks. Tranquilizer darts.

"Trisk, now, take it easy. I know you must be a pretty nice guy inside, just put the gun down."

"I didn't want to shoot anybody, but I really want you to see something that I am going to do."

"What?"

"I am going to redo Apollo 13. Are any of you familiar with the Saturn V?"

"I am." said Pierre, while he raised his index finger.

"Good, then we have a rocketry enthusiast here."

"I guess so."

"Are you a member of the NAR?"

"Yeah."

"Darn."

"Anyway," Pierre asked as Trisk pulled him to the front of the line, "how are you going to put any Apollo modules back into action? Some of this stuff is older than us, by about thirteen years. Cape Canaveral is about 800 miles away, and I think the Saturn V is in the National Air & Space Museum, another 600 miles away. You are never going to get a 900 ton Saturn V out of there without getting arrested."

"Who ever said anything about a 900 ton Saturn V?" asked Trisk.

Pierre gave him a puzzled look.

"What about the 1200 pound Saturn V that is in this very museum?"

"Huh?"

"There is a 1/10 scale Saturn V around the main entrance. I am going to put five O40,920 motors in the first stage and recreate the launch. And I plan on fixing the mission this time."

"This plan is all well and good, but it seems like you have one major hole in this."

"What is it?"

"How in the world are you going to get anything like a model to the moon?"

"I got that covered. You may have forgotten that the entire rocket has 3 stages, enough to allow for more power to be added."

"Oh, yeah. How are you going to pull this off? The whole thing is 36 feet tall, and doesn't look very stable."

"Don't worry, once I put the astronauts in to the model, I won't need to stabilize it any more because it will have enough noseweight."

"Astronauts?"

1:00 P.M.

"Okay, Pierre, your name is Jim Lovell. Rick, your name is Fred Haise. I forget the other guy, besides, two people is enough to make this thing stable. Dina, Dechet, you are going to be Mission Control. You will be in radio contact with Jim and Fred. Now, I want you to sit down and listen." said Trisk. Pierre and Rick were in astronaut suits, Dina was in a white vest, and Dechet was wearing a blue short sleeve shirt and black necktie, with dark, plastic rimmed glasses.

"Pierre, Rick, I want you to get into that little hatch that I rigged up." Somehow, they managed to squeeze in, then buckled themselves in.

"Dechet, Dina, you are both going to help them get through this. Sit down at those chairs, and talk to them if they have any trouble." They sat down in front of some sort of control panel.

"Mission Control?"

"Go."

"Astronauts ready?"

"Go."

"And we are go for launch. Launch commencing in 5 ... 4 ... 3 ... 2 ... 1 ..."

All five of the 'O' motors in the first stage ignited at once, and the area around the rocket instantly sublimed with thick black smoke. Water hoses kicked in, spraying 8,000 gallons of water at high pressure at the bottom of the rocket.

The rocket lifted slowly off the launch pad. The top of the museum roof shattered as the Apollo capsule crashed through it. As the other stages plodded through the roof the hole got wider and wider. The four fins on the first stage sheared off as it passed through the gaping hole. But the rocket remained stable.

"This is Mission Control to Apollo 13.5, do you read?" asked Dina into the headset microphone.

There were a few seconds of silence. "Yes Mission Control, we read." replied Pierre.

"Pierre.." Trisk flashed a dirty look. "Jim," Trisk smiled. "We monitor your altitude, but not your heading. What do you see?"

"Well, we are going over Lake Shore Drive, and it looks like we're heading towards Navy Pier."

"Haise, what is your speed?"

"We are doing about 500 miles per hour."

"Uh, oh. I think you might start to weather-cock.."

"Yeah, I agree." replied Pierre. "I want to speak to Trisk."

"Yes, this is Trisk."

"I think your design needs some work. With Haise and I crammed into the top we are overstable and we are weathercocking too muuuchhh!" Pierre hollered as the Saturn V flipped over. He fell almost out of his seat, and his head landed on the button marked "SECOND STAGE IGNITION". The second stage came to life, sending them on a course straight back to the museum.

"Apollo 13.5, do you read me? Apollo 13.5 DO YOU READ!?"

There was static.

"I wonder where they could be?" asked Dechet.

Her question was answered when the model plunged through the roof, and the corner of the side wall. As the model ripped through the wall, paintings and other artifacts fell off, and the entire Apollo capsule was shattered.

The model crunched to pieces as it spattered into the marble floor. The individual transitions and other parts flew into shards. The model skidded along the floor for hundreds of feet, then came to a complete stop.

Dina and Dechet jumped up and ran over to the wreckage, and pulled open the hatch. Pierre and Rick moaned as they struggled to get out.

"Well, at least we've got all the damage we can get." said Dina.

At that moment, the Saturn V's first stage fell through the roof, breaking more plaster. Dina and Dechet ran from the scene. The stage broke in half over the other stages. As this happened, Rick fell over, his foot hitting the ignition switch for the third stage. The motors in the last stage started, but instead of moving forward the whole assembly exploded! The walls of the museum began to quake, metal exhibits vibrated creating a deafening high pitched shrill, and glass shattered.

Minutes Later...

Pierre and Rick woke up, and struggled to get out of the rubble. Dechet and Dina helped them out.

"Come on Pierre, Rick, say something." said Dina.

"Houston, we have a problem." said Pierre, as he fainted.

"DARN IT!!" yelled Trisk at the top of his lungs. "I don't think any number of recreations of this will ever make Apollo 13 successful."

"You forced two people into a doomed flight and they nearly get killed, and that's all you can say?" asked Dechet.

"Well, what do you want me to say?"

"I don't know, but I do know what will be said to you."

"What?"

Two strong hands grabbed Trisk from behind. "You have the right to remain silent, anything you say or do can and will be used against you in a court of law..." A cop had Trisk under arrest.

"Pierre Miller, could you tell me how he got you inside that thing?" asked the cop to Pierre.

"He made a hatch in the side of the third stage that was about 25 inches wide, so we could stay in there."

"How could you survive under such force?"

"The same way you do while riding uphill in a roller coaster, keep your head up."

"Pierre, Rick, are you okay?" asked Dina.

"Just fine, I only feel like I had a missile shoved through my head."

"Well, after we leave, what do you want to do?"

"I know. There's a rocket launch going on at the park..."

The entire team started to laugh as they left the scene of the crash.

**Non-Rocket Scientists
in Sheboygan Wisconsin
by Adam Elliott**

You may have heard by now that a real professional rocket was launched from Sheboygan, Wisconsin. Yep, the real thing. The rocket in question was a Super Loki Dart, one of NASA's many look alike research rockets. This one was special because it was one of four donated to the Rockets For Schools Program. This is where a selected group of high schoolers (but not junior college students!!!) assembled various payloads and put them in the Dart portion of the rocket. Then the rocket gets sent 25 to 30 miles high over Lake Michigan and the payload does its thing.

Five of us from NIRA went up to see the show, Bob Kaplow, Dan Wolf, Tom Pastrick, Jonathan Charbonneau, and of course, me. There were displays of the Loki Dart, cutaways of liquid fuel engines from the really small to the good size (sorry, no F1's). There were also reconnaissance photos which were really neat. You could even buy rocket kits, including one of the Loki

Dart.

Out near the launch site the local Tripoli group was launching some HPR rockets, some of which landed in the very damp recovery area [Lake Michigan]. We tried to get in line to launch some of our own rockets, but they shut down just as we got there, and asked us to leave the area.

Somehow, Bob Kaplow and Tom Pastrick managed to get back into the launch area to see it go off close up. The rest of us had to strain our eyes from a quarter of a mile away.

Not much was happening on the range, other than loading and prepping the rocket. The 2pm launch time came and went.

We were kept entertained by promotional trivia on the radio, things like "This is the first suborbital flight from Wisconsin." Okay, except that most of us have launched rockets in Wisconsin, and they were all sub-orbital. "This is the first

professional rocket launched outside of Florida." Right. We rattled off other places such rockets have been launched, like Wallops, White Sands, Edwards Air Force Base, Alaska, and Michigan to name a few.

Finally, they were ready for launch. The radio gave us the countdown, and swoosh! It went off, really fast too. It didn't make much noise though. The Dart then took 2 hours to come down, somewhere in Michigan.

Right after the Dart was launched the Tripoli group launched a large rocket with an M Spitfire motor in it. This rocket was louder and more impressive than the Dart, even though it



CRAYON ROCKET TIPS

by Bob Kaplow

I've been flying crayon bank rockets for at least 5 years, and can't claim that the idea was original to me. My fleet currently covers 6 sizes, from a 2"x8" A10 powered model, 2.5x12" 18mm motor, the 3"x30" 24mm motor, a 6"x30" 29mm motor, and the 5.5"x 54" 38mm motor. Last summer I scratch built a BT-5 rocket and covered it with a kids fat crayon wrapper to extend my fleet down to the tiny. When the Apogee 10mm motors hit the street, maybe I can do an even smaller crayon. I've also done a large baby bottle using the same techniques.

I use stuffer tubes in all the larger models to reduce the volume to be pressurized by the ejection. Since the glue won't stick to the plastic, I include a centering ring at the tail of the stuffer tube that I pop-rivet to the plastic (use backing washers on both sides of the rivets).

I sand the ridges off the "nose cone" so that the nose comes off easily enough for the ejection charge to deal with. The plastic nose can usually be deformed enough to slide in a bulkhead plate with an eye bolt attached for the parachute/shock cord attachment. Hot melt glue holds this in place.

Lexan window glazing makes a strong fin material, yet doesn't detract from the scale like appearance. I've used it thru I motors without problem. All of the banks are partially molded plastic. Glue won't stick to this stuff well. I've attached fins by pop-riveting an aluminum "L" channel to the body, and then drilling and tapping holes for 4-40 cap screws. The second advantage of this is more portability: the fins can be removed when traveling across the country to a big launch.

Finally, I sometimes put the launch lug on the inside, either on the outside of the stuffer tube, or on the inside of the airframe. Cut a hole in the bottom and another in the nose for the rod to pass thru.

NAR S&T NEWS

NEW MOTOR CERTIFICATION (corrected) - Release 32

The following motors have been certified by NAR Standards & Testing for general use as a model rocket motor effective October 30, 1995. They are certified for contest use effective January 28, 1996.

Note: This announcement was delayed at the manufacturer's request.

The following are all Apogee single-use disposable motors.

Apogee: 10.5mm x 89mm: B2-0, -3 (5.00 N-Sec total impulse, 6.0 grams propellant mass)

NEW MOTOR CERTIFICATION - Release 33

The following motor has been certified by NAR Standards & Testing as of May 6, 1996 for general use as a high power rocket motor. It will not be certified for NAR contest use as it is not a model rocket motor.

The following is an Aerotech reloadable motor, certified only with the indicated size casing and manufacturer supplied nozzle, end closures, delays, and propellant slugs:

Aerotech: 38mm x 250mm Casing: I300-6, 10, 14 (440.0 N-Sec total impulse, 221.6 grams propellant mass, Aerotech "Blue Thunder" propellant)

NEW MOTOR CERTIFICATION - Release 34

The following motors have been certified by NAR Standards & Testing for general use as a model rocket motor effective immediately. They are certified for contest use effective June 30, 1996.

The following are all Apogee single-use disposable motors.

Apogee: 10.5mm x 89mm: B2-5, -7, -9 (5.00 N-Sec total impulse, 6.0 grams propellant mass)

NEW MOTOR CERTIFICATIONS -Release 35

The following motors have been certified by NAR Standards & Testing as of June 30, 1996 for general use as high power rocket motors. They will not be certified for NAR contest use as they are not model rocket motors.

The following are Kosdon reloadable motors, also known as "Kosdon Truly Recyclable" motors. They are certified only with the indicated size casing and manufacturer supplied nozzle, end closures, delays, and propellant slugs:

Kosdon: 29mm x206mm: G40-P (120 N-Sec total impulse, 48.4 grams propellant mass) G75-7 (150 N-Sec total impulse, 67.5 grams propellant mass)

29mm x291mm: H70-P (180 N-Sec total impulse, 81.7 grams propellant mass) H135-11 (240 N-Sec total impulse, 112.0 grams propellant mass)

38mm x258mm: I145-7 (360 N-Sec total impulse, 182.7 grams propellant mass)

38mm x314mm: I170-11 (440 N-Sec total impulse, 287.0 grams propellant mass)

38mm x370mm: I130-5 (550 N-Sec total impulse, 266.0 grams propellant mass)

54mm x250mm: I150-6 (640 N-Sec total impulse, 339.0 grams propellant mass) I120-P (580 N-Sec total impulse, 393.0 grams propellant mass)

54mm x326mm: J230-8 (950 N-Sec total impulse, 500.8 grams propellant mass)

54mm x403mm: K350-9 (1320 N-Sec total impulse, 682.0 grams propellant mass) K700-P (1430 N-Sec total impulse, 682.0 grams propellant mass)

Jim Cook, Secretary for NAR Standards & Testing <JimCook@AOL.COM>

Jack Kane, Chairman

Missing Scene from Star Wars - from Michael Vezie

Part of a scene that was cut from Star Wars has recently surfaced. It's in the Millennium Falcon, after the escape from the Death Star:

HAN: Listen, I ain't in this for the revolution, and I ain't in it for you, Princess. I expect to be well paid. I'm in it for the money.

LEIA: If money is what you want, then that's what you'll get.

<Leia finds a checkbook in her pocket, grabs a pen, and starts writing a check>

LEIA: <somewhat angrily> One million credits enough?!

HAN: <surprised, then recovering> A million? Uhh.. yeah, that's fine.

LEIA: <finishes writing the check, and practically throws it at Han> There! There's your reward. Enjoy it!

HAN: <takes the check, still a bit stunned about the amount> Ahh, Thanks. <starts to read the check>

LEIA: <to Luke> I wonder if he really cares about anything. <storms off>

LUKE: <watching her leave> I care...

HAN: Hey, wait a minute - "First National Bank of Alderaan"?!?

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

A Cineroc Prang, Only Bigger - A Kometa mapping and reconnaissance payload was lost during the burn of the first stage of its Soyuz-U launch vehicle two minutes after launch from Baikonur. Initial reports suggest a payload fairing failure. The spacecraft was to have spent 45 days in orbit, and would have carried out the SPIN-2 mapping project for US firms as well as imaging for the Russian Ministry of Defense. The Soyuz-U vehicle is built by the TsSKB's Progress factory in Samara and has an excellent reliability record by Western standards.

Hot Streak - Orbital Sciences Corporation has had another launch success, placing the DoD's MSTI-3 satellite in orbit aboard a Pegasus. The bird is actually a 'Pegasus Hybrid' version, a standard Pegasus with modified fins to accommodate the L-1011 carrier plane instead of the original B-52. MSTI 3 will test out new sensor technology for ballistic missile defense.

All Wet? NOT! - A major segment of the International Space Station, which houses the communications and tracking, attitude stabilization, thermal control, and electrical power distribution systems, successfully completed tests in the simulated weightlessness of a special water tank. Assisted by test and safety divers, astronaut teams simulated procedures during a three week test in the Neutral Buoyancy Simulator at NASA's Marshall Space Flight Center, Huntsville, AL. "The test and development of procedures for truss assembly and maintenance mark an important milestone for the Space Station program," said Randy Brinkley, International Space Station Program Manager

Hot Wired - NASA's Tethered Satellite failure review board has reported its findings. According to the board and to scientists familiar with the project, the proximate cause of the TSS-1R tether snapping was because of arcing from the tether to the deployer, burning through the Kevlar which provided tether strength. This happened when there was a high voltage (3500V) between the tether and the deployer. It is believed that the arcing occurred because of contamination in the system, and extreme vulnerability of the system to a single small defect in the tether insulation.

Rebounding, Space Style - While we were out having a ball at MRFF '96, the 87th Ariane launch took place successfully on June 15. An Ariane 44P (an Ariane 4 equipped with four solid propellant strap-on boosters) placed into geostationary transfer orbit the telecommunication satellite Intelsat 709.

Catching Some Rays - Orbital Sciences Corp. successfully launched the fourth Pegasus XL on July 2. It placed into orbit NASA-Goddard's TOMS/Earth Probe ozone monitoring satellite.

Pegasus XL launch delays combined with an on-orbit failure of another satellite resulted in a two year gap in ozone level monitoring.

Flipping Your Lid? - Another Soyuz-U launch vehicle failed to reach orbit on June 20 after 50 seconds of flight. This is the second Soyuz-U failure in a row, following the loss of a recon satellite on May 14. Rumor has it that the payload shroud failed in both cases.

All Strung Out - Aviation Week reports that the May 12 Titan launch carried as a secondary payload the Naval Research Laboratory's TiPS Tether Physics and Survivability satellite. The 53 kg satellite consists of 2 end masses connected by a 4 km tether. The National Reconnaissance Office (NRO) provided funding for the TiPS project.

Step Forward, Step Back - China's Chang Zheng 3 (Long March 3) vehicle made a successful flight on July 3 carrying a commercial US-built Hughes HS-376 model comsat. Apstar 1A will provide communications relay services for APT (Asia Pacific Telecom) Satellite Co. of Hong Kong. The CZ-3 is an older design than the CZ-3B rocket which failed earlier this year.

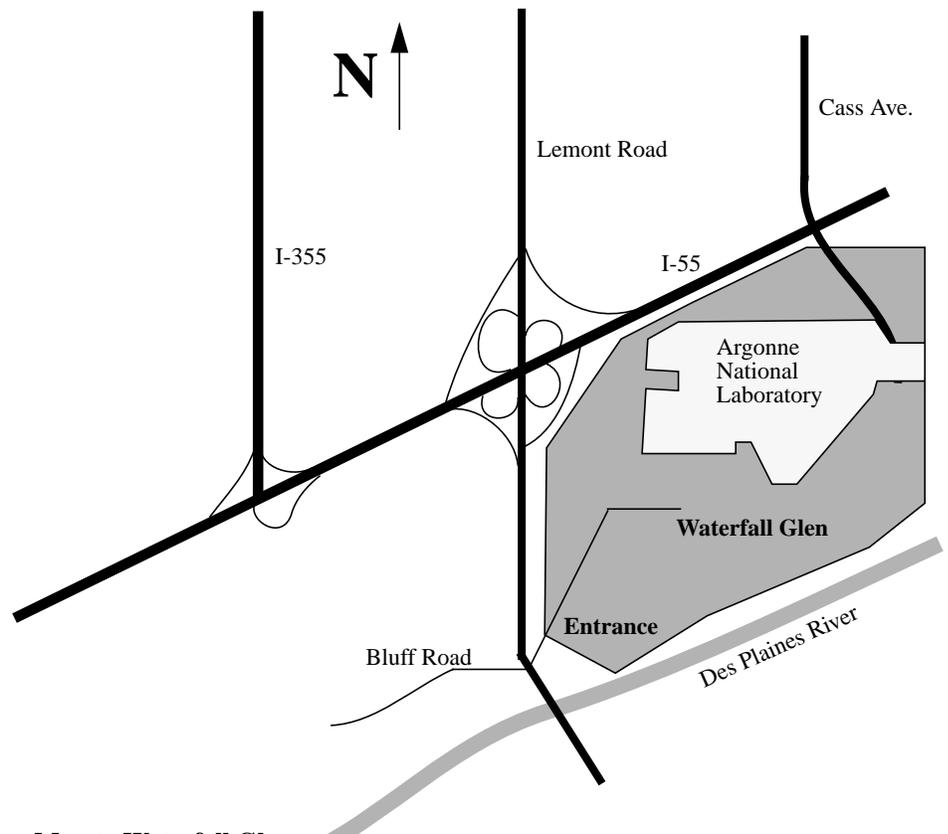
Can't Quite Get There - The Mir complex lowered its orbit on Jul 2 and July 4 to prepare for the arrival of Soyuz TM-24 with the new Mir crew. Mir is now in a 376 x 390 km x 51.6 deg orbit. The ferry ship will be launched by a Soyuz-U rocket instead of the uprated Soyuz-U2 usually used, and the Soyuz-U isn't power-

ful enough to reach Mir's standard orbit.

Moving On - Shuttle astronaut Ken Cameron (Colonel, USMC) will leave NASA on August 5 to join Hughes Training, Inc., as Executive Director, Houston Operations. Cameron first flew as pilot with NAR member Jay Apt on STS-37 in 1991 and served as commander on two subsequent missions, STS-56 in 1993 and STS-74 in 1995.

Action! Take Two! - Arianespace announced a "middle of the first half" of 1997 target date for the relaunch of their Ariane 5 booster. The first flight attempt 'energetically disassembled' (in sport rocket terms, a shred) due to a "complete loss of guidance and attitude information" 37 seconds after liftoff. The failure was traced to "specification and design errors" in the inertial reference system software. The failed launch was estimated to have cost \$160 million.

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Map to Waterfall Glen



As the years drug on, Skywalker began to find Obi-Wan increasingly annoying.