The ZOG-43

The Newsletter of NARHAMS, NAR Section #139.
2001 National Champions

In Memory of the Crew of STS-107

"Their hearts were full of enthusiasm, pride in country, faith in their God, and a willingness to accept risk in the pursuit of knowledge — knowledge that might improve the quality of life for all mankind."

--Statement from the Families of Space Shuttle Columbia

Seated: Rick Husband (commander), Kaplana Chalwa (mission specialist), William McCool (pilot). Standing: David Brown, Laurel Clark, Michael Anderson (misson specialists), Ilan Ramon (payload specialist, Israeli Space Agency). NASA Photo

ZOG-43

Volume 25 Number 3

March 2003

ZOG FORTY-THREE is the official newsletter of NARHAMS the National Association of Rocketry Headquarters Astro Modeling Section # 139

NARHAMS is the oldest model rocket club in theUnited States!

ZOG- Forty-Three is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing the most current, up-to date information on model and real world rocketry, and to provide educational material as well as entertaining information. ZOG FORTY-THREE is published monthly and is available to anyone on a subscription basis. Current rate is $15 U.S. Funds for 12 issues a year, payable to NARHAMS

For more information.....

If you have any questions about ZOG Forty-Three or NARHAMS, or if you have any comment(s), correspondence, free merchandise or if you'd like to submit an article, send them to :

ZOG Forty-Three
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ZOG Forty-Three is edited by Kevin Johnson, and is a six-time winner of the NAR/LAC "Rockwell" Trophy, recognized as the best NAR section newsletter.

Years won: 1969, 1973, 1975, 1990, 1991, & 1992

Zog-43 staff typist is none other then Jennifer Ash-Poole a.k.a. Secretary to the Stars !

Photographs: by Kevin Johnson, except where noted.

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NARHAMS ON THE WORLD WIDE WEB

http://www.narhams.org

Send and receive E-mail with other NARHAMS members through NARHAMS Web page grouplist via yahoo-groups.

NARHAMS serves Baltimore, the state of Md., Washington DC and the surrounding Metropolitan areas. The club is a section of the National Association of Model Rocketry (NAR) and we are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only four time winner of the NAR "Section of the Year" award.

Years won: 1997,1998,1999, 2001

Until recently, NARHAMS members have regularly flown their model rockets at NASA's Goddard Space Flight Center on Soil Conservation Rd. in Greenbelt Md. The launches were open to the public and were held every first and third Sundays of every month (weather permitting), starting at 1 PM. We are working hard to reinstate these launches for the general public.

Sport Launches are usually held the second Saturday of every month at Middletown Recreation Park in Middletown Md. Check the web page for updates.

NARHAMS welcomes all prospective new members to our monthly meetings. They are held on the first Friday of the month from 7:30 to 9:30 PM at the College Park Airport Annex Building. Dues are 10 cents a week, with an initial 50 cents up front (good for 5 weeks) as a sign of good faith.

NEW: Monthly meetings available on-line via chat-room , simply go to the NARHAMS homepage and click on the link.

ZOG ROYAL COURT

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Directions to College Park Airport:

Follow I-495 to Kenilworth Ave. South. Make a right onto Paint Branch Parkway, then make a right on Cpl. Frank S. Scott Dr. At the airport entrance go straight to the Operations Building, the annex building is adjacent to the "Ops" building.

March 2003
Vol 25 Issue 3

Inside this issue:

March 2003 President's Message

(This message was actually written on February 16, 2003)

Wow!!! Looking out the window at about 26" of new snow makes me wonder if the rocket launching season will ever get here. We have been very lucky since the past several winters have been relatively mild. But we are getting hammered this year! So, I close myself up in the rocket building shop in the basement and think about upcoming launches and try not to look outside.

KATIE-1, the first contest of the calendar year, comes on March 8th with all events being flown with Baby Berthas. This should prove to be very interesting and a lot of fun. Even new fliers can compete in this Section Meet without a lot of experience in competition. Of course we will be sport flying that day as well.

March 14th brings our first club meeting at Hobby Town USA in Frederick. The meeting has been relocated so that our many members and other interested rocketeers in the Frederick area can come to a club meeting. Two more meetings are planned later in the year at that location. Come early and do some shopping for your rocket kits and supplies.

So hang in there, the better weather is approaching and we will be back on the range before you know it.

King Zog

From the Editor

I don't often write an editorial for the Zog-43, however with the recent tragedy befalling the Columbia, I wanted to say a few words. People in our hobby, especially those who have been building and flying model rockets since the 60's, tend to be deeply interested and affected by space exploration and manned spaceflight. We all have been moved by the loss of February 1st, as we were moved by the Challenger and Apollo 1 disasters. Our President has stated that this will not mark the end of our space program. There are still mysteries to unravel and hurdles to overcome, and we will face many risks to find the answers and pursue our lofty goals. As NASA works to determine the cause of the accident, my thoughts go out to the families of the crew, and to the diligent many who are struggling to make sense of the available clues.

If you wish to send your sympathy and support to the families of the crew, please sign the online condolence book at http://spaceflight.nasa.gov/feedback/condolence/index.html. For the remainder of the year, I have added the STS-107 mission patch to the the Zog-43 banner. This is my small way to remember the crew.

New Features this Month

There are two new additions to the Zog-43 this month. It brings me great pleasure to be partnering with NASA's Jet Propulsion Laboratory in publising NASA's Space Place column. This monthly column will feature stories about space and space exploration direct from NASA. Also by participating in the program, NARHAMS may be offered posters and other materials to use as handouts at out launches and meetings.

The second new feature this month is a word search. I've tried to include some sort of puzzle or trivia questin in each issue. This puzzle was created online and I think it will be challenging. If you have ideas for a future puzzle, drop me a line at zog43editor@yahoo.com.

Don't forget the rocket design contest! I've extened the deadline for entries through March 14th to make up for the snow days where mail couldn't be delivered. Keep those entries coming for a chance to win a model rocket kit!

January Meeting Minutes

By Chris Kidwell, NAR 45225

Peanut Sport Scale discussion was led by John McCoy.

The meeting was called to order at 8:57 pm by Don Brown

Members attending: Jennifer Ash-Poole, Khim Bittle, Don Brown, Robert Edmonds (arriving at 9:50 pm), Jim Filler, Mike Howie, Kevin Johnson, Chris Kidwell, John McCoy, Mary McCoy, Jim Miers, Paul Miller, Alan Williams

The minutes from the January meeting were read. Motion to accept (Miers/Ash-Poole) passed.

Old Business

Paul Miller did a talk and launch at Millersville Elementary School on November 22 for about 36 kids.

The building session at College Park Airport Museum on November 16 was very well attended. We had 80 participants for the building session, with about 12 club members present to assist. About 40 kids showed up for the launch on November 23 at Goddard Visitor Center.

Khim Bittle did some measurements and estimates Middletown is 12.25 nautical miles from Camp David. The no-fly radius basically disqualifies any possible launch site in Frederick County. Khim is working with the FAA to get an official ruling on why we lose our waiver when the no-fly zone is activated.

Members from NARHAMS will meet with Frederick Parks officials in September to view the new launch site. It should be ready in spring 2004.

New Business

Khim Bittle received a call from College Park Airport requesting that we have a representative attend a meeting on December 11 to discuss the possibility of a change in the operating regulations. The current regulations expire on February 12, and they will almost certainly be renewed, possibly with even tighter restrictions. If that happens, the airport may not be able to continue in operation for lack of business. Alan Williams, Ed Pearson, and Don Brown will attend.

Alan Williams was contacted by Maurice at the Goddard Visitor Center, and they are interested in having us resume bimonthly launches. They need an official request in writing, with an emphasis on it being an educational outreach activity. There was some question as to whether we would have enough club support to start up with 2 launches a month, so we plan to start with just one per month and see how the response is. Jennifer Ash-Poole will talk to DJ, and Kevin Johnson will investigate publicity.

John McCoy reported that System 1 is going to be out for repairs for about 1 week. John will also add drag race circuitry to the competition system.

The club flyer has been updated and redesigned. We will try to keep the following shops stocked: Hobby Works in Laurel (Don Brown), Hobby City in Burtonsville (Kevin Johnson), S&J Hobbies (John McCoy), and Hobbytown USA (Khim Bittle).

The annual building session party at the Filler house is scheduled for January 11. Bring food and a chair. The discussion topic at the January 31 meeting is a competition round table. Chris Kidwell will coordinate the speakers. We will have several tables set up around the room. One person at a time will speak for everyone to hear.

Robert Edmonds will be doing an RC/RG building session sometime in March. He will have a list of parts and costs in February.

Motion to adjourn (Williams/Ash-Poole) passed. The meeting was adjourned at 9:55 pm

Competition Roundtable Held

By Kevin Johnson, NAR 77083

During the first February meeting, NARHAMS members were treated to a discussion of different contest events and strategies. Events discussed were streamer, parachtue, helicopter and glider duration, and cluster altitude. Presenters included Dr. Chris Kidwell, Mark Petrovich Sr., Kevin Johnson, Robert Edmonds and John McCoy. If there is sufficient interest, this event may be repeated nxt year.

Mark Petrovich shares his experience with PD and HD models. Photo by John McCoy.

Dr. Kidwell displays different streamer material while explaining the theory behind SD competition. Photo by John McCoy.

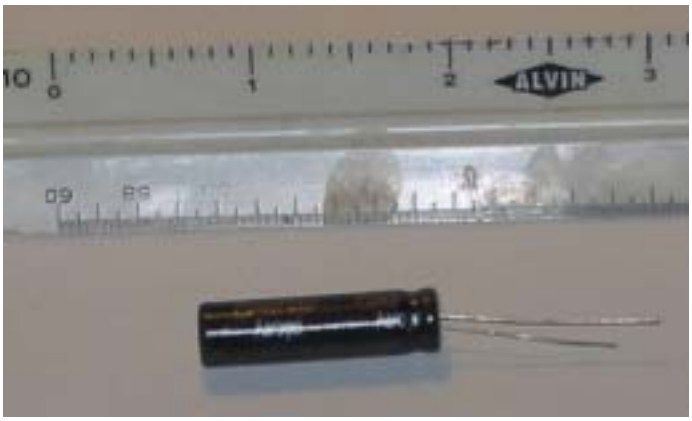
Using Super-Capacitors Instead of Batteries in Rocket Electronics

By Steve Humphrey, NAR 17888

One of the problems in adding electronics to small rockets, say a peanut scale or a parachute duration competition model, is the weight and size of the power supply. While the electronics themselves have become very small in recent years (e.g. the microTimer from www.perfectflite.com, the picoAlt from www.picoalt.com), the battery hasn't kept pace. The 12v "ligher battery" used on Adept and other elctronic units is small and fairly light, but it requires a capacitor to "buffer" a large charge to fire an igniter without collapsing the voltage of the battery and "glitching" the electronics. There are small NiCd cells (e.g. 1/3AAA-size) and small alkaline cells (AAAA-size) that can be used without a buffering capacitor, but they are relatively heavy (10-20 gms), and most electronics require at least three or four of these cells to have enough voltage to operate. (There is a timer used in the Internats competition—the Zitnan timer—that is incredibly small *with* included single cell. But it can only fire a special, very sensitive Daveyfire electric match that is not easily obtained.)

Another problem with batteries is they need to be replacable, in some cases after every flight. Even rechargable cells need to be replacable, if only so they can be removed and put in a recharger. (In theory it is possible to recharge cells *in situ* but few electronic timers or altimeters have this capability.)

While investigating a way to squeeze a staging timer into a peanut scale, 20mm diameter model, I "discovered" super-capacitors. (Actually Terry Dean told me about these caps in a message to the contestRoc discussion group; and Khim Bittle identified a similar super-cap in his NARAM 43 R&D report.) These are fairly new components that have capacities measured in Farads—yes, ***Farads!***—and some of them are quite small. One of the more interesting types employs an aerogel to work their magic (I'm guessing using a fractel-like method of gaining a huge surface area in a small package.)



These super-caps are light, small, and don't have to be replacable. The ones I use are 8mm diameter by 30mm long, weigh about a gram, and can store a 4.7 Farad charge. They have an "equivalent series resistance" or internal resistance of 0.15 Ù, which means they can dump that charge very quickly—at a current of 20 amps or more!

The super-caps have a few disadvantages, though. First, all the ones I've found have moderately low voltage, 2.5v nominal. Second, they need to be charged before use! And third, the capacitors aren't limitless—they won't run a timer or altimeter for as long as some batteries.

The low voltage means either the electronics have to be made of low-voltage components—few do today, though this is likely to change in the near future—or two or more super-caps must be wired in series to multiply the voltage to an acceptable level. When wired in series the total capacitance decreases (for example, two equivalent capacitors will produce one-half the capacitance of a standalone capacitor), while the total equivalent series resistance goes up (in the same example the resistance doubles). Fortunately these super-caps have such huge capacitances and such low resistances that using a small number in series isn't a problem in practice.

Charging a capacitor before use can be tricky, but it also provides a hidden benefit—there's no need for a safety switch or plug! With the capacitors discharged, the electronic device is not energized, so it can't accidently set off the igniter. (However, safety plugs should be used to short low-current igniters such as flashbulbs or Daveyfire electric matches, as these igniters can be set off with stray static charges or strong radio signals if the leads are left open.)

Even if the capacitors are charged on the pad, a very long wait for a launch opportunity may exhaust the charge before the rocket gets off the pad. But the caps are good for many minutes of operating time; the PerfectFlite miniTimer, at 1.5mA operating current, can sit for over 25 minutes powered by a pair of 4.7 Ù super-caps, and still

have enough juice left to fire an Estes igniter. This should be adequate for contest use, where short launch waits are usually the norm. Even waiting for a thermal to launch a duration bird shouldn ~˚$%~˚ t be an issue with 20+ minutes to play with. The PowerStor web page provides an Excel worksheet that can be used to calculate the working time for a given current draw, voltage and capacitor size.

Charging needs to be done with a voltage about the same as the aggregate voltage of the caps. Excessive voltage or current during charging can degrade or destroy the caps. The spec sheet for the caps also suggests that steps be taken to ensure that each cap sees the same voltage drop, for similar reasons.

Oh, did I mention the super-caps can fire an Estes igniter? No more sensitive electric matches or flashbulbs are needed. No heavy NiCds are needed. A single super-cap is enough!

Here's what I've done so far to use these caps. Please note that this is a work in progress. I've flown the boilerplate in a single-stage configuration to test the timer prep & charging procedure and to see if the whole works could survive a launch. My peanut scale model is a two-stage bird powered by 13mm A10s. Since the A10-0 isn't contest certified, I need electronic ignition of the 2nd stage. The body diameter is 20mm; the payload capacity is slightly less, and can be only a few inches long. I bundled two 4.7 Ù super-caps side-by-side and wired them in series with a PerfectFlite miniTimer. I soldered a small Molex .100" socket across the capacitor leads for a charging "port". I added two more Molex sockets to the timer for connecting the igniter and a burn-wire. These Molex sockets are available from www.digikey.com as part number WM3200-ND.

I wanted to use a G-switch instead of a burn-wire. However, the miniTimer requires that the switch be closed for at least 0.5 seconds, and the A10 doesn't impart the needed 2 G's of force long enough to trigger the timer's launch-detect circuit.

The entire package is enclosed in a 3" piece of BT-20, with a #2-56 machine screw sticking out of a bulkhead at the forward end. This allows the package to be screwed into the base of the nose cone. The BT-20 is thus the shoulder of the nose cone.

The charging socket is positioned so that the nose cone needs to be raised only a fraction of an inch to give access for a charging plug. The igniter and burn-wire sockets are in the base of the tube. Long igniter leads are plugged into one socket and run down inside the airframe and along side the motor mount. The burn-wire is plugged into the other socket and likewise runs down the inside of the airframe. It exits through the rear of the upper stage and down the outside of the booster airframe and across the nozzle of the booster motor. This isn't an ideal arrangement, as the burn wire might foul the booster at staging. I may have to tinker with this wire arrangement. At ejection the leads are pulled from the socket.

The charger is a small box with a toggle switch, a momentary-on pushbutton, an LED, a 2-foot pair of wires with a Molex plug soldered to the ends, and a battery. The toggle switches between the battery and a dead short. The pushbutton either energizes the Molex plug (toggle turned "on") or shorts the plug (toggle turned "off"). I use the shorted position to discharge the caps. The LED lets me know the plug is energized. When I charge the PerfectFlite timer, I hold the pushbutton down until I hear the timer cycle through it's beeps that indicate it has turned on, has a good igniter, and has a burn-wire connected. After running a few test charges, I've found that when the timer has finished its startrup sequence, the caps are fully charged.

I have yet to fly the timer in a "full-up" configuration. I've run several bench tests and have burned about a dozen Estes igniters verifying that the timer & capaciters work correctly. Assuming further is successful I will fly the electronics in my peanut scale entry at ECRM-30.

KATIE-1 Rules Clarification

By Don Brown, NAR 70318

Being the Contest Director for KATIE-1 and also having been in attendance at the planning meeting where the idea was first presented, I will give you the only interpretations of the "gentleman's agreement" concerning model construction that I intend to use for this contest.

1. At the planning meeting it was suggested that we build a contest around Estes Baby Berthas so that as many people as possible could compete without having to be especially skilled at competition model construction or have to purchase expensive competiton kits.

2. It was agreed at the meeting that the models would be STOCK Estes Baby Berthas with minor internal modifications as desired by the competitor. It was also agreed that the model would look like a Baby Bertha from the outside. That meant and still means to me that no structural modifications would be done to the body, nose cone or fins. A paint job, clear coating, minor airfoiling of fins, fin filleting, waxing or any other finishing technique that does not change the basic construction is acceptable. A handout was made available at our meetings that gives the dimensions of a Baby Bertha so that anyone could duplicate its construction without having to buy a new kit. This was intended to allow you to use body tubes, balsa and nose cones that you might already have at home.

3. Internally you can do things like eliminate the metal motor hook, stuff in a huge chute or streamer, drill lightening holes in the bulkheads, use special shock cords or make any

Continued on page 11...

Calendar of Events for 2003

Feb 28 - Monthly meeting, Baby Bertha building session
Mar 8 –Katie-1 Section Meet (HQSM-37)
Mar 14 - Short meeting then building session, Hobbytown USA Frederick, MD
Mar 22 Painting party, McCoy house Washington, DC
Apr 4 Monthly meeting, 1/4A BG building session
Apr 12 -OPOSSUM-7 Open Meet
Apr 27 -Rockville Consortium of Sciences Rockville, MD
May 2 -Monthly meeting, altitude prediction talk
May 10 -Team America Flyoffs, Great Meadow The Plains, VA
May 17-18- ECRM-30 Regional Meet
Jun 6 -Monthly meeting, making decals
Jun 14 -Sport launch
Jun 21-22 – MARS 29 Regional Meet, Great Meadow The Plains, VA
Jun 27 -Monthly meeting, UFO building session
Jul 12 -Sport launch, UFO theme
Jul 20 - Centennial of Flight launch
Jul 26 -Short meeting then building session, Hobbytown USA Frederick, MD
Aug 9 -Sport launch
Aug 15 – Monthly meeting, Night Launch for Newbies
Sep 5- Monthly meeting, elections, pirate building session
Sep 13 -Sport/night launch, pirate theme 12:00 pm start
Sep 28 -AIAA launch Columbia, MD
Oct 3 -Monthly meeting, electronics
Oct 11 -Sport launch, Oktoberfest V-2 day, picnic launch
Oct 11-12 -SCST-3 Jonesburg, PA
Oct 17 -Short meeting then Skywriter building, Hobbytown USA Frederick, MD
Oct 25- Planning meeting College Park Airport
Nov 8 -Sport launch, writing implement theme
Nov 14 -Monthly meeting, finishing techniques
Nov 22 - Centennial of Flight display College Park Airport Museum
Dec 5 -Monthly meeting, pot-luck holiday party
Dec 13 -Sport launch

Sport launches are held at Middletown Park from 10am-4pm, waiver up to 3.3 lbs and "G" motors not exceeding 62.5 grams of propellant. All flights "E" power and above are restricted to 5 degrees from vertical and between the hours of noon and four PM. Call ahead to confirm launch and waiver availability.

Business meetings are held at the College Park Airport Annex Building, **except where noted above**. Meetings begin at 7:15pm with building sessions or presentations and last until 9:00pm or so. Regular Business meetings follow until 10:00pm. If no presentation or building session is scheduled, please bring whatever project you are working on currently.

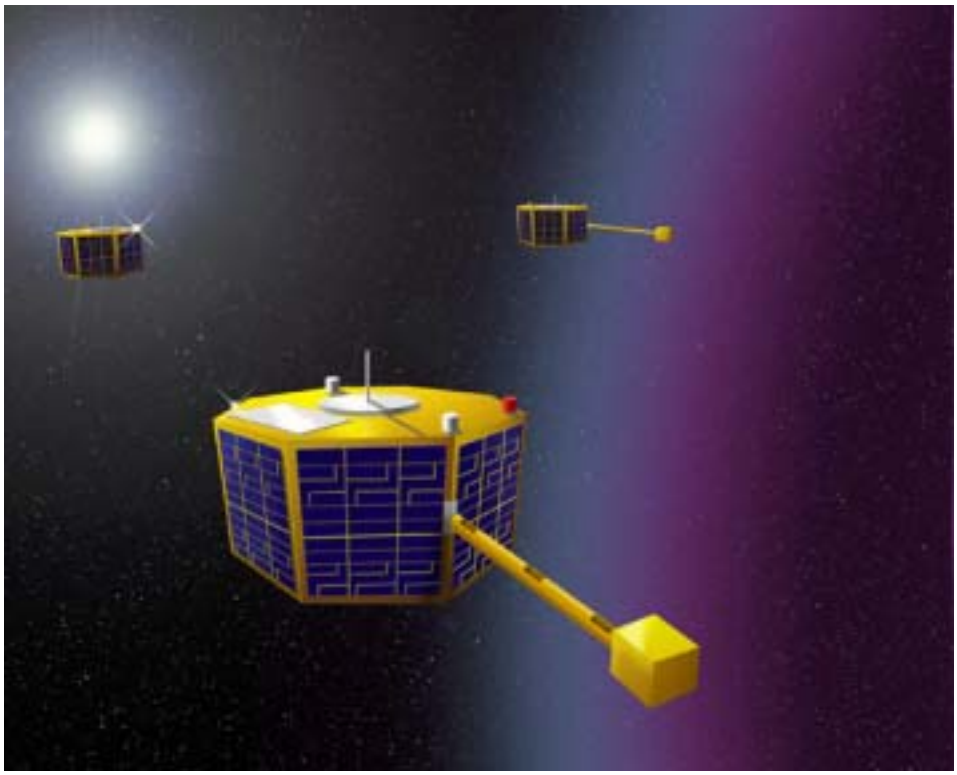
Questions? Call Club President Don Brown at 410-781-7539 or visit NARHAMS online at http://www.narhams.org

NASA's Space Place

Frisbees in Space by Dr. Tony Phillips

When Pete Rossoni was a kid he loved to throw Frisbees. Most kids do-it's pure fun. But in Pete's case it was serious business. He didn't know it, but he was practicing for his future career " in space exploration.

Grown-up Pete Rossoni is now an engineer at NASA's Goddard Space Flight Center. His main project there is figuring out how to hurl spacecraft into orbit Frisbee-style.



The spacecraft are small-about the size of birthday cakes. "This wouldn't work with big satellites or heavy space ships like the shuttle," notes Rossoni. But a cake-sized "nanosatellite" is just right.

Nanosatellites-nanosats for short—are an exciting new idea in space exploration. Ordinary satellites tend to be heavy and expensive to launch. The cost alone is a deterrent to space research. Nanosats, on the other hand, can travel on a budget. For example, a Delta 4 rocket delivering a communications satellite to orbit could also carry a few nanosats piggyback-style with little extra effort or expense.

"Once the nanosats reach space, however, they have to separate from their ride," says Rossoni. And that's where Frisbee tossing comes in".

Rossoni has designed a device that can fling a nanosat off the back of its host rocket. "It's a lot like throwing a Frisbee," he explains. "The basic mechanics are the same. You need to impart the spin and release it cleanly-all in about a tenth of a second." (The spinning motion is important because it allows the science magnetometer to measure the surrounding field and lets sunlight to play across all of the nanosat's solar panels.)

The ST5 nanosats are designed to study Earth's magnetosphere-a magnetic bubble that surrounds our planet and protects us from the solar wind. But their primary goal, notes Rossoni, is to test the technology of miniature satellites.

"We haven't done anything like this before," says Rossoni. Soon, however, the concept will be tested. A trio of nanosats is slated for launch in 2004 on the back of a rocket yet to be determined. The name of the mission, which is managed by JPL's New Millennium Program, is Space Technology 5 (ST5).

Can groups of nanosats maintain formation as they fly through space? Will their internal systems-miniaturized versions of full-sized satellite components-satisfy the demands of both the harsh space environment and critical science measurements? Is Frisbee-tossing as much fun in orbit as it is on Earth? ST5 will provide the answers. Read about ST5 at at http://nmp.nasa.gov/st5 . Budding young astronomers can learn more at http://spaceplacenasa.gov/st5/st5_tortillas1.htm

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

The 14th World Spacemodeling Championships

Sazena, Czech Republic
October 11-20, 2002

By Mark Petrovich, Sr, NAR 29160
Part 4: Competition Continues

Thursday was a new day full of flying. This day I would assist James Duffy with his S5C Scale Altitude model, a Bumper WAC. The evening before we had checked his staging system and tried desperately to get it to work. For some reason, it would not fire an igniter and we were faced with only one option, Stine Staging.

The weather was good, as far as days in October go, and there was promise that the event would go well. Despite problems with the electrical timer, we prepped the Bumper WAC as well as we could for the change in staging. We took a long time to prepare for the flight and were able to get to the pad in Round 1. James was nervously preparing his work of art and I tried my best to keep him focused. The model flew in round one and failed to stage, falling to the ground instead for a DQ. Dr. Bob had a good boost but the staging failed and a disastrous crash almost destroyed the V-2 portion of his model. A rebuilding crew was assembled and he was able to fly Round 3 with a qualified flight. James suffered another staging mishap in Round 3 to finish his Internats experience on the low side. If his staging timer had worked the night before, the results could have been different. With any rocketry experience, there is no room for "ifs" only successful flights. I knew that all too well after S1.

The highlight for the day was the S9 event. Kevin Kuczek was able to garner a Silver medal for the US Team after some great flying and fantastic recovery efforts by James, Bob, myself, Dave O, and Phil and Chad on long range. We were spread out, in that order, downwind of the launch area and could easily track the models as they flew from station to station. I think this effort eclipsed those of the S3 deep recovery team by a landslide. The team was not only the guys in lane 13 but also those spread all the way out from the launch area to the fields of the Czech Republic. What a wonderful effort!

For the first time, we watched an American take the podium and the Stars and Stripes ride up the flagpole. Were we proud? Shucks, I think so!

Scale Day was Friday and all sorts of beautiful models reached skywards. Some didn't make it and others put on a spectacular show in not making it. Several models could not handle the strain as they folded in half and spit their motors out in a pall of smoke and fire. Others had cantos and rained parts all over the launch area. Bob Biedron, the premier S7 modeler for the US, had a great first flight but one of the judges saw a part leave his model early and not deploy a recovery device for a DO. Tom Campbell's Saturn 1B left the launcher and seemed to lose power as the E30 chugged. The model came down and received extensive damage. George Gassaway's Shuttle was a piece of work and, had it not been for the sound of another country's model detonating, I would have never seen it. I heard the launch of the model and then the RSO's frantic voice warning everyone of the impending crash. I was out of the tent in a shot to see a trail of smoke going up then arcing over to head down. I hoped that was not a US bird.

I walked to the launch area from the tent and heard another countdown. With my video camera in sleep mode, all I could do was watch as the Shuttle lifted off in a roar of smoke and flame. The stack just began to arc over when the S.B.'s separated. A moment after, the shuttle and ET separated, the former beginning a gentle glide. All the parts from the stack deployed recovery devices and the shuttle glided in for a smooth landing for a qualified flight. What a sight it was!

Meanwhile, a team of builders began assembling Tom's Saturn 1B. The damage was severe and the team worked feverishly to put it back into flying order. Bob was in the British tent preparing his model for a second flight. The second round started and the teams were still at work. Nearing the end of the round, the teams hustled out to the pads to get the last flights in. Biedron launched his Ariane for a second flight, the staging took place as scheduled but the RSO's ¡§Disqualified¡¨ rang out loud and clear. His first stage failed to deploy its parachute and his bid for a good flight was over. Now it was all about Tom's Saturn. The team hastily went to work hooking up the igniter clips. The signal was given to fly and the RSO counted down. "NOT READY," the RSO called when the button had been pressed and nothing happened. The team scurried around, trying to get continuity in the ignition circuit. The tension was thick, time was running out and the US needed another flight. They got another count, pressed the button and NOTHING AGAIN! Then the RSO signalled the end of the round.

The team tried so hard to get that flight off that all of us felt the loss. We milled about for a few seconds to get our wits and helped Tom and the rest of the S7 team breakdown the range. The 14th World Spacemodeling Championships were over.

The Zog-43 April Astrobulletin

By Paul Miller, NAR 51615

April is going to be one to remember this year. OK FOOLS lets get those Cruise missiles out of your rocket collection! Don't forget those Patriots and Scuds you built back in the early '90s too. The new MOON is on April 1st, I kid you not. This dark sky is a good time to step out with a 'scope and grab some starlight.

As our brains are slowly warming up from that cold winter, we welcome DST. On Saturday, April 5th don't forget to rush around to your timepieces before bedtime and SPRING forward. This means you will lose one hour of valuable rocket-building time. Don't be too upset, you will gain that hour back while designing your Star Wars costume in October.

We will proceed chronologicalalt this month (APril): Keep a special eye-to-the-sky 'cause we may have some special events not mentioned here.

- On the 11th: We had a devastating tornato in Frederick, MD in 1790. Apollo 13 was launched in 1970; and Jupiter will be 4 degrees south of the Moon at 4:00 am in 2003.

- On the 12th: Yuri Gagarin was first Earth human in space in 1961.

- On the 13th: The first captured V-2 rocket launched from White Sands, NM in 1946; "Houston, we have a problme," the Apollo 13 Command Module Odyssey fuel cells/oxygen tanks cancel a Moon landing in 1970.

- On the 16th: Mercury will be at greatest elongation looking west 13 degrees above the horizon 30 minutes after sunset. This will be Mercury's best presnetation of this year. The last average frost date for the College Park area is today, but don't count on it.

- On the 17th: The Apollo 13 crew safely reutrns to the Earth in 1970.

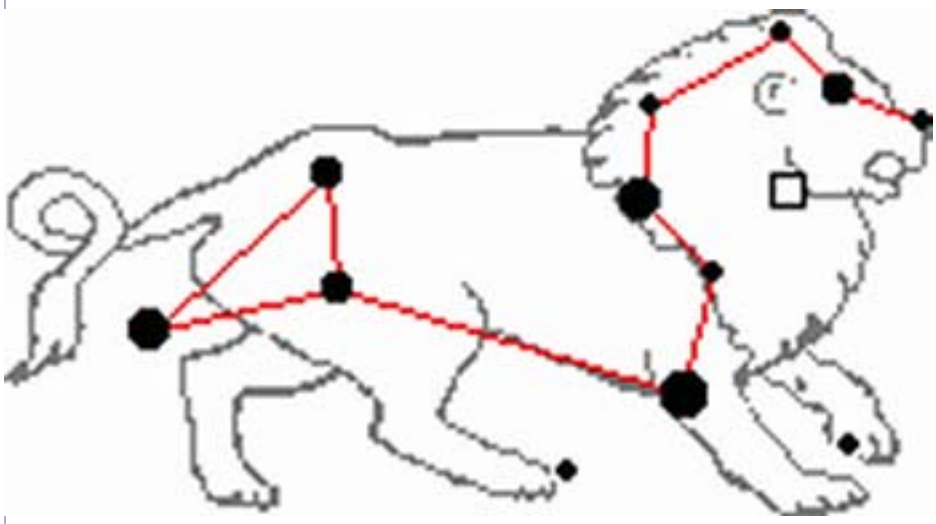
- On the 21st: The Lyrid meteor shower peaks about 10 per hour through the 22nd. Lyra is the radiat.

- On the 23rd: The Moon passes 3 degrees south of Mars at 2am.

- On the 25th: The Hubble Space Telescope is finally deployed in 1990.

- On the 28th: The F4 tornado blasts La Plata last year.

Leo is our constellation of the month. Leo is easily found by its famous "sickle" or backwards question mark with Regulus the Alpha Star, at the bottom. Leo is below the Big Dipper. Regulus lies just below the ecliptic so planets often cruise past it. Supposedly, Regulus is the heart of this lion. Frankly, this is one of the few constellations where even visually impaired such as myself can actually imagine the outline of the animal. Denebola, the Beta star is the apparent tail of the lion. The Gamma star is Algeiba which helps form the lion's mane. It is an easily split binary of orange-yellow stars, and can be a worthy target with your telescope. Leo boasts a rich field of galaxies. Ad Astra!



The ZOG-43 Rocket Design Contest!

Submit your rocket plan to the Zog-43 and not only will it get published in the newsletter, but you get the chance to win a free rocket kit!

The Rules: You have until March14th to get your rocket plans to the editor of Zog-43. Plans can be sent either by mail or email. You can enter as many plans as you want, but only 1 will be chosen as the winner.

Judging will be done by the editor and 2 assistants, and the winner will be announced and published in the April issue of Zog-43.

The Prize: A rocket kit similar to the raffle prizes available at club meetings.

Good Luck!

K- Series Kit Name Scramble

by Kevin Johnson, NAR 77083

Find the names of Estes K-series kits in the grid below. The names can be found horizontally or vertically.

S F A L C O N D E M O N X R A Y H T R D
M E K I S O F A R S I D E X N C O B R A
D E L T A T L P S T A R L I G H T I T R
F S E T T B G O B L I N M E O O S G O C
A B N L U R T G T H O R A G E N A B R A
R C H E R O K E E D S P R I T E I E B S
S S B J N A V E N G E R S J R S N R I T
I K U O V S T I N G E R S M D T T T T A
D Y G E M I N I T I T A N A F J E H A R
E D R I F T E R W A C C O R P O R A L B
B A S I T S K Y H O O K O K S H C N T L
I R T N O P E S P A C E P L A N E R R A
R T R V M A R S L A N D E R E T P E A Z
D S E A E C M E C U R Y R E D S T O N E
I H A D G E M H G A L P H A N T O M S R
E R K E A M A R S C R A M B L E R S P A
H I N R S A T U R N I B M A R K I I O N
A K T S A N D H A W K B A N D I T S R G
P E S C O U T M I D G E T R I D E N T E
S P R I N T G Y R O C S A R O S P E V R

Mark II
Space Plane
Ranger
Spaceman
Farside
Drifter
X Ray
Gemini Titan
Alpha
Thor Agena B
Starlight
Saturn IB
Midget
Mars Lander
Cherokee D
Interceptor
Stinger
Sky Dart

Mark
Streak
Phantom
Cobra
Farside X
Sprite
Invader
Big Bertha
Arcas
Little Joe II
Trident
Scrambler
Mecury Redstone
Birdie
Bandit
Sandhawk
Saros
Demon

Scout
Apogee II
Sky Hook
WAC Corporal
Falcon
Delta
Mars Snooper
Gyroc
Honest John
Star Blazer
Saturn V
Avenger
Orbital Transport
Shrike
Sprint
Omega
Goblin
SPEV

Continued from page 7...

other MINOR modifications that you feel will enhance the performance of a stock kit.

4. These guidelines are printed in the description of KATIE-1 in the Calendar section of our website. Since this is a "gentleman's agreement", I would expect that all of the regular competitors would stay within the agreed upon guidelines so that newer contestants could also have a good chance at winning an event.

5. As we have seen before, these "gentleman's agreements" have been loosely enforced and those who stray beyond the intended limits of the "agreement" have not been penalized or banned from the contest. Their punishment has been some booing or raised eyebrows. So be it in this contest. If you feel that you absolutely MUST use special body tube, fin or nose cone material to win the events, then do it. I will not eliminate you. But you will certainly not be competing in the sense of true sportsmanship that was intended for this particular meet.

6. I volunteered to be Contest Director for KATIE-1 since it is a relatively simple concept that I thought would be fun as well as competitve. I never thought that a controversy like this would arise about the construction of the models. But,it is what it is and I cannot change that. I am sure that everyone will not agree with my handling of this matter, but the Contest Director is not always popular.

7. If anyone in the club finds any iregularity in my interpretation and implementation of the "gentleman's agreement" that violates any NAR contest rules, please make me aware of the problem immediately. Otherwise the contest will be run under the guidelines that I have written above.