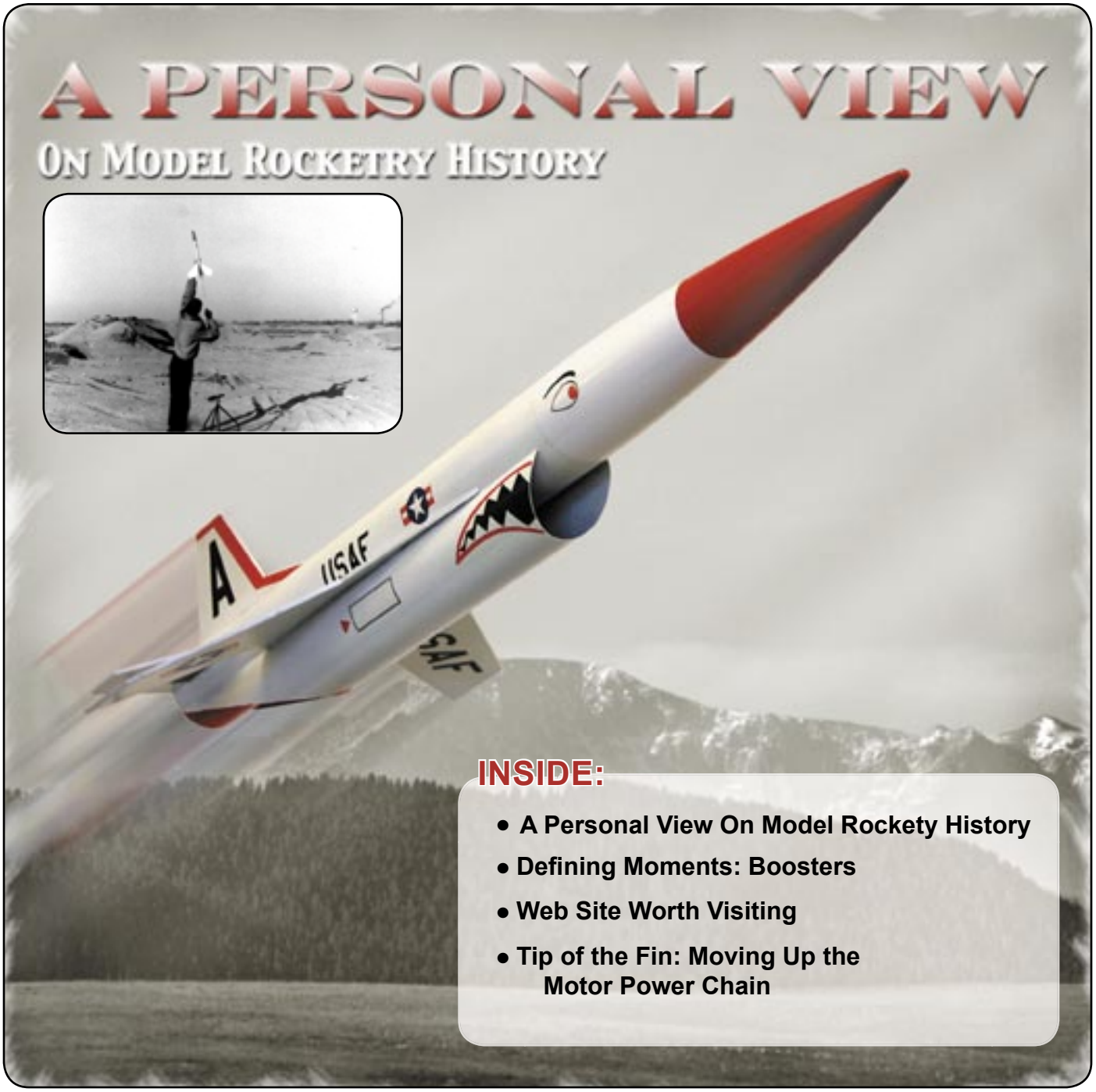
ISSUE 181 - April 10, 2007

APOGEE PEAK OF FLIGHT NEWSLETTER



INSIDE:

- A Personal View On Model Rockety History
- Defining Moments: Boosters
- Web Site Worth Visiting
- Tip of the Fin: Moving Up the Motor Power Chain

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A Personal View
on Model Rocketry History

by Ned Hood
(edited by John Manfredo)

An Early Pioneer Takes a Look Back on His Rocketry "Career"

Early Model Rocketry

In the late summer of 1958 my friends and I were walking across the baseball field near our home in Beverly, New Jersey when we heard a jet-like sound and saw a white object shoot into the air from the end of the field. We watched it go up almost out of sight, and then a red parachute popped out in a white puff of smoke! It glided slowly down and landed on the infield. We went over and saw that it was a small white rocket with a gray nose cone, powered by a short, brown colored motor.

I was an early rocketeer - way back in the Roc-A- Chute days!!! (1958 or so)

A local doctor whom we all knew, and his son came running over and said this was the first time it had been fired. The man and his son put the 'chute back in, installed another motor, put it on a three foot metal rod, and launched it again. It was impressive, and to me (a 13 year old who followed the new "space race" religiously) it was something I had to have! I found out where to order the rocket (called the "Rock-A-Chute") and motors. I mailed it out to Model Missiles in Colorado and it seemed like forever until the kit arrived. After putting it together, I flew it a dozen times and soon we were in our own space race with the doctor and his son! Using the only available motors back then (which were A's), the Aerobee rocket flew straight and went to about 500 feet. We had to go higher!

In March of 1962 we made a rocket that was powered by a Coaster black powder motor and was about 24" long.

That weekend, I made a drawing of the rocket with two motors. It looked like the bottom of the Atlas ICBM, but with two motors, not three. My dad took some red construction paper, and used white glue to make a tube that was wide enough to hold two motors. Then he tapered it to the same diameter as the rocket body. We had a booster! I cut and glued three fins onto the body (I didn't know about finding the CG/CP yet, but lucked out.).

There was a small metal tube that held a Jetex fuse running into the upper stage motor from the booster. We had to light the two booster motors and the top fuse with a match! The first time the two booster motors ignited right away, but the upper stage

Summer of 1962, this is our first 2-stage F-powered rocket. Using Coaster black powder motors, this rocket flew several times before the upper stage was destroyed by a motor failure halfway through the burn.

continued on page 3

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continued from page 2

didn't. It crashed down next to the launch rod, while the doctor's son watched and laughed. No damage was done as it only went about 30 feet up. On the next attempt only one booster motor ignited, resulting in a short flight into the grass 50 feet away. With broken fins on the booster, we went home to repair the rocket.

Launch of our first Enerjet F100 powered rocket in early 1972.

The next day we tried again. This time it actually worked! It went straight up and although the upper stage ignited at an angle, the chute came out and we recovered it with no damage. We flew it a few more times with some spectacular flights. The motors were expensive and with my limited funds from cutting grass in the summer, I couldn't buy many. I do remember the doctor's son had a huge box full of motors, but he would have to wait for his own two-stager!

More Thrust to Get Up There

With my dad making the body tubes, we made many rockets of different sizes and fin configurations over the fall and winter months. The "super" motors (B-type) became available, so we had additional power. I don't recall when the zero delay booster motors came out. We also used black power skyrocket motors (from fireworks) and of course, CO2 tubes with match heads (do not try this at home!) as well as zinc dust and sulfur, in attempts to get more thrust. I found a hobby shop in a nearby town that began to stock the motors and some basic supplies. Sometime in early 1962 w found the Coaster Corporation and their powerful black powder 20, 30 and 50 pound thrust motors, which were F11's. I built many large rockets during the early 1960's; all were designed on our kitchen table and built in our home workshop. We made all the body tubes, fins and nose cones, but purchased the parachutes and motors.

I built several two stage rockets that used a 50 pound thrust booster with a 20 pound thrust upper stage. They were the F15-0 and F11-5 motors, respectively. These became our basic high altitude rockets and they certainly were more interesting to fly then the A's and B's. It was not unusual, however, for these early motors to CATO either at liftoff or at second stage ignition. I had many hours of building destroyed when they exploded.

The Launch Site

Our launch site had to be one of the best on the East Coast. It was an area located along the Delaware River, just over one mile long, over a quarter mile wide, and about 40 feet high. It was all flat and treeless with white sand and river rock! While there were houses about 300 yards away on the east side, we had no buildings at either end and the mile-wide river on the west. It was remote, difficult to drive to, and had a 360 degree view in all directions. This place was just perfect for our launches, so we called it *Sand Dunes Proving Grounds*.

Since we almost always launched in the early morning when the air was calm, we drew a lot of attention when we fired the larger motors. Quite often, small planes would fly over to our site after seeing the white smoke high in the clear skies, which caused us to hold

Photo of Ned in 1962 placing a rocket on the launch rod at the launch site along the Delaware River in Beverly, NJ. The tank and smokestack on the right are actually across the river in Pennsylvania.

continued on page 4

continued from page 3

a launch until they left the area. We had military planes from McGuire AFB fly over as well. An ANG C-119 "Flying Boxcar" actually buzzed us at about 50 feet after we had launched a large multi-stage rocket well over a mile high on Saturday morning.

The local police often stopped by also if they heard something, but we never had a problem. You see, I had all the permits and letters from the New Jersey Department of Labor and Industry, which issued the permits for what were considered explosives back then. With very little wind (and when it did blow, it was from the west), we never lost anything in the river. I always wanted to build something to launch from New Jersey, fly all the way across, and "soft-land" on the Pennsylvania side! I designed a three stage vehicle as well but never built it...maybe someday.

Launch of a small B-powered rocket glider.

Early Rocket Payloads

Payloads were being added and we launched the standard mice and insects, which all survived. We had tried smoke bombs that were used to find leaks in ventilation systems as tracking aides as well. We dumped shredded aluminum foil out when the ejection charge went off. We also had a few night launches with penlights (which didn't work real well) and railroad flares (which did work but were a serious fire hazard!).

Right before Halloween, we built and launched a large two stage vehicle that carried a smoky green flare on a parachute that deployed at apogee. We launched this four foot tall, F-powered rocket from my backyard into the dark, moonless sky. It worked just great and the weird green glow moved very slowly over the town from about 2,500 feet. The next day the local papers both reported the "UFO sighting over Burlington County"!! I didn't tell my parents about this for 20 years!

We Also Did Some Real Science...

One of my best friends, John Carroll, who was of direct German descent (we called him "Werner" of course) built a small, battery powered radio transmitter that we installed in a F- powered rocket. To keep the costs down, it broadcasted on the low end of the AM band, where we could track it on my dad's '53 Chevy car radio. It was pretty powerful, the range was about 1.5 miles on the ground, and that Beep-Beep-Beep became louder and louder the closer you got to the landing spot. From the projected 1500 feet up, it would have covered the entire town easily!

Before we would commit a real 8mm movie camera to the dangers of rocket flight, we mounted a weighted dummy camera in the payload section to test the configurationand recovery design. This rocket used a cluster of 2 Coaster F motors, and eventually carried the real camera on four flights to about 1200 feet.

The first launch went up to about 50 feet, then nosed over and headed east towards the side of the launch site that did have the houses, at well over 200 mph. We jumped in the car and went looking for it! After 15 minutes we headed right down the center of the development. The beeping was getting louder and louder as we stopped in front of a house that seemed to be in line with where we saw the rocket head. In the back yard was a man raking leaves and we asked, "Did you see a rocket fly over this way from the sand dunes?" He responded by opening a large metal trash can and pulling out the still smoking and beeping rocket remains! He said, "That thing crashed in the yard and I didn't know what it was!"

The man was my high school guidance counselor

continued from page 4

Taken in May 1973 showing the upper stage of a 2-stage, F-powered vehicle, prior to test launch using an F100-12 motor.

who recognized me in school the next week! The transmitter was used many times afterwards. We won first place in the Burlington City High School Science Fair that year with the transmitter beeping away through a speaker on our display (shades of the "Rocket Boys"!).

Cameras, cameras, cameras...

Long before the Estes Cineroc, I built a large rocket to carry an 8mm movie camera. The body was a three foot, 4" diameter tube, with a payload section that had the sides cut through to allow the one pound, plastic case Kodak "FunSaver" movie camera to slide in facing down. It used two Coaster F11-5 motors mounted side-by-side for power. The rocket had three large silk parachutes; two on the camera section attached to the nosecone (which swung around at separation and allowed the camera to continue to point at the earth), and a large, single 'chute on the body to recover the booster. We first built a dummy camera out of plywood, to test the configuration and lifting capability of the motors – no RockSim (http://www.apogeerockets.com/rocksim.asp) yet!

On the first launch attempt the igniter cables hung up on one of the fins, so the rocket lifted off taking the cables and part of the firing panel up with it. The model didn't get too far with that 50 foot tether as it crashed down, pretty much destroying the bottom section. I wish I had film of that one! The model needed to be rebuilt, but at least the nose section was OK. The next test flight went fine up to about 500 feet above the ground. It was time we went to the real camera, which was certainly my most nervous launch to date!

For some reason, we chose to fly this from another site: a state park that had a 10 acre clearing surrounded by dense woods. The launch sequence was as follows:

1. Hook-up and test the car battery powered igniter system.
2. Install the igniters in the motors and put them into the motor mounts.
3. Slide the rocket body onto the 6 foot launch rod.
4. Install the camera.
5. Hook up the clips.
6. Turn on the camera.
7. Run back to the firing panel.
8. Pull out the safety key.
9. Count down from 5, hit the button, and then try to shoot some 35mm film as it launches.

The launch went off without any problems other than the booster chute not fully opening. The color film was excellent! You could see the smoke at liftoff, the pad dropping away very quickly, the people watching, and the entire park from about 600 feet. There was a lot of bouncing as the shock cords absorbed the opening of the 'chute, then it settled down as the camera section drifted down and got caught in the tree tops! I flew it two more times, but it was a tricky thing to fly and it couldn't fly higher with the existing motors, so when the Cineroc came out, I bought one.

Other Payloads Flown:

- Long (25') foil recovery streamers
- Nose cone with "A" motor in it to attempt to hit a target on ground
- A winged nosecone to explore a glide recovery – needed R/C
- Tape recorder – just a lot of noise
- One attempted launch from helium balloons – too unstable
- Radio with mic – more strange noise
- A Para-foil type chute for recovery – smooth, but hard to control
- Helo-type blade for recovery – too much space taken up
- Of course cherry bombs, Roman candles, sparklers and flares

continued on page 6

continued from page 3

Things we tried:

- Spin stabilization with angled motor mounts;
- All kinds of Styrofoam parts;
- 4, 6, 8 motor clusters;
- Launch at 30 degree angle, gliding down range recovery;
- Rocket Mail between to towns; "Flown By Rocket from Beverly to Edgewater Park, NJ";
- Flashbulb igniters, as seen in a rocketry magazine
- Flashbulb at apogee at night
- A four stage rocket with: F11-0, D12-0, C7-0, C7-5 with fuse delay ejection
- Two 50 pound thrust motors, mounted on a light-weight bicycle

Mixing Your Own

I did experiment with making my own rocket motors. In the late '60's we could mail order large quantities of zinc dust, sulfur and potassium nitrate for very little money and have it shipped our your door (what's a HazMat?). You can generate lots of thrust but it is *very dangerous* and more costly today. While there are lots of stories regarding this, I did manage to blow out all the windows in our workshop – twice. There's no point in going this route when now there are so many SAFER, more reliable ways to power your rockets today (I do have all my fingers and plan to keep them).

1970's

With a family and a demanding career (I almost went to NASA in 1968, but I couldn't afford the pay cut to start at Wallops Island), my rocketry progress slowed. I built a lot of the new kits and did rocket gliders and boost gliders. I loved the flight systems.

I built a large boost glider using a store bought styrofoam plane with a 30 inch wingspan, powered by a EnerJet long burning E motor in a pop pod. The first few flights were really spectacular. Once the plane arced over at about 12 feet and roared down range with that E motor shooting flame and smoke like a Kamikaze! It went about 50 yards, nice and level, picking up speed, and then started losing parts. Both wings and then the tail came off until it crashed.

Not a true glider. But new models, with some wing changes, re-enforced areas, and aluminum foil on the tail, flew great with that E motor. I actually lost one that was carried off by a thermal in August 1973 and was brought back three years later by a kid who found it in a field 6 miles away. I always put my name and address on them, but this is they only lost rocket that ever came back. I wanted to mount my Cineroc in the belly of one of these boost gliders and add R/C but never got to do it.

I have also built some newer high power kits over the past 5 yrs or so. Finding space for launching the large ones is getting tough on the East Coast! I am looking toward getting back into the hobby as I have a 17 year old son to work with!

About the Author

Ned lives in Lumberton, NJ with his wife and 17 year old son. He has worked in the printing industry for over 30 years, with his main focus on digital color technology and Print-On-Demand publishing. While not as active in model or amateur rocketry as he once was, he still tries to keep up with the hobby and hopefully, will have time to continue my interest in high power rocketry.

Question & Answer

Rod G. asks, "I just purchased some Aerotech E30's for a three cluster rocket (I have used Estes E9's successfully in the past), however, the instructions on the igniters say not to be used in clusters. Is there an alternative igniter I can use in place of the copperheads?"

Yes, the suggested igniter for clustering would be the First Fire Jr.'s: http://www.apogeerockets.com/Aerotech_motors.asp#First_fire_anchor. They have the 2 wires that you need for cluster wiring, plus they are more reliable to ignite together. As far as a launch controller, you will need one that uses a good 12v source like the Pratt Go Box: http://www.apogeerockets.com/go-box_controller.asp in order to use the First Fire Jr.'s and E30 composite motors. E30's are not like E9's, which are black powder motors. E30's are a different and more powerful propellant that need a good ignition source.

Apogee Components, Inc. is pleased to announce the second in a yearly grant program geared toward model rocketry education organizations!

Apogee Grant Program

The rules are simple:

1. Entrants must submit an essay to Apogee. There is no length requirement for the essay.
2. Any club, organization, or school program, is eligible for entry. This would include rocketry clubs or prefectures, 4H, scouts, etc.
3. The content and purpose of the essay is as follows:
   - If we gave you $300.00, How would you use it to impact the rocketry community?
   - How many people do you think it will reach?
   - How many people will be involved in the organizing and running of the event?
   - How big of an effect will it have on the rocketry community?
4. One of the biggest things to keep in mind when composing your essay is **"How is what I am planning unique?"**

There will be only one winner of the grant, which is $300.00 toward any order with Apogee Components.

The deadline for entry is November 30, 2007.

Make sure it is post-marked by November 30th!

The grant winner will be anounced on January 1, 2008.

What a great way to start off the new year!

Send your essay to me at:
johnm@apogeerockets.com

Or send to:

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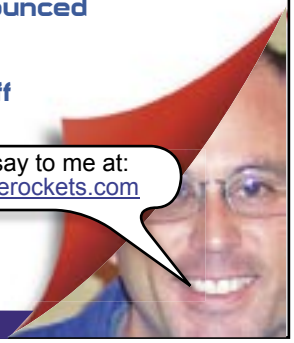
Colorado Springs CO 80907



http://www.apogeerockets.com/rocket_grant_money.asp

TIP OF THE FIN

This issue's tip is for those of you who have been into model and mid-power rocketry using single-use A-D black powder motors but would like to get into high power rocketry.

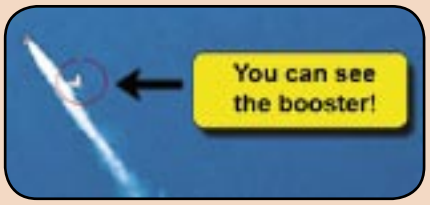
The best tip I can offer is for you to start by using single-use E, F, and G motors (http://www.apogeerockets.com/Aerotech_motors.asp) to become familiar with the difference between black powder and composite motors. Then you can move on to using reloadable motors in mid-power kits (http://www.apogeerockets.com/Aerotech_Reload_Motors.asp).

As the majority of high-power rockets use reloadable motors, you need to get used to the assembly process in smaller reloadable motors first. Once you start getting into high-power motors (H and above), the power is dramatically different from anything A-G size. Cases for reloadable E-G composite motors are available here: http://www.apogeerockets.com/Rouse-Tech_Motors.asp.

DEFINING MOMENTS

A **Booster** - In a multi-stage rocket, this is the first stage. In a parallel staged rocket, the pods containing the motors with the shortest burn time are considered the boosters.

In a complex single-stage rocket, the term sometimes refers to the part that contains the motor assembly. The Dynastar Rip Roar is a multi-stage rocket that has a booster for the first stage. Please see http://www.apogeerockets.com/Rip-Roar.asp and order this big rocket that will blaze a path into the sky over and over again!



Rocketry Achievements

Outstanding Achievements are back! Rocketeers have come out of hibernation and are building, flying, and-showing off their craft as never before! At Apogee Components, we like to give special recognition to our customers that have worked extra hard to make astounding achievements. Recently, these individuals made significant rocketry accomplishments, and we would like to recognize them:

Jeff Taylor and Darren Wright of Loki Research reported that "The Embry-Riddle Aeronautical University student built rocket “Icarus” was launched from Wallops Flight Facility at Wallops Island, Virgina shortly after 6am on 3/22/07. They said, "The flight was nominal and initial data put the maximum altitude achieved between 180,000 and 210,000 feet. An excellent skin track radar report shows the first stage booster reaching an apogee of 23,100 feet and hitting the impact zone within one sigma." Darren later reported that "Mike Stackpole informed us yesterday that NASA has released an offical altitude for the sustainer: 37.8 statute miles or 199,584ft." Both the students and the Wallops flight crew were thrilled with the results and are looking to future projects. Here is a link to some of the project photos: http://www.rocketryplanet.com/content/view/1750/28/. Congrats to all who were involved in this project! Also, congratulations go out to all of these individuals! Great work to all of you. We know it took a lot of effort, grit, and determination. For these reasons we celebrate your accomplishments! If you see a name in the above list that you know, why not send them a note of celebration?

Lloyd Chumbly	Level 1	CO
Daniel Barret	Level 2	FL
Roger Noss	Level 3	FL

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Web Sites Worth Visiting

This issue's website worth visiting dovetails on the Icarus Project listed on page 9 in the Outstanding Achievements section. It is that of the Embry-Riddle Future Space Explorers and Developers Society (ERFSEDS), which can be found at http://rocket.deck.googlepages.com. They state on their website that they are "dedicated to providing hands-on experience in space exploration and related topics for students at Embry-Riddle Aeronautical University."

When you start exploring this site, the first thing you will notice is that the members mix both fun and seriousness to their projects. If you go into the Projects page and then to the Icarus link, you will be taken to a page that will give you additional details about the project as well as a video of the launch (very cool)! On the lighter side, under Past Events, is a project they called the "2 X 4 Launch". They state, "The decision was motivated by the Vice President and Project Manager's need to get rid of wood leftover from making beds. Each participant was given a 2 x 4, which could be cut or shaped in any manner." Futhermore, the lesson learned from this event was so eloquently put: "An important first lesson in that what looks like a rocket does not necessarily fly like a rocket."

There is much other than these 2 features to view here. From the "Egg Launch" to their Kennedy Space Center Trip, there is much more to take a gander at! As teacher Doug Knight (who was featured in Newsletter 179) said in response to the Icarus launch, "That is very cool. Stuff like this is what gets students going. We have the means to get kids excited concerning science and math: rockets! And stuff like this just demonstrates it. The students will never forget this. Congratulations on the rocket and thank you for the time you gave these students. Education needs more like this."

Question & Answer

A common question we receive is, "When using RockSim on a Mac, why does the program not save any files?"

The reason is that when you are installing the program on a Mac, you can't run the program from the disk image file and save any design files. You must first drag the contents of the RockSim 8 folder into the Mac's Applications folder, which will copy everything from the desk image to the hard drive. You will then be able to save files normally. This is shown in the picture on the right.