



The COS-Rocketeer

The Official Journal of the Colorado Springs Rocket Society (COSROCS)

NAR Section #515



Volume 13, Issue 2

March/April 2002



Keith Kuhn launches his Estes Sweet Vee.
(Photo by Nadine Kinney)

Notice: COSROCS membership renewals are due in May. Please pay our treasurer, Mark James, at one of our upcoming launches or meetings. You may also send payment to the address shown on page 2.

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The COS-Rocketeer is the official journal of the Colorado Springs Rocket Society (COSROCS), NAR section #515. This journal, published bi-monthly by members of COSROCS, serves to provide information on all aspects of rocketry. Articles, rocket plans, and photos are always welcome. Items for publication should be submitted to the editor:

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Material appearing in **The COS-Rocketeer** may be reprinted by *Sport Rocketry* magazine or other NAR section newsletters, as long as proper credit is given.

COSROCS' membership dues are \$20.00 per year per family. Junior memberships (under age 18) cost \$5.00 per year. Checks should be made payable to COSROCS. Applications and payment should be mailed to the following address:

COSROCS
P.O. Box 15896
Colorado Springs, CO 80935-5896

The COSROCS phone number is (719)575-0060

If you have access to the Internet, COSROCS has a web site and a listserv. The COSROCS web site is:

<http://www.cosrocs.org>.

The e-mail address for the listserv is crosrocs@yahoogroups.com. To subscribe to the listserv, go to <http://www.yahoogroups.com> to register and select COSROCS.

COSROCS is a family-oriented club. Everyone is always welcome at our launches and meetings. Please join us. You'll have a blast!

COSROCS received the NAR's LAC Award (Rockwell Trophy) in 2000 for having produced the best newsletter.

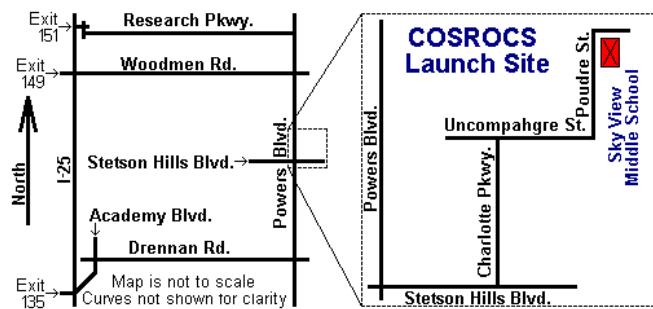
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Launches and Meetings

COSROCS holds a business meeting on the second Wednesday of every month from 7:00PM until 9:00PM. The meeting location is the Gold Hills Police Station at 705 South Nevada Ave., Colorado Springs.

COSROCS holds a sport launch on the first Saturday of each month, weather permitting. The launch is held at the Sky View Middle School, located at 6350 Window Peak Blvd. in Colorado Springs. The launches begin at 9:00AM and last until approximately 12:00 noon. Our launches are free and open to the public. A one pound weight limit is imposed for rockets launched at Sky View.



COSROCS holds a sport launch on the third Saturday of each month at Cape Preble in Peyton, Colorado. The launches begin at 9:00AM. This launch site has a 3.3 pound weight limit for rockets. To get to this launch site, head east on Hwy 24 towards Peyton. Turn left on Peyton Highway, right after the little grocery store. After the curve, bear right onto north bound Peyton Hwy. Drive to Sweet Road, 4th turn on the right. Go approx 2 1/4 miles on Sweet road. On the left, near the bottom of the hill, is a gate to the launch site (21410 Sweet Road). Look for the green ranch gate.

The Nagging Editor

By Greg Elder

New Address. I have recently moved. If you need to mail something to me for the newsletter, use my new address as listed on page 2 of this issue. By the way, my address will change again, probably around August.

Newsletter Contest Winner. Dave Nauer won the contest in the last newsletter. He was the first person to correctly answer the three questions hidden in the newsletter. Dave won a pack of Estes B6-4 motors. Below are the three questions from last issue and the answers:

- Question #1 (on page #5), True/False, Estes made a nose cone to use with their original engine mailing tubes. Answer: True. Part number 651-BNC-MTD @ \$0.30 in 1969.
- Question #2 (on page #6), who held NAR #1? Answer: Orville Carlisle.
- Question #3 (on page #11), who was the second man to walk on the moon? Answer: Buzz Aldrin.

Thoroughly read this issue to find its contest.

Thanks. Thank you to everyone that supplied material for this issue. I could not complete the newsletter without your inputs.

The President Speaks! The Spirit of Competition

By Greg Sandras, COSROCS President

With all the recent excitement/controversy over the Winter Olympics, I thought I would touch on our own contests in this hobby as compared to other sports/contests.

With the spirit of competition for the “gold” in the Olympics, \$1.5 million for the winner of the Daytona 500, or a \$25,000 Super bowl ring, our contests seem a little trivial. However, in the big “contests” you do whatever it takes to win. It doesn’t matter if you cause 17 other cars to wreck in a race. It doesn’t matter if you do your best to give a quarterback a concussion. It doesn’t matter if a judge helps you to win. Winning is everything. People’s lives, careers, money, or spirit is of no (or little) concern to most of them. Is this competition? Certainly not sportsmanship. At least not how I’ve been raised. But these are “family” events. Where is the fun, the thrill of victory if it is bitter-sweet? Which brings me to the high pressure of model rocketry contests.

Model rocketry is a little more down to Earth. Pun intended. Most people I found in this hobby have put sportsmanship, and their fellow competitors near the top of the list. Money or title is farther down the list. The competition is truly a “family” event. All competitors are willing to help each other in anyway possible without giving away too many secrets or cheating. I won’t say we don’t have our one or two in our hobby like other sports, but everyone ends up having a good time. There is almost always no bitter-sweet victory unless your rocket is the only one that qualified!

I hope rocketry does not change in this fact, and other “sports” learn from our example. But somehow, I doubt the big sports won’t.

Section News

Looking for a new launch site (again). Houses seem to be going up very fast near Sky View Middle School. Some think we will only be able to launch there for 6 more months. Thus, we are on the lookout for another launch site that is close to town for launching

model rockets. Contact Greg Sandras if you know of any good locations.

Razor Rally. Last year, Neil Kinney suggested our Razor Rally contest. However, it seemed that every time we scheduled the event, the weather did not cooperate. We plan to try this contest again, at our April launch (no fooling). What is the Razor Rally? Simple. First, purchase a Custom Rockets Razor kit. (Hobby Lobby has them.) Do **not** open the kit. Bring the unopened kit to the contest in April. The contest rules are as follow. First, everyone must build the rocket on site starting at the same time. Next, everyone must fly and recover their Razor three times—using two B motors and one C motor. Finally, after your flights are completed, turn in your rocket for judging. You receive points based upon when you finish building the kit, when you complete your three flights, and the appearance of your rocket as compared to the picture on the package. This unusual contest should be lots of fun. We hope to see lots of people with Razors at the April launch.

Winterfest XI

By David J Nauer

For only the second time in club history, someone other than David Nauer headed COSROCS’ Winterfest contest. Contest Director Greg Elder performed all of the duties, ranging from the initial application, through actual conducting of the contest, through results compilation. I think he put on a GREAT contest and did a fine job learning some of the “secrets” of conducting a NAR contest. He found it isn’t that hard, and a little organization from the start goes a long way to a successful contest.

This years Winterfest was delayed a month due to expected bad weather in January. Unfortunately, we decided to delay the event in January due to extremely bad weather the night before the contest – when we woke up the following morning the weather was crystal clear and the wind was calm. It was still cold out, but would have been one of the nicer days in quite a few years for a Winterfest.

We decided to do February unless the weather was terrible. Unlike January, the skies were mostly overcast and there was a steady north wind. We decided to hold the launch anyway, and had 12 competitors give it a shot. The day was not pleasant, but it was flyable, and most competitors flew the events they intended to try. Interestingly, all of these events have been flown at COSROCS events in the past, and none of the flights at Winterfest XI qualified for any new COSROCS records. This is perhaps the first Winterfest ever where new COSROCS records were not set, although many past Winterfest contests have featured new, never before flown engine/event combinations.

Of special note is an oddity surrounding NAR contests. Each NAR section, like each NAR competitor, can only count 12 contest factors each launch year. Generally, regionals give the best chance for a club to accumulate points, and CRASH voted to skip Winterfest this year as a section. Rather, the club decided to fly in UROC’s regional later in the year. Thus, any CRASH competitors flying in our contest flew as independents so that CRASH didn’t get forced to use our Open contest towards their section “official” contest weighting factors. As such, the normal CRASH contingent flew under no banner, but (as usual) did very well, winning 3 of the top 4 places in the overall results. Also, CRASH members won all of the blue ribbons in this contest, dominating COSROCS’ membership once again. But there is no glory for the independent as the club championship for each launch only counts folks flying for their section at that contest, so despite this domination, COSROCS reigned as the section champion for Winterfest XI.

There were no A, B, or T entries at this contest, so all competitors flew against one another in the C Division. Since all CRASH entries were flown as independent, only COSROCS and SCORE (our state's newest NAR section in Pueblo) accounted for club competitors.

Open Spot Landing

This event can be challenging and the spot was about 100m to the south of the launch rack. The winds were coming out of the North, so strategies ranged from very low flights launched towards the spot, to highflying rockets tipped to the North. Former National Champion Bruce Markielewski proved this event was more than simple luck, flying in the first contest rack of the day and winning this event. David Nauer's flying saucer took a close second. Long-time CRASH competitor Mel Gray grabbed third place only 3m farther away than David Nauer, and Greg Elder finished in the ribbons with a 17m flight.

Name	Distance	Place	Points
Bruce Markielewski	7	1	80
Dave Nauer	11	2	48
Mel Gray	14	3	32
Greg Elder	17	4	16
Tom Dembowski	19	5	8
George Shaiffer	25	6	8
Bob Ellis	39	7	8
Jason Unwin	DQ	X	0
Dawn Holland	DQ	X	0
David Tjarks	DQ	X	0

1/4A Streamer Duration

You would think streamer duration would present the easiest challenge to the adult competitor, but this year's contest witnessed 10 of the 18 flights being disqualified. This was an unusual contest year because the only legal 1/4A engine for this contest was the Estes 1/4A3-3T, an engine with a 13mm casing.

Despite the low power motors, separations seemed the rule of the day, as most disqualified flights either separated or didn't eject safely. Bob Ellis proved his consistency and his skills, including a terrific 65-second flight to grab first place. He was the only competitor to achieve two qualified flights. Mel Gray, despite a second flight DQ, grabbed second, followed closely by David Nauer and Bruce Markielewski.

Name	Flt #1	Flt #2	Total	Place	Points
Bob Ellis	20	65	85	1	160
Mel Gray	29	DQ	29	2	96
Dave Nauer	DQ	23	23	3	64
Bruce Markielewski	DQ	20	20	4	32
Jon Hodge	DQ	11	11	5	16
Dawn Holland	11	DQ	11	5	16
David Tjarks	DQ	7	7	7	16
Tom Dembowski	DQ	DQ	DQ	X	0
Greg Sandras	DQ	NF	DQ	X	0
George Shaiffer	DQ	NF	DQ	X	0

1/4A Boost Glider

This was a challenging event due to the low power, windy conditions, and cold air. Bob Ellis had the most unique design when he uncovered his sub-scale "Deltie" boost gliders. They were made exactly as other Deltie kits, but were scaled down and worked very well with 1/4A3 motors. However, Mel Gray took the day with a great 59-second flight. Bruce Markielewski was the only other competitor to fly two successful flights, coming in a third place. David Nauer and David Tjarks tied for 4th with single low duration flights.

Name	Flt #1	Flt #2	Total	Place	Points
Mel Gray	59	17	76	1	360
Bob Ellis	30	36	66	2	216
Bruce Markielewski	24	30	54	3	144
Dave Nauer	7	NF	7	4	72
David Tjarks	7	NF	7	4	72
George Shaiffer	DQ	5	5	5	36

B Eggloft Duration

This event mixes low power in a different sense, featuring the smallest engine that can still safely loft an egg. The mix of lightweight design with a solid structure, and opening a reasonable parachute made this event especially challenging on this cold day. Only four flights were successful out of 14 attempts, and those four flights represent the placements in this event. Bob Ellis had a wonderful chute opening and a great flight to easily capture the event ahead of Mel Gray's respectable 46-second time. Greg Sandras and David Nauer rounded the successful flights for the day.

Name	Flt #1	Flt #2	Final	Place	Points
Bob Ellis	62	NF	62	1	340
Mel Gray	46	NF	46	2	204
Greg Sandras	DQ	21	21	3	136
Dave Nauer	5	NF	5	4	68
Bruce Markielewski	DQ	DQ	DQ	X	0
David Tjarks	DQ	NF	DQ	X	0
George Shaiffer	DQ	DQ	DQ	X	0
Tom Dembowski	DQ	DQ	DQ	X	0
Jason Unwin	DQ	NF	DQ	X	0
Dawn Holland	DQ	NF	DQ	X	0

1/4A Super Roc Duration

It was odd to see these rockets referred to as "super rocs" because the maximum length credited in this 1/4A-powered event was 50cm. That isn't much more than 1.5 feet, and many 1/4A Streamer Rockets would easily have qualified for the shorter limit of this even (25cm)!

Bruce Markielewski maintained his dominance in COSROCS Super Roc contests, once again grabbing the blue ribbon with two flights totaling 2,600 points. His second flight alone was worth 2,050 points, almost bettering the two-flight total of David Tjarks, who took second place. Jon Hodge grabbed third, and Bob Ellis finished fourth.

Super Roc duration competition multiplies the length of the rocket times the duration of the flight for a total number of points

accumulated. The results of two flights are added together for the total points.

Name	Flt #1 Pts	Flt #2 Pts	Total	Place	Points
Bruce Markielewski	550	2050	2600	1	260
David Tjarks	980	1078	2058	2	156
Jon Hodge	650	700	1350	3	104
Bob Ellis	1150	NF	1150	4	52
Mel Gray	DQ	1080	1080	5	26
Dave Nauer	DQ	DQ	DQ	X	0
George Shaaffer	DQ	NF	DQ	X	0

Final Contest/NAR Points

CRASH had three members take the top three places, earning 2,010 NAR points. It will be interesting to see if CRASH earns more points than that in the regional they plan to attend, but I suspect with A, B, and team competitors they easily will do so. None-the-less, these competitors flew as independents, but ruled the day!

Bob Ellis proved planning, preparation, and a little engineering can win a contest even on cold and windy days. His consistency netted him two blue ribbons and qualifying flights in every event. It also netted him the Winterfest XI Contest Champion award—nice going Bob!

Mel Gray was the only other competitor to qualify in all contest events, and despite finishing first in only one of the events, he came very close to Bob Ellis' total. Bruce Markielewski once again placed in the top four, grabbing third overall. And COSROCS competitor David Nauer finished in fourth.

It was nice to see new faces, and competitors such as David Tjarks (5th) and Greg Sandras (6th) had fine showings with nice flights. It was fun to see a winter contest with 12 competitors, and it was great to see a new section (SCORE) enter the world of NAR Model Rocket Competition.

The bittersweet side of this contest was the fact that CRASH once again dominated the results, but flew as independents. Thus, COSROCS picked up the section championship for this Winterfest, but only did so at the whim of their big brother to the north. It would be nice to someday see COSROCS go head to head with CRASH and come up with a win over each of their fine competitors. Until then...

My congratulations to all of the competitors on a nice job and we hope to see you all fly in the next regional contest—CARCIS X in Denver in mid-March. See you there!

Final Contest/NAR Points

Name	Place	Contest Points	NAR Points
Bob Ellis	1	776	776
Mel Gray	2	718	718
Bruce Markielewski	3	516	516
Dave Nauer	4	252	252
David Tjarks	5	244	244
Greg Sandras	6	136	136
Jon Hodge	7	120	120
George Shaaffer	8	44	44
Greg Elder	9	16	16

Dawn Holland	9	16	N/A
Tom Dembowski	11	8	N/A
Jason Unwin	12	0	0

Section Results

Section	Contest Points	NAR Points
Independents	2254	2254
COSROCS	592	568
SCORE	0	0

Winterfest XI—A Competitor's Perspective

By George Shaaffer

As one of the newest NAR members in the club I was looking forward to Winterfest in January. The approach of the date had me scrambling to get rockets built for each event.

What a sigh of relief, when it was postponed. Reprieve and time to work on more rockets and recovery devices. This was not my first contest only my first as a NAR member. My biggest objective was to provide the club with another NAR flier to "qualify the meet" so to speak. I was fairly sure the only way I would get any high ranks was if luck was in my favor and not for the other flyers. Luck stayed home for the most part. The learning aspect of this was that it takes really light construction for the engine size used and most of my rockets barely cleared the rod. Lots of style points for closest to the pad though and not much walking required.

I thought I might get lucky with the egg loft as the descent went to the top of the school. Pea gravel like they use on the roof system could "cushion" the landing. Not to be—I don't know when they started landscaping roofs but that roof has the largest river rock I have ever seen! That, plus a cast iron flight left me with cracked but not scrambled eggs. I probably would not have even attempted this event if I had not found the Quest egg lofter when I was in Longs looking for new engines. Overall, it was a fun experience and I was a little surprised at the end results. I don't know if I'll make it or not, but it is back to the pink book and see if I can do better at the CRASH competition.

Winterfest XI Sport Launch

By Greg Sandras

Even though it was windy and cold, that didn't stop a few people from launching a few sport launches during Winterfest XI. The wind chill must have been in the single digits. I had the first launch of the day to test the wind. I launched an Estes Seahawk on a D12-5 and immediately watched it sail down wind after the chute opened. We all agreed it was windy!

Jesse Faloon (?) was next to launch. He had a total of 3 launches for the day. All three were from an Alpha III. Two launches used B6-4s and one on an A8-3. Ian and Katie Novak also launched Alpha IIIs. They used A8-3s. One Alpha III did not have a chute fully open at apogee. This turned out to be a blessing because of the wind. It landed 20 yards away from the pad! Alpha IIIs are getting real popular with the younger crowd.

C6-7s are the perfect motor for the Estes Astrocam...unless there is a 15 mph wind, as Dave Sannerud found out. Dave's Astrocam did a large weathercock into the wind and basically did a

perfect arch right into the ground 150 yards upwind. The rocket didn't survive.

Jeff Proffit used the smallest motor of the day for the sport launch. He used a 1/2A3-4T in a Meanie. Desine Scott (a.k.a. "Mouse") used a B6-4 in a Mach 12. I don't quite remember, but I think the wind carried the Mack 12 over the school, landing about 75 yards south of the school. C6-5s were used in Joseph Acker's Razor, Shawna Lannigan's Bandit, and Dave Sannerud's Serval. The last launch of the day was Dave's Fat Boy also on a C6-5.

The day ended early due to the wind, the cold, and frozen faces. Such is Colorado.

AeroTech Announces Motor Production List

AeroTech is pleased to announce that, due to hard work on the part of it's staff and assistance from the town of Cedar City Utah, manufacturing arrangements are coming together that will make a wide range of motors available for the 2002 flying season.

Although not all motors will be made immediately, the following 47 were chosen for our first manufacturing run based on production efficiency and market demands. More will be released as production at our new facility in Utah builds to expected capability.

Hobby Motors

- 24mm: F21W Econojet 2 Paks
- 29mm: F20W and G35 Econojet 2 Paks
- 29mm: F50T and G80T Single Use
- 29mm: F52T, F40W and G64W RMS

Note 1: Copperhead and First Fire Igniters will be available as soon as Hobby Motor production resumes.

Easy Access (by case size)

29mm

- 29/180: H128W, H238T and H165R
- 29/240: H180W, H210R
- 29/360: I200W and H268R

38mm

- 38/240: H123W, H242T and H148R
- 38/360: I161W, I357T and I218R
- 38/480: I211W, I300T and I285R
- 38/600: I284W and I435T
- 38/720: J350W and J420R
- 38/1080: J570W

Restricted Access (by case size)

54mm*

- 54/852: J275W and J315R
- 54/1280: J415W and J540R
- 54/1706: K185W, K550W, K1100T and K695R
- 54/2560: K700W
- 54mm initial production will be in Redline. The remainder of the 54 mm reload kits will be released in the RMS-Plus™ configuration as they are certified (April/May). All 54mm reload kits will be released in long RDK-Plus™ delays.

Note 2: Delays for 29mm, 38mm and 54mm will now be sold in packs of three RMS-Plus™ delays each.

75mm

- 75/2560: K560W
- 75/3840: L850W

- 75/5120: L1120W
- 75/6400: M1315W

98mm

- 98/7680: M1419W, M2400T and M1600R
- 98/10240: M1939W and M200

Shipment of Hobby motors is estimated to begin in March, Easy Access motors in March/April and Restricted Access motors in late April/early May.

AeroTech dealers have been supplied with this initial production information and are prepared to begin taking orders for any of the listed motors. Dealers will also take requests for those motors not included on the initial list. AeroTech will then evaluate those requests and, should the quantities justify, restart additional product lines.

At this time no final schedule has been set for the reintroduction of the remaining AeroTech rocket motors. As production rises to pre-fire levels AeroTech will work closely with its customers and dealers in making these decisions.

Any questions about this press release may be directed to Mike Martens at mmartens@aerotech-rocketry.com.

Estes Launch Lugs at a Cost of \$ 10,000 per Pound (Well, Almost)

By Frank Bittinger

Most rocketeers know that the cost of doing business to put satellites into orbit is about \$ 10,000 per pound.

Well I recently bought an Estes variety assortment of Launch Lugs at a cost of \$ 4.69 (That's \$ 5.08 with tax) for 14 assorted launch lugs. I weighed these 14 lugs at Monument Pharmacy at 2.6923 grams total. Assuming 453.8 grams per pound, this works out to \$790.50 per pound for Estes flight certified Launch Lugs. Do we need to forward this tidbit to Mary Roberts ??

Why Rockets Are Better Than Dogs

By Dan Schneider

Here is my top-10 list of why Rockets are better than Dogs.

- 10) Rockets don't pee on the carpet.
- 9) A rocket is less likely to run away (unless it's a Machbuster or Mosquito or if you connect your main chute to the drogue chute ejection charge connector).
- 8) A rocket won't get worms (unless you forget the ejection charge and it augers in).
- 7) I have yet to meet a dog that smells like AP or BP.
- 6) I have yet to have to rub my rockets nose in its droppings.
- 5) With a straight face, can you seriously name a dog something like "Project Xeon" and NOT get laughed at?
- 4) Rockets don't take up couch space.
- 3) Most rockets don't look at you funny when you count from 5 to zero and stare at them. (Unless you're still using copperheads)

- 2) It's cooler to get a visit from the BATF than the ASPCA.
- 1) Have you ever tried to chad stage a dog? It's not as easy as it sounds.

Turning Wood Parts

By Warren Layfield

Only rarely do commercial nose cones and adapters come in exactly the right size and shape for an accurate scale model. This need not be a roadblock, as you may already have the tools you need for turning balsa wood parts even if you don't have a lathe. If you are serious about scale modeling, turning your own balsa cones is a must.

There are few steps in the construction of a model that are more satisfying than turning your own nose cones and adapters. Fortunately, you can adapt a range of equipment for this purpose. A wood lathe is ideal, of course, but a drill press, a hobby lathe, or even a simple power drill will do the trick. Safety glasses are essential, and depending on your setup, you may need a dust mask. You will also need your brain. You may be using a tool for purposes it was not intended for. Neither this book nor the drill manual will cover all aspects of safety. So you will have to think about safety for your own setup. Think carefully about what may come in contact with the turning wood and machinery: tools, your hand, your clothes, your hair, etc. Think carefully about where things will go flying when something gets caught or flies apart.

If you are working with anything harder than balsa, look into taking a woodworking course at a local community college or public school/adult education program. Many of these courses are unstructured and allow you to work on your own projects. If you own a wood lathe, follow the operator's manual. If you are working with a drill or drill press, here are a few tricks.

First, you need a sturdy and rigid connection between a balsa block and your drill. Begin by drilling a hole in one end of a block of balsa. This hole should be the size of the largest dowel you can fit in the drill chuck. The hole should be as deep as possible without running into the future surface of the nose cone. Next glue a dowel into the hole. The dowel should go all the way to the bottom of the hole. Cut the dowel to a length such that when you insert it into the drill chuck as far as it will go, there will be a 1/4" to 1/2" gap between the chuck and the wood block. Allow the glue to dry thoroughly (overnight) before proceeding.

If you don't have a drill press, clamp the power drill rigidly to your work bench. A solid, sturdy attachment is critical. Set your drill for its slowest speed. Insert the dowel protruding from the wood block into the drill chuck and tighten. Give the balsa block a few turns by hand. If it isn't turning about its center, trim the block to balance. Give the drill motor a pulse of power for an instant while holding a pen or pencil to the end of the block. This will leave a circle showing you the axis of the block. Use this mark to guide balance trimming. Every drill has its limits. If your wood block will not turn smoothly no matter how well balanced it is, it may simply be too big for your drill. You may be able to replace the part with a paper shroud, or a combination of turned parts, body tube, and paper shroud. Or you may have to abandon the project. Obviously you should not save wood turning for last if you haven't made a similar part before.

There are two important principles to follow while turning a balsa part. The first is to go slow. The second is to hold cutting tools rigidly. Both are necessary for good results and for safety. "Going slow" refers to the rate you advance the tool cutting into the wood. If you try to cut too far too fast, the cutting tool can catch on the wood. The results can be a chunk of wood being ripped from the part; the

dowel changing its orientation in the drill bit, introducing a wobble; damage to the drill bearings; or the tool being thrown at you or at a finished area of the part. Take it slow. Move the tool along the length of a part at about one centimeter per second. On each pass, cut no more than a millimeter into the wood.

Hold the cutting tool tightly. Hold the tool rigidly to a fixed position. It is easy to fall into the trap of applying a constant pressure instead. If you do, your tool will start to work faster on the softer portions of the wood and more slowly on the harder portions. The result is a lopsided cone. It is easier to hold the tool fixed if you can rest it against something rigid. Use the work support on a drill press or a piece of wood clamped to your workbench if you are using a power drill. A solid grip is also necessary for safety. Should the tool catch on the balsa part, you will want a good grip on it so it won't go flying.

Proper lathes use thick, chisel-like tools to cut into the wood. Fortunately, balsa is softer than most wood, so we can get away with more primitive tools. I have found that the saw blade on a Swiss Army knife is quite useful in the early steps of balsa turning, first rounding up the block, and then getting the wood down to within 1/8" of its ultimate size. Next, use small files, including jeweler's files, to get to within a millimeter. I use very fine finishing sandpaper, down to #400 grit for the final surface.

There are a few tricks to measuring sizes as you work down the wood. The first is to use a ring of the body tube you are trying to fit the balsa part to. Slit the ring so you can fit it over the front of the nose cone. Use this ring to check the fit of the shoulder of the balsa part. If the ring doesn't quite close around the shoulder, then note the size of the gap. You will need to trim the radius by about 1/6 of this distance. Once the shoulders are turned, work on the exposed surfaces.

Vernier calipers are very useful for measuring progress. Use a catalog to determine the shoulder diameters, and your scale calculations for other diameters. An alternative improvised "caliper" can be made from cardboard. Cut out a C-shaped incomplete ring whose inside dimension corresponds to the desired dimension. A cardboard side-view template can also be useful. Once the part is cut to shape and fine-sanded, it is easier to seal the balsa grain while the part is on the drill chuck. Do not remove the part before you are completely finished, as you will lose the exact alignment no matter how carefully you reattach the dowel to the chuck. Apply sanding sealer or glue to the part, allow to dry, and then sand with very fine finishing sandpaper. Repeat until the part is perfectly smooth.

Wood-turning is also useful for many detail parts. Often you can turn down a simple bit of dowel mounted in a drill chuck. This is a handy way of making escape rockets, small nozzles, and other bits and pieces.

Team America High School Rocketry Challenge

The National Association of Rocketry (NAR) and the Aerospace Industries Association (AIA) are sponsoring a rocketry design challenge for U.S. high school student teams as part of the Centennial of Manned Flight celebration in 2003. The "Team America Rocketry Challenge" involves designing, building, and flying a multi-stage model rocket (less than 3.3 pounds liftoff weight, 125 grams propellant in NAR certified model rocket motors) that takes two raw eggs and an electronic altimeter as close as possible to exactly 1500 feet. Of course, the rocket must fly safely and the eggs must return undamaged!

Winners will be selected at a flyoff competition, to be held in Northern Virginia in April 2003. The top 5 student teams will receive shares of a total prize pool of approximately \$50,000 in

savings bonds, and the total prize pool for the winners' sponsoring schools is approximately \$9,000 in cash.

For more information, visit the NAR website or the AIA website www.aia-aerospace.org. Entry applications will be posted on the AIA website by April 2002; all teams must go there to enter. Entry fee of \$160 will include an Adept A1 electronic altimeter, a copy of the Apogee RockSim 5.0 computer design and flight simulation program, and a copy of G. Harry Stine's Handbook of Model Rocketry. Special NAR membership packages and launch site owner insurance support will be made available to teams that enter.

Event manager for the NAR is Trip Barber, NAR Vice President, at ahbarber@alum.mit.edu.

This Old Rocket, Part 3

By Tom Dembowski

Well, our nagging editor is after me again for another installment of This Old Rocket, so here goes...

We are rapidly running out of 60s and 70s kits to talk about so I may have to expand this series to included later kits in future installments. Some kits I decided not to discuss are popular kits that still sell well today (although in slightly different form). Of course I'm talking about kits like the Alpha and Big Bertha, still popular for many beginners. The kits are slightly different today, using plastic cones and such where the originals used all balsa. The balsa cones can still be purchased even today so it is possible to retrofit a new kit with balsa if you so desire.

Another kit called the X-Ray is a good example of a kit somewhat like the original but very much changed (in this case downsized). It now uses mini-engines where the original was a BT-20 core tapered up to a clear plastic BT-50 sized payload bay. This was a very popular kit in its time being fairly inexpensive and easy to build.

As I mentioned in the last two articles, scale models were very big back then. The ultimate scale kits were of course, the Saturn 1B and the mighty Saturn V. Well, the Saturn V looked mighty but in actuality it was not such a great kit to fly, at least in its original configuration. The very original used 3 "C" engines in a cluster. It just seemed to need more boost. I have no hard statistics but almost every launch of the rocket with the original "C" engine configuration I've witnessed seem to crash. The later modification using a "D" engine was somewhat better but it still seem a bit under-powered. (One important exception to this was the special 'D' engine used to launch a Saturn V at the 1969/70 Bluebonnet Bowl game on New Years Eve in the Astrodome. On national TV, it was important to keep the rocket from hitting the rafters). Trivia question: what other model rockets were launched that night prior to the Saturn V flight and what was the engine? An "E" engine with at least a 12 or 15 impulse seems to be the best bet if you actually want to go out and fly your kit. This kit has been reissued several times in the past and will likely be continually released in the future. Since we're on the subject of the Saturn V, one very desirable kit is the much smaller "semi-scale" version of the kit. This was available for many years as an easier and more practical version of the vehicle. It was about 18" in length, used standard A/B/C engines and obviously, much less expensive than its larger cousin.

The Saturn V wasn't the only model to have different size variants available. When Estes debuted its new (at the time) mini-engines (the T series), it also made smaller size versions of its popular models. There was a mini-Bomarc kit in addition to a standard size kit and the same with the Big Bertha. It is interesting to note there were three versions of the Bomarc available at different

times. The most recent of course, was the North Coast high-powered kit sold a few years ago.

When the 'T' engines made their debut, they deleted the old 'S' engines from the catalog. The 'S' engines were the same diameter as the standard ones but an inch shorter. As you would expect, the impulses ranged from 1/4A to A. Some of the kits which previously used these short engines included Birdie (yes its what you think, a badminton birdie that flies), the Midget and Beta (the latter could be flown single or two staged). While the Birdie and Beta merely used smaller engine mount tubes, they actually scaled down the Midget from BT-50/BT-20 sized tubes on the original to BT-20/BT-5 tubes for the mini-engines. Of course the originals can be easily modified if you are lucky enough to track down an original kit (and then you may not want to open it if it's still sealed since it's worth much more that way). The parts to build a reproduction can easily be found.

Another kit that's been reissued at least three times by my count is the Mercury Redstone. I believe all three have been different scales. The original kit used a BT-60 and as you would expect, is a very difficult kit to build. The cone was balsa with a paper wrap simulating the capsule. The tower of course was built using tiny wooden dowels and pieces. The fins also had to be assembled from balsa parts. The 80s variant was much easier, using a plastic kit for the capsule assembly as does the current "Liberty Bell" issue. Although I'm sure they're out there, I have yet to see an original Mercury Redstone at one of our launches. Maybe I'll piece one together from the original parts I still have and try it out.

The mid-70s seem to be a turning point in the hobby. After the immense popularity of model rocketry in the late 60s and early 70s, things seem to wind down as baby-boomers went off to college and the work force. I know many people who didn't touch a model rocket for over a decade before getting interested again. Some kept their old kits, for others they went out to the garage sale or trash with the old baseball cards and phonograph records. When people did renew their interest in rockets, much had changed over the years. Obviously, the increased use of plastic parts was one. I remember picking up a Big Bertha in 1980 to launch at a unit picnic and surprised to find the nose cone was plastic. Many kits were made with die-cut balsa fins if they used balsa at all. Also, high-powered engines began to change the hobby, many long time enthusiasts got interested in bigger and more powerful kits. And launch contests grew in popularity. Where once upon a time a rocket to loft an egg was called the Scrambler and huge in size, now we have specialized kits to get the most performance out of a launch for either altitude or duration. By the mid-80s many of the original kits had been retired and whole new generation had taken their place.

Next time we'll discuss some of these "newer" kits (already 15-20 years old, and many have been out of production for over a decade) and compare them to some originals. Until then, keep em flying...

Neubauer Rockets Releases 4" Gemini-Titan Kit!

Neubauer Rockets has just released a giant 1:30 semi-scale version of the classic Gemini-Titan rocket! This is the 12th. kit in the Neubauer line of scale kits celebrating America's early space program. Standing almost four feet tall, this Skill Level 3 kit features a resin cast capsule measuring approximately 8 inches in height and accurately detailed with louvered surface features, two windows, and approach radar. Priced at \$149.95 and designed to fly on the 29mm G80-4T motor, this 4" diameter Gemini slowly lifts off the pad and flies to 350 feet using the unobtrusive detachable fin unit with

plywood fins. For static display, the kit includes resin cast engine bells. Vinyl decals (lettering and roll patterns), plywood centering rings, Gorilla style shock cord mount and single 50" nylon parachute round out the package. Detailed instructions are also included. Neubauer Rockets may be ordered online from Discount Rocketry (www.discountrocketry.com) or Neubauer Rockets (www.neubauerrockets.com), both sites offer secure ordering. Phone orders may be placed by calling Discount Rocketry directly at 760-432-9626 between 10am and 6pm M-F (Pacific Time).

Neubauer 1:30 Gemini Titan Kit

Length: 46"

Diameter: 3.9"

Recommended motors: G80-4T

List Price: \$149.95

Micro Maxx Flying Saucer

Art Applewhite has kindly allowed me to reprint his plans in our newsletter. Please adhere to these guidelines:

1. Individuals may make as many as they want, as long as they don't sell them or use them for other commercial purposes.
2. Mr. Applewhite retains all rights to the design.
3. Although the design has been tested and is stable and safe, he is not liable for any injuries or damages from use of this design.

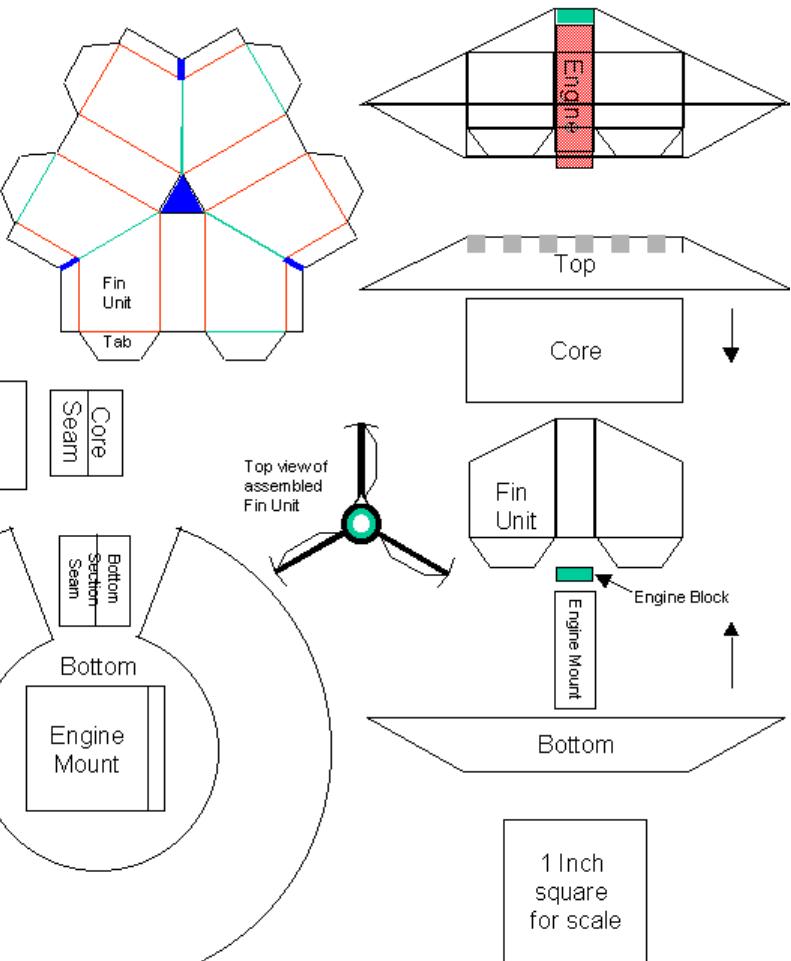
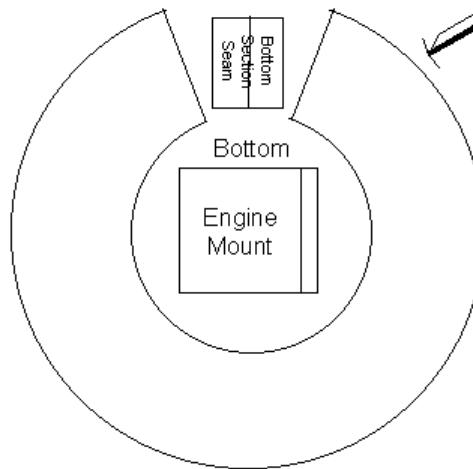
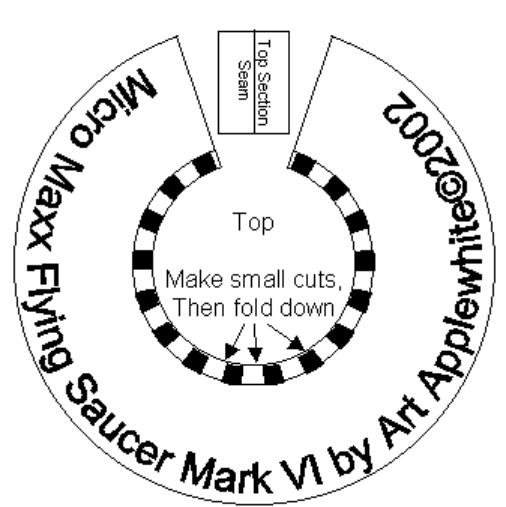
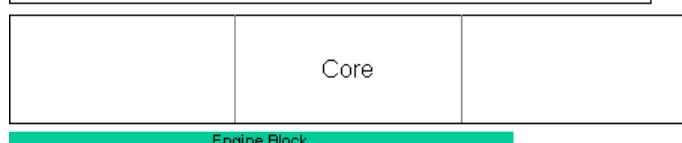
He would appreciate any comments and will answer questions about his design. Contact him via email at vanapple@aol.com.

He plans to offer fancier versions of this basic design, for sale at a reasonable cost (3 for \$1+postage). He is also developing larger versions using 13mm and 18mm engines and maybe a "D" version if there is any interest.

<http://www.geocities.com/vanapple>

Micro Maxx Flying Saucer by Art Applewhite

1. Print on letter sized, 110 lb. card stock and cut out parts.
 2. Make the Top, Bottom and Core with flat seams gluing seam pieces on the back with white glue.
 3. Glue Top to Core with "fingers" on the outside of the Core.
 4. Using an engine as a form, roll and glue Engine Mount then roll Engine Block and glue inside the Engine Mount.
 5. Cut the blue areas from Fin Unit then fold on colored lines, red lines fold in, green lines fold out.
 6. Glue the fins together and insert Engine Mount even with the top of the Fin Unit.
 7. While the glue is still wet, run a stiff wire back and forth between one leg of Fin Unit and Engine Mount to form a channel for the launch rod.
 7. Push Bottom around Core until it touches Top all around, then run a narrow fillet of glue into the Top-Bottom and Bottom-Core seams.
 8. Slide Fin unit into Core and glue.
 9. Bend the tabs on Fin Unit clockwise in the Southern hemisphere (-), as seen from above, to make the flying saucer spin in flight.
- Send questions or comments to vanapple@aol.com



COSROCS Calendar

Unless otherwise noted, all business meetings are at the Gold Hill Police Station. Stay tuned to the COSROCS web site and listserv for changes in meeting locations.

- | | |
|------------|-----------------------------|
| 2 Mar: | Sport Launch, Sky View, 9AM |
| 13 Mar: | Business Meeting, 7PM |
| 16 Mar: | Sport Launch, Peyton, 9AM |
| 16-17 Mar: | CARCIS X, Denver, 10AM |
| 6 Apr: | Sport Launch, Sky View, 9AM |
| 10 Apr: | Business Meeting, 7PM |
| 20 Apr: | Sport Launch, Peyton, 9AM |
| 4 May: | Sport Launch, Sky View, 9AM |
| 8 May: | Business Meeting, 7PM |
| 18 May: | Sport Launch, Peyton, 9AM |

Model Rocket Days in Pueblo

The Pueblo Weisbrod Aircraft Museum and the Southern Colorado Rocketeers (SCORE) chapter of the National Association of Rocketry (NAR) are sponsoring Model Rocket Days in Pueblo. The location is the Pueblo Memorial Airport, located 6 miles east of Pueblo on Highway 50 East/Colorado 96 East.

The building of model rockets will start at 9AM in the hangar of the Pueblo Weisbrod Aircraft Museum on launch day. Rocket launching starts at 10AM. Signs will be posted to the launch site. The following dates are scheduled for Model Rocket days:

- 16 March 2002
- 20 April 2002
- 18 May 2002
- 15 June 2002
- 20 July 2002
- 17 August 2002
- 21 September 2002
- 19 October 2002

The cost to participate is \$5.00, to cover the cost of the rockets and motors. For more information, call the museum at (719)948-9219 or email at jbu@ris.net. Parent or guardian must be present for child to participate.

The Strategic Air and Space Museum Tour

By Frank Bittinger

On our recent trip driving between Chicago and Colorado Springs we were fortunate to be able to stop at the Strategic Air and Space Museum near Omaha, Nebraska. The museum has two large hangers full of Aircraft and Space Stuff from the Strategic Air Command's early days. Hanging over the lobby is a full size SR-71 Blackbird that you can just touch if you lean WAY over the railing.

In the first hanger are aircraft including:

- A C-119 Flying BoxCar of the type used for aerial recovery of the "Discoverer" spacecraft (read as Corona spy satellites) beginning in the 1960's.

- An FB-111 Aardvark and separate crewmember ejection pod
- Several Helicopters
- A B-29 with this week's display of sports cars parked under the wings.
- The British Vulcan Bomber
- And an F-102 and Mig-21.

Dominating the Hanger is a KC-97 Refueling Bird (Special note from your events leader: Rumor has it that a KC-97 Cockpit restaurant is coming soon to Colorado Springs. A COSROCS restaurant visit is planned.)

Space Hardware includes:

- An Apollo Command Module Boiler Plate mockup.
- A Snark Cruise missile boost glider, America's first intercontinental missile.
- A VELA-Hotel Spacecraft from the 1960's
- A Titan 2 Re-Entry Vehicle
- And a liquid propellant stage marked "Propulsion System-Rocket Engine" about 4 feet in diameter.

Over in the second hanger we have:

- B-58 Hustler
- B-47
- B-52
- C-47
- B-57
- B-36
- B-17
- F-101 Voodoo
- B-26
- B-25
- And the RB-45

Several Aircraft related exhibits were present in this hanger.

- Linebacker II North Vietnam Bombing raid display
- Vietnam memorial exhibit.
- The Martin Bomber plant exhibit.

Back in the lower lobby is a walk-in B-52 Cockpit Trainer with Pilot and Co-pilot stations.

- A gift shop with lots of shirts, model airplanes and aerospace videos is on the main lobby level.
- A Robotics display developed by Carnegie Mellon University is on display from January to April 2002 to educate guests on the applications and limits of robotics today. This includes 21 hands-on robotics exhibits.

For Museum information call 402-827-3100 or visit www.strategicairandspace.com The Strategic Air and Space Museum is a must see for any rocketeer.

BSD Releases Three Inch Horizon and Diablo

BSD High Power Rocketry is pleased to announce the newest additions to its line of high power rockets—the 3" Horizon and 3" Diablo! Both kits will be available Spring 2002. Inexpensive and easy to build, both kits include 29mm motor tubes, 30" nylon parachutes, full graphics, and as with all BSD kits, rail buttons. They both fly great on single-use F-G motors, and reloadable F-H motors! Pre-order are being accepted at this time by BSD.

Also in the works for 2002 is a new line of 5.5" kits, including an up-scaled Diablo, and a L3-ready 5.5" Horizon!

Details may be found at the BSD website:

<http://www.bsdrocketry.com>

NAR Board Funds 2002 Scholarships, Cannon Awards

At their winter board meeting in Baltimore, MD, the National Association of Rocketry Board of Trustees extended the NAR Scholarship Program and Cannon Educational Awards. For the academic year 2002-2003, \$5,000 has been allocated for the programs.

The Scholarship Program awards NAR members between the ages of 17 and 22 who are making plans for their college education. Scholarship amounts are variable.

The Cannon Educational Award, a \$500 grant, is given to educators who have established a model rocket activity in the classroom.

Applications for both the Scholarship Program and the Cannon Education Award are now available. The deadline for scholarship applications is May 1; for the Cannon Award, June 1. More information may be obtained by reviewing the instructions for each of these awards available on the NAR web site or by contacting the NAR Treasurer, Stew McNabb, 12574 Timberline Drive, Garfield, AR 72732; or by calling (479) 359-3990 on nights or weekends.

Pioneer 10—Happy 30th Anniversary!!

(Source:
http://spaceprojects.arc.nasa.gov/Space_Projects/pioneer/PNhome.html)

Launched on 2 March 1972, Pioneer 10 was the first spacecraft to travel through the Asteroid belt, and the first spacecraft to make direct observations and obtain close-up images of Jupiter. Famed as the most remote object ever made by man, Pioneer 10 is now over 7.4 billion miles away (Until 17 February 1998, the heliocentric radial distance of Pioneer 10 had been greater than that of any other manmade object. But late on that date Voyager 1's heliocentric radial distance, in the approximate apex direction, equaled that of Pioneer 10 at 69.419 AU. Thereafter, Voyager 1's distance will exceed that of Pioneer 10 at the approximate rate of 1.016 AU per year). The spacecraft made valuable scientific investigations in the outer regions of our solar system until the end of its science mission on 31 March 1997. The Pioneer 10 weak signal continues to be tracked by the Deep Space Network DSN as part of a new advanced concept study of communication technology in support of NASA's interstellar probe mission. Pioneer 10 will continue into interstellar space, heading generally for the red star Aldebaran, which forms the eye of the constellation of Taurus (The Bull). Aldebaran is about 68 light years away, and it will take Pioneer over 2 million years to reach it.

Launched on 5 April 1973, Pioneer 11 followed its sister ship to Jupiter (1974), made the first direct observations of Saturn (1979) and studied energetic particles in the outer heliosphere. The Pioneer 11 Mission ended on 30 September 1995, when the last transmission from the spacecraft was received. Its electrical power source exhausted, the spacecraft could no longer operate any of its scientific instruments, nor point its antenna toward Earth. The spacecraft is headed toward the constellation of Aquila (The Eagle), Northwest of the constellation of Sagittarius. Pioneer 11 may pass near one of the stars in the constellation in about 4 million years.

Ellis Mountain Rocket Works Single Use 38mm I134 Released

Ellis Mountain Rocket Works has released a new single use 38mm I134 motor (with 590ns and a 4.43 sec burn time). Currently this motor is shipping as a plugged version with tracking smoke (motors with delays will be tested shortly). The new I134 rocket motor may be purchased from Trailing Edge Technologies or Magnum Rocket Hobbies (<http://www.magnumrockets.com>).

Easy Newsletter Contest

This issue's newsletter contest is extremely easy! It's not even hidden inside of an article. All you need do is contact me, the Nagging Editor, with the answers to the following three questions. Everyone who sends me the correct answers by 23 March will be entered into a random drawing for a Quest Spin Fin rocket kit. So, you need not be first with your answers to have a chance at winning the rocket. (Just respond by March 23.) Here are the questions:

1. Who (individual) won Winterfest XI?
2. How many years will it take Pioneer 10 to reach Aldebaran?
3. What Estes rocket was launched during the 1969/1970 Bluebonnet Bowl game on New Year's Eve in the Astrodome?

Good luck!

CARCIS X

CRASH is hosting the tenth annual Colorado Aerial Rocket Circus (CARCIS) on March 16-17 at Bear Creek Lake Park in Lakewood, CO. Bear Creek Lake Park is located off of Morrison Road, north of Highway 285, between C470 and Kipling in Lakewood.

This is a NAR Regional contest and will follow the NAR Pink Book rules. The events are:

- B Eggloft Altitude
- 1/2A Cluster Altitude
- 1/4A Flexiwing Duration
- 1/2A Parachute Duration Multi-Round
- A Boost Glider Duration

The contest will start at 10:00AM each day. The entry fee is \$5.00 for all events for C Division entrants. A and B Division entrants are free. Contact Todd Williams (williams.todd@bigfoot.com) or Bruce Markielewski (markielweski@purplemtn.com) for more information.

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

Rocket Word Search — Find these model rocket terms.

parachute	timer	tower	wadding
altitude	contest	motor	fin
streamer	rocket	ignite	glue
glider	cluster	apogee	duration
eggloft	launch	ejection	recover



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