



The COS-Rocketeer

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

NAR Section #515



Volume 13, Issue 4

July/August 2002



Principal Becky Carter and Assistant Principal Eric Paugh of Stetson Elementary School with gifts presented by COSROCS, for all the years of allowing us to launch at their school.

(Photo by Nadine Kinney)

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Space Fact: NASA celebrated American Independence Day in style in 1997. That was the day its Mars Pathfinder spacecraft landed safely on the surface of the Red Planet.

Fire Ban: A fire ban is now in place for the entire state of Colorado!! This means no launching of model rockets.



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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:

Greg Elder
2860 Woodland Hills Dr. #101
Colorado Springs, CO 80918

e-mail: gelder@pcisys.net

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 cosrocs@yahoogroups.com. To subscribe to the listserv, go to <http://www.yahooogroups.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.

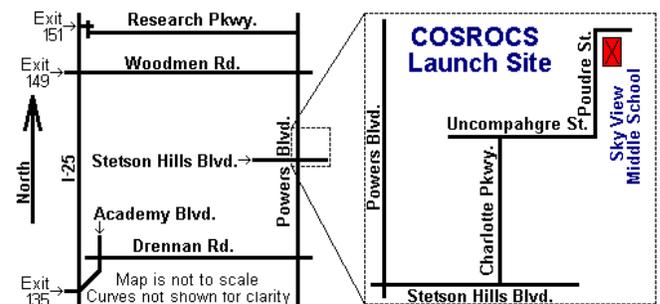
COSROCS Officers

President: Greg Sandras, sandrasg@interserv.com
Vice President: Neil Kinney, nkinney@aecom-sig.com
Section Advisor: Warren Layfield, section515@juno.com
Secretary: Nadine Kinney, photos.by.nadine@pcisys.net
Treasurer: Mark James, markjames@pcisys.net
Librarian: Dave Virga, virga@datawest.net
Contests: Dave Nauer, david.nauer@wcom.com
Web Master: Mark James, markjames@pcisys.net

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

Easier Newsletter Contest Winner. The winner of the newsletter contest from last issue is Stan Huyge. He wins a Mini Styro-F.O. kit. Congratulations Stan! I won't be hosting anymore newsletter contests. The interest in free give-aways just doesn't seem to be there. (Which surprised me, as I assumed everyone would be interested in the possibility of winning free stuff. Go figure.)

Thanks for the Inputs. Thank you to everyone who supplied articles and photos for this issue. Since we cannot fly during the fire bans, I thought I might be short on material due to a lack of launch reports. However, several people came through with material—specifically, Jeff Profitt, Frank Bittinger, Greg Sandras, Tom Dembowski, John Jamieson, Nadine Kinney, and Dave Nauer. This is truly a club newsletter and everyone can contribute something for publication.

The President Speaks!

By Greg Sandras, COSROCS President

The fire ban has most definitely put a stop on our launching until well into the fall. This shouldn't put a stop to our rocket building. Only increase it.

The level 1 camp is proceeding slowly, but much faster than Project Big-Roc. We need to have the list on people who want to work on their level 1 and volunteers (Pueblo and C/S). This needs to be completed by the July meeting so we can start gathering the money and order the rockets. We will have two Level 1 camps; one in the Springs and one in Pueblo. Those working on their level 1 and volunteers need to let us know where they are participating.

As soon as Neil Kinney completes the design for the booster for Project Big-Roc, he and I will start building it. All are welcome to participate. Warren will be writing a letter to Home Depot for donations.

Our dues were due by the 15th of April. If you haven't paid your dues (myself included), please do so with the renewal form included with this newsletter. This will be the last newsletter you will receive until you renew.

We have had numerous suggestions to fill our Saturday launches and build sessions on Wednesdays. This has been a very busy year for all of us, but lets try to get these projects and suggestions going.

COSROCS Says Goodbye at Stetson Elementary School

By Frank Bittinger

On May 23, 2002, COSROCS members participated in a ceremony with school officials to thank Stetson for use of their school as our launch site for the past twelve years. School Principal accepted the plaque presented by club president Greg Sandras and Section Advisor Warren Layfield. An Aerotech Mustang model painted in the school colors of Blue and Turquoise was also presented. Jon Hodge built this model. Thanks Jon. The plaque and rocket will soon be on display in the school lobby. Nadine took lots of group photos.

COSROCS flew at Stetson from 1990 to the spring of 2001. The recovery zone across the street that was empty land for years now has dozens and dozens of new homes with rocket eating rooftops. COSROCS members and competing clubs flew about a thousand rockets a year at Stetson.

Warren told Principal Carter that anytime the school needs Science Fair judges or a Space Day launch they could call us back.

The following COSROCS members participated: Greg Sanders, Tryst Sanders, Tom Dembowski, Nadine Kinney, George Shaiffer, Warren Layfield and Frank Bittinger.

Before we departed I noticed a sign in the school lobby indicating the school name as "Stetson Hills Elementary School". Outside the school, the name on the brick sign reads "Stetson Elementary School". The mystery remains.

Thanks for the memories.

NSL 2002 Launch

By John Jamieson

I recently attended the 2002 National Sport Launch (NSL) with Warren Layfield and George Shaiffer. We got out of Fountain about 5 P.M, Thursday, after the Stetson Hills award presentation. We were really short on space in George's Van, so we strapped my PML Pterodactyl to the roof. We got lots of looks on the highway, and were asked a lot of questions about rockets when stopping for gas. One guy (half joking and half serious?) asked us if we were terrorists!

After driving all night we got to the launch site about 6:30 A.M. local time. We were the second vehicle to arrive. We off loaded some of our gear and ran back into town for some supplies. Nearest supplies are about 20 miles from the Rainbow Valley launch site. Next we set up camp and then help set up the launch range. The Miss-Fire alley set-up is a different type of system than I am used to. Everyone brings their own launch equipment, and the LSO directs the launch making sure no one on the range is too close to the pad that is launching. It appeared to be very efficient, there were no long waits, and many rockets were launched quickly.

Later, Friday afternoon, Mr. & Mrs. Andy Warner, and Mike Jerauld, pulled up in a large RV and camped beside us. Warren, George, and I spent a couple of hours talking to a local guy (John), who had lots of good stories about hunting for snakes and hiking the mountains in the area.

Saturday morning, first day of the launch, I got up kind of early, anxious to get the Pterodactyl in the air. George cooked up some eggs and sausage that really hit the spot! (He cooks a mean bowl of chili too!) I didn't bring any launch equipment so the first order of business is to find someone with a pad to borrow. This was not a problem, there were many friendly people around. As I prepped the rocket Mark James and his daughter arrived. (Yes he is alive). Mark helped me get the rocket on the pad. The Aerotech Hybrid Engine (J-390EFX) boosted it to about 2000 feet. For some reason the electronics did not fire, and it lawn-darted into the ground. Most of the rocket was in pieces about the size of a dime! The ground in Rainbow Valley is very hard. The nose cone weight was only about 2 inches into the ground. The fin can and the engine, were the only parts of it left. Mark and his daughter left back to the hotel that evening and did not come back. Is he missing again? That evening there was a night launch. It was really cool watching the motors burn at night. If you ever get the chance to see a night launch I highly recommend it.

Sunday morning was great for larger projects. Andy Warner launched a V2 that was about 6 feet tall. Unfortunately it lawn-darted. Now I don't feel so bad about my rocket. Warren launched a 4-D engine cluster. The engines all lit and none blew up! Nice flight, Warren. The Gates Brothers launched their full scale Jayhawk on two full N motors! It went straight up arcing our direction the nose cone came down on one chute and the body came down on two chutes that floated about 45 degrees from each other. It sat down gently on that hard ground and remained standing! Which drew many

whoops, hollers and a standing ovation from the crowd. Paul Holmes launched a complex cluster rocket with an M motor in it. A very nice flight, but a hard landing. I took a couple of shifts as RSO that afternoon and evening. That is a job I enjoy because you get to see all the rockets close up. Warren and George took off with Mike Jerauld to the Town Meeting, I hung out at the site and got the chance to talk to many of the Tripoli people who did not go to the meeting. Many people packed up and left after the meeting (Guess some of us have to go to work on Monday).

Monday morning was much less crowded and not as busy as the last two days. I talked with a nice guy and, as there were many locals around, I asked him if he had been around rockets for long. Kind of embarrassed me when I found out he was the President of NAR! Mike Jerauld launched a Mach 10 and it was the best flight of one that I have ever seen. Warren presented a PML Bull Puppy kit for being the "Volunteer of the Launch". He really worked hard and was where ever he was needed all the time. Congratulations Warren.

I had a really good time at this Launch. I have been to a couple of LDRS launches that were huge and most of the well known people in rocketry were there but too busy to have much contact with. This launch was different. It was a good size, and the beautiful evenings were very conducive to hanging out and talking with others. I felt privileged to meet and talk with many of the well knowns in rocketry.

This Old Rocket, Part 4

By Tom Dembowski

Well, its ten-fifteen years later for those of us who grew up with model rockets in the fab 60s, then didn't have the time to stick with it as we went off to college or work. Now older and perhaps a bit more wiser, we dig some old kits out of the basement and get back into the hobby. By now of course, many kits had been discontinued (my cousins still ask me for kits that were deleted 30 years ago!) and a whole new line had replaced virtually all the old stalwarts. There were many other changes too. Engines no longer came in the old blue "mailing tubes" or even the cardboard "diamond" packs of the 60s and 70s; they now are found in the department store bubble packs we are all familiar with today.

Looking back at the catalogs of the late 80s kits, what really struck me was the similarity of a lot of the kits, especially the skill level one and two kits. There didn't seem to be a great deal of difference in the designs. I noticed one boost glider kit, the Dragon Fly, which looked like a rip-off of the old Nighthawk design with a different glider. There was a smattering of scale kits available but no Saturn V (until 1988) or Saturn 1B. The most important of the scale models to this old rocketeer was, of course, the Titan II ICBM kit. Having baby-sat the real thing for 4 years, I could now actually "press the button" and launch one, although the only payload carried on this version was a 12" parachute. I was lucky enough to find this kit at a small Denver hobby store near Lowry AFB while attending class at the base. Also, a version of the same kit with the Gemini space capsule used in the mid-60s exists. I have the original 60s Gemini-Titan, this version was scaled down from that model and much easier to build. I must admit, although not a fan of plastic parts, the twist-on, twist-off plastic piece of the twin engines on the Titan II was nice idea for display purposes. It could be removed and the clear plastic fin unit could be installed for flights. A great idea, combining functionality and convenience.

There were a number of cool scale kits out at the time. The Mercury Redstone was back in production, different than the original 60s kit but easier to build. Very similar was the Jupiter C (except for the paint schemes, you could almost swap out the nose cone units of

the two to make either model). The large V-2 was still in production as well. Perhaps the scale model with the best overall flight performance was the Black Brant II. I have flown this at Stetson on the recommended 'D' engines and it goes out of sight every time. I can only imagine how high it will go on the new 'E' engines.

Not all the newer kits were all that new. I had to smile when I noticed the 1987 catalog listed a "new" kit, the Sky Hook. And yes it still looked identical to its 60s counterpart. Oh well, at least the Streak and Scout was still in production. Another "new" but old kit was the Little Joe II scale model. This time around it was scaled down from a BT-70 tube to a BT-55 and from Series I engines to the mini-engines. Of course, the complicated Apollo capsule escape tower was now a plastic unit. This was a great display kit and flew well too. In production for only a short time, these are quite desirable today.

Even some of the kits you might suspect wouldn't last very long were still being made. I was surprised to discover the "Der V-3" and "Der Red Max", two 70s favorites, were still around. While straightforward rockets, many old timers fondly recall launching these as kids. They combined goofiness with rugged construction that allowed them to be launched countless times.

And finally, the Saturn V made yet another appearance in the catalog pages. This new and improved version dispensed with the need for the clear plastic fin additions, the inner structure was redone to ease assembly and the detailing was improved. This kit commanded big bucks when it went out of production until the 1999 anniversary version was issued. Even with the newer kits available, this 1988 version still brings good money for an unbuilt kit. It seems there will always be a demand for the Saturn V.

Joint Statement on BATF Litigation

By Mark Bundick, President National Association of Rocketry

On April 30, 2002, a hearing was held in the Federal District Court for the District of Columbia, Washington DC regarding the NAR and TRA's request for a preliminary injunction against the Bureau of Alcohol, Tobacco, and Firearms (BATF).

A preliminary injunction motion is one of the more difficult motions to win in Federal court. These motions ask a court to stop a government agency, technically empowered by Congress to do a job, to stop doing something because the agency is acting contrary to governing law. Courts are extraordinarily careful to review these motions before granting them. In order to win such relief from the court, the plaintiffs must establish that they face irrefutable actual and immediate harm from an agency's action, that such harm outweighs any harm to the agency if the injunction should issue, that the public interest warrants issuing an injunction, and that the preponderance of evidence is that they there is a strong likelihood that the plaintiff will win the pending court case on the merits of that case.

Our counsel made strong pre-hearing arguments on all points in their document filings. In addition, they argued a strong persuasive case in court. In fact, during the court argument, counsel brought into the court room actual used rockets and an EZ-Access kit to specifically demonstrated what BATF is trying to regulate. It was clear that the Judge Walton better understood our positions and the difficulties being faced by our hobby. He sympathized with our plight, i.e. that is that the hobby is being overregulated by BATF apparently beyond its statutory authority. However, Judge Walton unfortunately denied our request for an injunction because he did not believe that our harm was sufficiently great especially in the near time frame that this case will be decided on the merits. In essence, the Judge signaled that we appear correct on the law, and that he will

rule quickly when our final papers are filed, but for now he did not want to tell BATF that it must stop regulating our hobby.

We believe the next phase in our case will be to receive from Judge Walton a ruling on the BATF's motion to dismiss the lawsuit. We believe that ruling forthcoming in the next 30 to 60 days. The next step beyond that ruling would be a ruling on motions for summary judgement, which are scheduled to be filed by BATF and NAR/TRA over the course of the next 2 months. Assuming that matters proceed beyond that point, the court would move next to the trial phase if we do not succeed in our summary judgment motion. If we win on summary judgment then it's up to BATF to comply with the Judge's order or to appeal to a higher court.

Our counsel has done a tremendous job in preparing for and pursuing this case. Our thanks to Joe Egan, John Lawrence, and Marty Malsch for their extensive legal preparation and for the hospitality in welcoming us to Washington, DC. And our thanks to Elaine Coppage at Egan and Associates for her work in making our administrative arrangements.

As always, we appreciate the comments, input and support of NAR and TRA members in this fight. If you want to see this effort continue, you can make donations online to the legal fund. Your contributions are absolutely essential for our effort to succeed. We urge you to make a donation to the Legal Defense Fund today, in whatever amount you possibly can contribute. Your support and generosity will be recognized and acknowledged, and you'll be able to say "I supported the fight for an unregulated sport rocket hobby."

As we have further developments, we'll report them here and in our publications, as soon as possible.

Your Pad or Mine

By Jeff Proffitt

I had thought about getting a new launch system for awhile, something that would replace my present system, which consisted of an ancient port-a-pad, and an old solar launch controller that was converted to external 12 volt. I wanted the new system to be portable, but big enough to launch mid-sized rockets, and fill in at some of our smaller group launches when we don't need to set up the big system.

I kept my eyes open, and observed how some other systems were built, and looked around the house to see what materials I might have on hand already, and then made the decision to built my own.

I wanted the power for the controller to come from a portable jump starter pack, basically a 12 volt dry cell, used to jump-start cars. These devices are available everywhere, even supermarkets, and they're cheap, \$29 to \$89. They really do pack a punch too, more than enough to restart a car several times, and with a power inverter, included on some models, you won't be left in the dark if your power goes out.

With this in mind, I began to design the launch controller. I found a wiring diagram in an old Estes publication and compared it to the internals of the Solar launch controller. One quick and inexpensive trip to the local Radio Shack, and I was on my way, but what I still lacked was something to mount the components in, and a power cord. When I was figuring out how to put this thing together, the plug on our vacuum cleaner broke, but the cord itself would still carry power. Yep, you guessed it; I had my 30 foot soon to be launch cable. For the launch controller box, I got a card file from Office Max for \$2. Once I had everything, assembly was easy. I mounted the components in the card file, and soldered everything together, according to the wiring diagram. The only tricky part was cutting into the power cord to attach a cigarette lighter plug.

Now I had my controller, but would it work? I put an igniter in the clips, and with eyes glued to the igniter, plugged it in to the power supply. The igniter was still intact, a very good sign. I turned the key, and the light came on, but the igniter didn't, still good. I pushed the button and success! I had my new launch controller. I subsequently tested four solar igniters simultaneously, and later launched a copper-head ignited rocket, all successfully.

For the launch pad, most of the ideas were borrowed from other pads I have seen. The heart of the pad is a cheap keyless drill chuck to hold the launch rods. For varying launch angles, two "L" brackets are bolted together with a wing nut. This is bolted to two pieces of PVC pipe that form an "X" when the pad is in use.

I made the top leg of the pad long enough to store the rods in, and cap it off with two elbow pipes, which have short pieces of pipe, attached, so all legs touch the ground at the same time. For better contact with the ground, there are two rubber feet on the lower leg, and two holes drilled for anchoring the pad to the ground when those larger rockets are launched. The blast deflector was hand made from a coffee can and has an old "D" motor casing for a stand off.

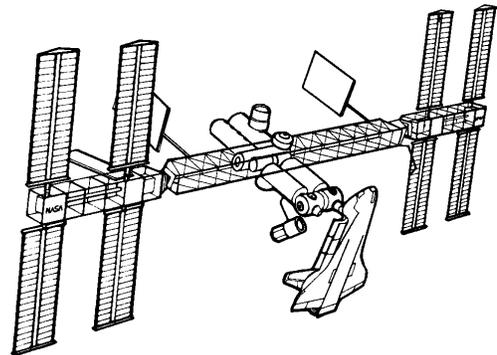
This whole new system cost me less than \$25, not counting the power source and materials I already had, and, even though we haven't had much chance to launch, it does work! Like lot of things in rocketry, if you want something good, you can build it yourself. All you have to do is use your own imagination, and begging, borrowing, and stealing a few ideas doesn't hurt.

Parts List: Launch Controller

- Micro clips
- Push button switch
- 12 volt lamp
- Lighter plug
- Key switch
- 30 foot cord
- Card file box

Parts List: Launch Pad

- Keyless drill chuck
- 2 rubber feet
- Launch rods
- 2 Spikes
- Coffee can and motor casing for blast deflector
- 2 PVC pipes, 1 1/2 "x 5'
- 2 elbows
- 2 "L" brackets
- Asst. nuts, bolts, and washers (your design may vary)



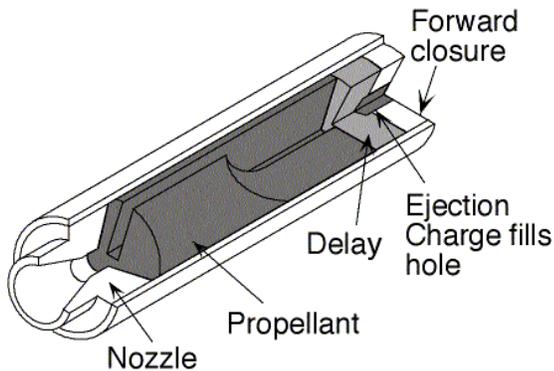
Slow Roasted Rockets

By Tim Van Milligan

Every now and then, someone tells me: "Tim, the ejection charge of your composite motors is too hot. It scorched my rocket pretty good." I thought I'd try to explain why this happens, and what you can do about it in your rockets.

First, the problem is not caused by the ejection charge. It is the after-burning of the delay grain. It is sometimes called the "hibachi effect." Unfortunately, it is a by-product of insuring accurate delay times. I'll attempt to illustrate with words what happens.

In the Apogee single-use motors, the delay grains are short cylindrical slugs of slow burning material. They are located on the forward end of the propellant grain. If you're familiar with reloadable motors, you probably handled a delay grain and are somewhat familiar with what they look like.



Delay grains are designed to be end-burners; which means they burn straight from one of the flat surfaces; in a linear fashion to the other side. This distance (the column length) it burns is called the "web thickness." The web thickness of the cylinder determines the burn time of the delay—a long delay grain burns for a greater time than a short one.

In the small Apogee motors, the delay columns are pretty short (much smaller than a reloadable motor). This makes them more difficult to handle—I've got big clumsy thumbs. So it helps in the assembly process to make them bigger (longer) than they need to be. The other advantage of making them longer is to allow for any irregularities in the burning rate of any particular batches of delay composition. The batches are always pretty good, but I like having some extra safety margins built into the motors.

Because the delay grains are longer than they need to be, a small hole is drilled into the top of the column to "set" the correct delay time for the particular motor. The depth of the hole is what determines the correct delay time. Because what it does is effectively shortens the web thickness of the delay grain. The web thickness, to repeat again, is the distance from the bottom burning surface, to the top burning surface. It determines the overall burning time of the delay. So a deep hole, which makes for a thin web, makes a short delay. While a shallow hole, makes a long delay motor.

To find out how far to drill into the column to set the delay, you must physically assemble a motor, and ignite it to find the burning rate for that batch of delay composition. It is an expensive and time-consuming process. But it allows the delay times for that batch of motors to be extremely accurate because you can tweak the depth of the hole to set the exact delay.

The downside of this technique is that a second burn web is created. This is from the inside edge of the hole, outward to the side

wall of the delay column. Burning of this web thickness doesn't start until the ejection charge has already fired.

So what happens is that after the ejection charge fires (clearing out the hole), the second web of delay composition begins burning. The hot gases flow out two ends of the motor; the nozzle, and the hole that the ejection charge went out. It is this hot gas of particles that causes the problems and roasts the inside of the tube.

You can tell if you ever had this problem, because the parachute is unharmed, but the tube is really scorched. You'll probably also see smoke that continues to billow out the top of the rocket after the parachute is deployed.

The hibachi effect has the greatest damage within one inch from the front of the motor. So I recommend reinforcing the tube in this area. One effective method is to apply a thin layer of epoxy along the walls of the tube in this area.

You might have also noticed that some motors have a worse hibachi effect than others. This is because the length of time that the gases enter the tube is determined by the web thickness. A smaller hole creates a bigger web thickness than a bigger hole. Similarly, a bigger diameter motor (meaning a bigger diameter grain cylinder) has a proportionally thicker web thickness. That is why more people write to me about the 18mm diameter C10 motor than they do the 13mm diameter C6 motor. Plus, the length of the hole determines the amount of particles and heat coming out of the motor. The deeper the hole, the more gas that will cook the inside of your rocket. So a short delay motor will be hotter. (I get a more comments about a C10-4 than a C10-10).

To recap: The hibachi effect isn't a problem if you build your rockets with some extra reinforcement in front of the motor. It has nothing to do with the amount of ejection charge. It is most pronounced in smaller—minimum diameter models, because the internal volume of the tube means that the hot gases can't mix easily with air particles. And the heat coming out of the motor is closer to the external wall of the tube. Also, there is more heat from shorter delay motors than longer ones. Finally, smaller motors are more difficult to make, so unfortunately there isn't a lot that can be physically done to reduce the effect.

You don't need to fear the hibachi effect. Just use common sense when building your models, and you'll be fine.

About the author: Tim Van Milligan is the owner of Apogee Components (<http://www.apogeerockets.com>) and the new rocketry education web site: <http://www.apogeerockets.com/education>. He is also the author of the books: "Model Rocket Design & Construction" "69 Simple Science Fair Projects with Model Rockets: Aeronautics" and publisher of the FREE e-zine newsletter about model rockets. You can subscribe to this e-zine at the Apogee Components web site, or sending any message to: apogeerockets-subscribe@listbot.com This article may be reprinted as long as this paragraph is included with the text.

AeroTech Announces Availability of N4800T Rocket Motor

AeroTech is pleased to announce the availability of the largest certified high-power Reloadable Motor System (RMSTM), the RMS-98/18000 N4800T. Originally developed for the Gates Brothers for use in their Porthos II rocket flown at last year's Black Rock XIII launch, the N4800T will soon be available to the general certified flying public. This motor sets new standards for high-power rocketry with performance and design features never before available.

The N4800T has been tested by the Tripoli Motor Testing (TMT) committee and has been granted Tripoli certification. Technical specifications are as follows:

Hardware designation: RMS-98/18000
Reload designation: N4800T
Case diameter: 98mm (3.875")
Case length: 47.5"
Loaded weight: 33.0 pounds
Propellant weight: 21.1 pounds
Propellant type: Blue Thunder
Mass fraction: 0.64
Initial thrust: 1,483 pounds
Peak thrust: 1,483 pounds
Total impulse: 4,353 pound-seconds (19,361 N-sec)
Burn time: 4.5 seconds
Specific impulse (delivered): 206.3 seconds

The N4800T uses a single propellant grain with a partial slotted-tube grain geometry bonded directly into a phenolic liner. The grain has a small center perforation for high volumetric efficiency with cruciform slots running approximately 1/3 length of the core on the aft end to boost initial thrust and create a more neutral time-thrust profile. The N4800T produces nearly 1,500 lbs of thrust at ignition, then gradually regresses until burnout. A head-end "instant-on" ignition system is being researched and is planned for availability as an option late in 2002.

Blackhawk R&D Announces Mid Power Rocket Line

On Monday June 17, 2002 Blackhawk R&D introduced their brand new Mid Power line of kits. Eight kits, including some never modeled before like the RIM-161 Standard Missile SM-3, SA-19 Grison and SA-11 Gadfly, debuted. All kits feature high power-like thicker walled tubing, lite ply fins and, thick paper transitions. These kits are designed to handle the higher performance of F and G motors and with simple modifications can be used with higher impulse H class motors. Some of the kits released can also be easily modified into staged kits. The kits may be seen and purchased through the Blackhawk R&D web page or one of their fine retailers. For more information surf over to <http://www.blackhawkrd.com>.

Pikes Peak or BLAST XIII

By David Nauer

This year's Pikes Peak or BLAST will be held at the Preble's ranch and will happen during our normal launch date on the first full weekend in September, on 9/6-7. We depart from our normal offering of altitude this year, and will fly only judged and duration events. The contest director will be Greg Elder with assistant Greg Sandras. We will mix three difficult events (weighting factors of 19, 20, and 21) with three easier events (weighting factors of 4, 7, and 9) to make a very doable contest. All events can be flown on either day, except Sports Scale must first be judged before it is flown. If at all possible we will judge Sports Scale on Saturday, and try to allow competitors to fly then if they request.

Our fun event has yet to be confirmed, but we are discussing adding the long-delayed "Razor Rally" event to the mix. We must yet coordinate how it will be done, and that should appear in the next edition of the COS-Rocketeer. Our events are:

1/2A Rocket Glider	19
B Helicopter	21
1/2A Parachute	7
B Streamer	9
Sport Scale	20
Open Spot Landing	4

Our goal this year is to have some fun over two days. Thus, no altitude to drag down responsibilities of competitors. Also, some fun events like spot landing, parachute, and streamer. We wanted to have some challenges, so put a rocket glider and helicopter event in. And we wanted to maintain some tradition, so we have our normal judged event. There is a mix for everyone.

A note on the weather and fire bans. We are hoping things will be clear by September (e.g. no bans, but more importantly, no dry grasses around the Preble ranch), but if we have any ban in place or assess any danger to our host, the event will be further delayed, so hold your breath for rain and better weather!

1/2A Rocket Glider Duration (WF19)

Rocket Gliders require the entire rocket to remain in one piece throughout flight. The model must act as a stable rocket going up, then change flight characteristics to attain and maintain a stable glide. This particular event is challenging in that 1/2A impulses must be used, and since the Apogee 10mm engines remain off the contest certified list, this most likely means 13mm 1/2A3 motors will be used. Like most duration events, you get two flights that are added together. You must return one of the two flights.

This is a very challenging event if you've never built a rocket glider, and few rocket gliders are available on the market. Check out QCR (Ken Brown's competition company) as he has plans and kits. Most glider kits out there are boost gliders (a pod separates from the glider) which ARE NOT legal in this event!

B Helicopter Duration (WF21)

This event requires the model to be recovered via "autorotation", meaning some type of spinning device or method is needed to slow the rocket's descent to a safe level. The model must be single stage and must remain in a single piece throughout flight. You get two flights that are added together and must return one of your two flights.

If you buy a kit, remember that it must keep the rocket in a single piece. So, an ejected nose cone with blades doesn't cut it, but several kits in the past have qualified. Look for something which stays together!

1/2A Parachute Duration (WF7)

This event is harder than it appears, but is simple in concept – recover a rocket by parachute recovery for the longest times. Two flights are added together, and one of the two must be returned. The model must remain in a single piece, must eject a parachute (which needn't open!), and keep the engine intact.

Competitive rockets will be simple, light, and capable of putting a medium parachute in the tube. A 13mm tube using a 1/2A3-4T motor with a 1/4mil 15" parachute works fine for me. Of course, you can qualify (who knows, you may even place!) with an Alpha on a 1/2A6-2 using a 12" plastic parachute, so you have to decide how much work you want to put into this event.

B Streamer Duration (WF8)

The competitor must fly a streamer recovery model under "B" impulse. The model must be single stage and remain in a single piece throughout the entire flight. A streamer is defined for this event as a piece of cloth, plastic film, or paper, whose shape is approximately

rectangular. The streamer must have a length- to-width ratio of five to one (5:1) or greater and have a minimum area of 100 square centimeters. The streamer and model must be connected by only a single line or cord, attached at the narrow end of the streamer. The cord may not be connected to either the streamer or the model at more than one point (e.g., no yokes are permitted). The streamer may not be cut, slit, or otherwise altered in such a manner as to affect its nature as a simple connected plane.

Much like other duration events, two flights are allowed and the results are added together. One of the two flights must be returned. Again, much like parachute, you could qualify with a simple B6-4 launch of an Alpha using a paper streamer, or you could go for something higher performance using Mylar streamers.

Sport Scale (WF20)

This is the only judged event of the NAR portion of the contest. You must build a scale model with a modest level of documentation, and, after judging, safely fly the model with the least amount of damage. Other than adhering to weight limits, you can choose your engine as long as it is contest certified.

Remember, you **MUST** supply minimal documentation with your entry or it will be disqualified. That minimum includes:

The contestant is required to submit data to substantiate his/her model's visual resemblance to the prototype. Minimum allowable data consists of:

- A line, tone, or color drawing; or
- One or more clear photographs, halftones, or photo-reproductions of the prototype, sufficient to show the outline and general configuration of the prototype modeled

Any entry not accompanied by the minimum allowable data as listed above shall be disqualified. The Judges may disqualify any entry that, in their opinion, is accompanied by substantiation data of such poor quality as to fail to convey a satisfactory impression of the outline and general configuration of the prototype.

However, there is **MORE** required for a good score. Additional documentation (per the Pink Book) include:

Suggested options include:

- One or more clear photographs, halftones, or photo-reproductions, including at least one in color. The number of these submitted should be sufficient to substantiate additional views of the model on which the color pattern and markings differ significantly.
- Other published pictorial representations, such as a color painting, or a drawing from a magazine.
- A detailed written description, from a reliable source, of the color scheme and markings, accompanied by a drawing of the prototype on which the color scheme and markings described have been included. This drawing may be neatly made by the modeler.

Any entry not accompanied by data substantiating the finish, color, and markings of the prototype shall be given zero points for Finish, Color and Markings, but shall not be disqualified from the competition.

You will be judged on the following criteria:

- Similarity of Outline: 200 points
- Finish, Color, and Markings: 200 points
- Degree of Difficulty: 100 points

- Craftsmanship: 300 points
- Flight Points (Mission): 200 points
- Flight Points (General Flight): 100 points

Open Spot Landing (WF4)

This event requires the modeler to launch a given rocket/engine combination for the first time that day, and for the modeler to come as close as possible to a designated spot on the ground. Any legal recovery method may be used, but the recovery **MUST** be safe. The model must remain in a single piece and retain its engine.

Please consider reopening your launch activities after this long, dry summer by trying some competition. With the fire bans in place today, make your rockets now!

Fly High, Fly Safe!

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. (Note: All launches canceled until further notice, due to the fire ban.)

Jun:	Sport Launch, Peyton, 9AM—Canceled
6 Jul:	Sport Launch, Sky View, 9AM—Canceled
10 Jul:	Business Meeting, 7PM
11-14 Jul:	LDRS XXI, Amarillo, Texas
20 Jul:	Sport Launch, Peyton, 9AM—Canceled
3 Aug:	Sport Launch, Sky View, 9AM—Canceled
3-9 Aug:	NARAM 44, McGregor, Texas
14 Aug:	Business Meeting, 7PM
17 Aug:	Sport Launch, Peyton, 9AM—Canceled
7 Sep:	Sport Launch, Sky View, 9AM—Canceled
11 Sep:	Business Meeting, 7PM
21 Sep:	Sport Launch, Peyton 9AM—Canceled

Space Facts

Born on July 22, 1784, Friedrich Wilhelm Bessel, a German astronomer and mathematician, discovered the parallax of the fixed star 61 Cygni. This was the first fully authenticated measurement of a star's distance from the Earth.

The first space station in science fiction was in Edward Everett Hale's 1869 story "The Brick Moon." The "moon" of the title was a set of brick spheres and arches, launched into space by gigantic flywheels.

The space shuttle, including its booster rockets, weighs about 4,400,000 pounds at liftoff. The space shuttle orbiter, the reusable craft, weighs between 200,000 and 240,000 pounds, depending on the weight of its payload.

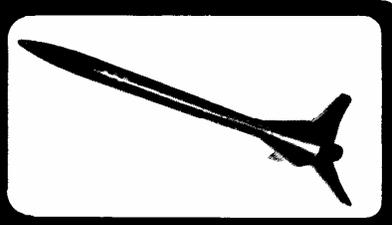
Estes Industries Rocket Plan No. 66

SCOTT - B

JUNE '69

DESIGN OF THE MONTH WINNER

by David M. Olsen Platteville, Wisc.



PUBLISHED AS A SERVICE TO ITS CUSTOMERS BY ESTES INDUSTRIES, INC., BOX 227, PENROSE, CO. 81240 ©ESTES INDUSTRIES 1969

PARTS LIST

1	Nose Cone	BNC-20N
1	Body Tube	BT-20B
1	Body Tube	BT-20G
3	Body Tube	BT-20M
2	Engine Block	EB-20A
1	Sheet Balsa Stock	BFS-30
1	Centering Ring	RA-2050
1	Shock Cord	SC-1
1	Screw Eye	SE-1
1	8" Parachute Kit	PK-8
1	Launching Lug	LL-2B
2	Nose Cone Weights	NCW-1

In addition to the parts above you will need scissors, white glue, a model knife (or razor blade), masking tape, paint brush and paint or dope. Also postcard and carbon paper.

1 MEASURE, MARK AND CUT TUBES

Install Engine Blocks

Draw all location marks and guide lines on all tubes as instructed for each below.

Install both engine blocks as shown. Mark an old engine 1/2" from one end--hold it by the end closest to the mark and use to position upper stage engine block.

Spread glue inside body tube and locate an engine block as shown.

Mark location of front edge of shroud 23/32" exactly.

Mark location of RA-2050 1/4" exactly.

Fin Guide lines are the heavy arrows.

Smaller arrows are to mark the cut lines for the BT-20M Fairing Tubes.

Lay guide on a flat surface. Place tube over proper part of guide and mark as instructed.

Spread glue inside end of tube--install engine block with rear edge flush with tube.

Mark all 3 tubes as shown. Cut away the shaded part and discard. See the general view for when and where to glue these parts.

PATTERNS 'N' INFO

2

STABILIZER SHROUD PATTERN

Trace onto heavy paper or postcard material, cut out, form and glue. See general view for location and fitting.

Shroud forming is easier when you pre-form the shroud--hold a pencil or dowel firmly against the shroud material...

...gently, but firmly, pull the shroud up and across the pencil, forming a shallow, uniform curve in the shroud. Repeating will deepen the radius or the curve.

A great amount of finishing preparation can be done before the fins are glued in place...

This edge is sanded flat--it will be glued to the booster tube.

Leading, tip and trailing edges are sanded round. Sand both sides of each fin flat and give each fin an additional sanding with extra fine sandpaper or sanding material.

FIN PATTERN (3 req'd.)

Trace onto card stock

Grain

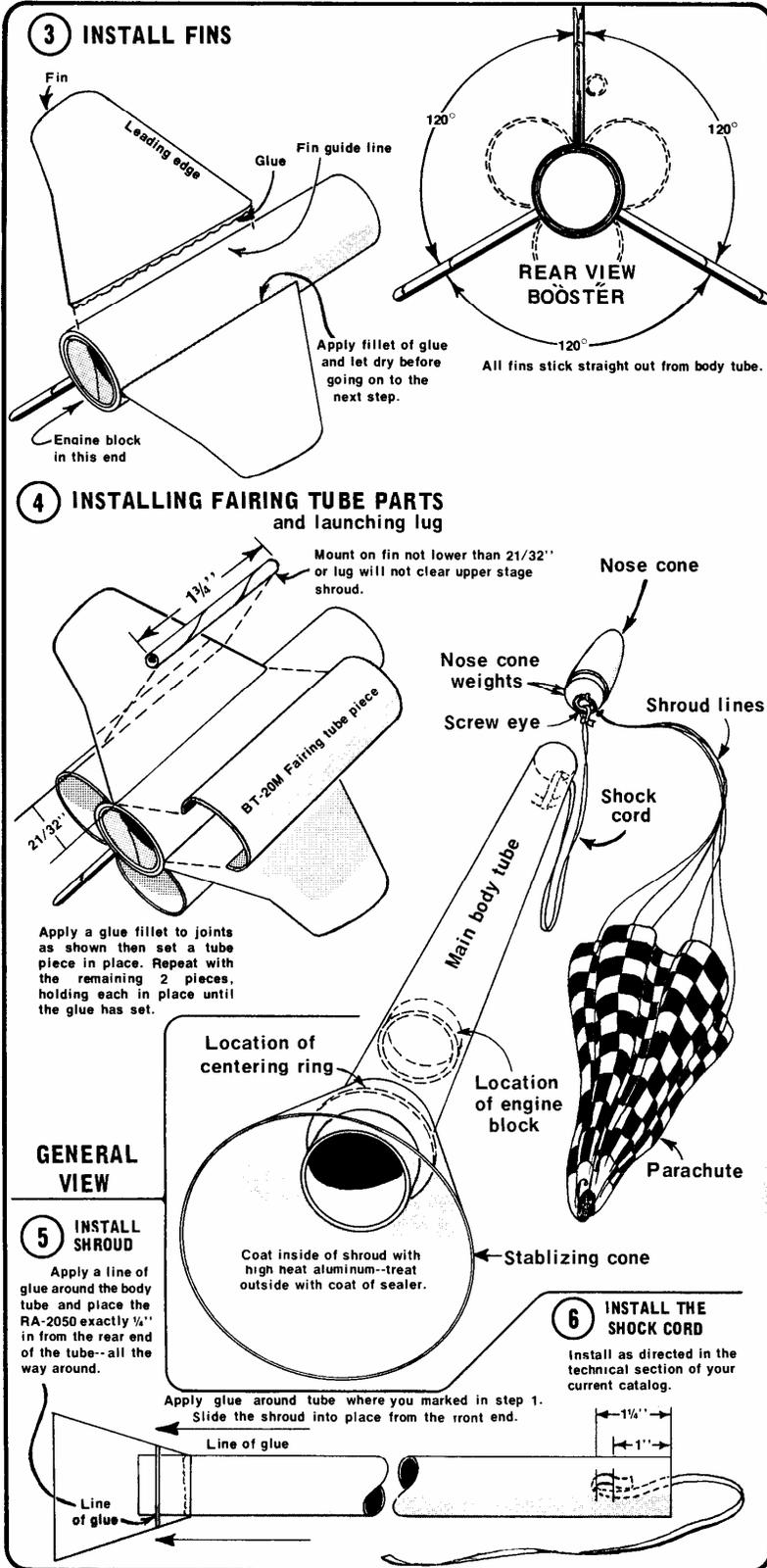
Leading edge

Glue this edge to booster

Pattern layout on Balsa fin stock

Pattern

Balsa fin stock



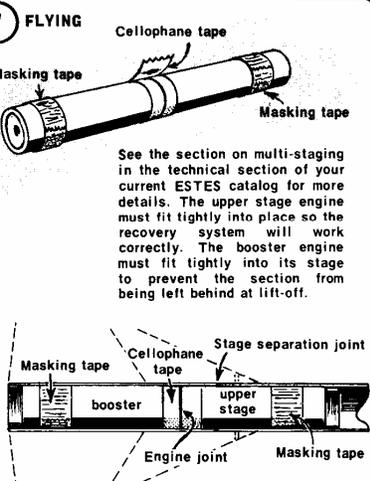
MORE WINNERS! DESIGN OF THE MONTH CONTEST

Design of the Month contest winners for the months of April through September, '69 were recently announced by the Estes Industries judging staff.

The First Place \$50 award for April went to Dale Olesberg of Coeur D'Alene, Idaho for his 3-stage *Sky High* rocket. Top honors for May were given to Justin Otten of Grand Rapids, Mich. for a combined control panel-launcher unit. The winner of the June contest was Dave Olsen of Platteville, Wisc. with the two-stage *Scott B* model. July honors were garnered by Bob Houston of Fremont, Nebr. with his *SST Scorpion*. The August award was given to Ivan Joe Sandman, Lewistown, Mont. and his *Blue Lightning*. September went to Douglas W. Johnson of Randolph A.F.B., Texas for the twin-engined *Antennoid - 3*.

All Estes rocketeers are encouraged to enter the Design of the Month Contest. Plans for rockets, launchers, instruments, etc., may be entered. A new contest begins on the first of each month so entries compete only with other entries received in that month.

Any plan or design received at Estes Industries that is not specifically addressed to some other contest or department is automatically entered in the Design of the Month Contest. For complete details, see the contest information in your current Estes catalog.



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COSROCS Membership Form

Date: _____
Name: _____
Other Family Rocketeers: _____

Address1: _____
Address2: _____
City: _____ State: _____ Zip: _____
Phone Number: _____
Email: _____
NAR Membership Number: _____ Certification Level: _____
TRA Membership Number: _____ Certification Level: _____
Years in Rocketry: _____

Areas of interest:

- Low Power Mid Power High Power
 Staging Electronics Clustering
 Gliders Competition Just Having Fun
 Other: _____

Reason for Joining COSROCS: _____

A family membership is \$20.00.

A single junior membership is \$5.00.

Membership runs April to March - Prorate by 1/4 year.

Send membership form along with check or money order to the address listed below. Please allow 4 weeks for the newsletter to begin arriving.

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



Warren Layfield and George Shaiffer at NSL 2002.
Photo by John Jamieson



A red Broadsword takes to the sky at
CRASH's May launch.
(Photo by Greg Elder)



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