



The COS-Rocketeer

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

NAR Section #515

2002 LAC Award Winner!



Volume 13, Issue 5

September/October 2002



The Rockwell Trophy (LAC Award) presented to COSROCS for producing the best NAR Section newsletter for 2002.

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Fire Ban: The fire ban for Colorado is still going strong! Just a reminder, please do not launch any rockets during the ban. All COSROCS launches are canceled while the fire ban is in effect. This is a good time to build all those kits that have been sitting on our shelves.



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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 cosrocs@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 and 2002 for having produced the best NAR Section newsletter.

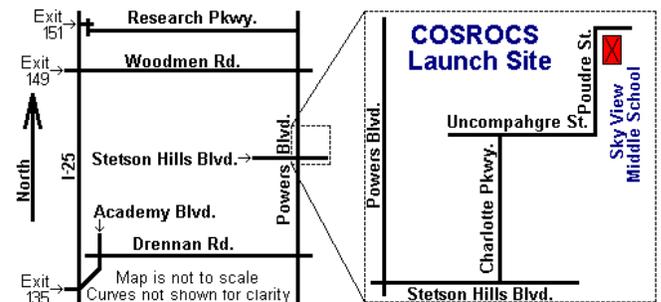
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Launches and Meetings

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

COSROCS Wins LAC Award. During the NARAM 44 awards banquet, COSROCS was announced as the 2002 winner of the Leadership Administrative Council (LAC) award and was presented with the Rockwell Trophy. Though no COSROCS member made it to NARAM this year, Todd and Kathleen Williams of CRASH accepted the trophy on our behalf. They were kind enough to bring the trophy back from Texas for us. Thank you very much Todd and Kathleen!

The LAC Award is given to the NAR section that produces the best newsletter during the year. This is the second time in three years that we have won this award. We could not have won it, if members had not contributed articles and photos for The COS-Rocketeer. I'd like to thank everyone who provided material for the newsletter during the past year.

For those not familiar with the LAC Award, it consists of the Rockwell Trophy—a traveling trophy that has been passed to winning NAR sections since 1969. We get to keep the trophy for a year, until it is passed to the next LAC Award winner. One tradition associated with the trophy is that each winning section places “something” (usually model rocketry memorabilia) inside the trophy’s annex. Only the members of the current winning section are allowed to look inside the annex. I will bring the trophy and annex to our next meeting for everyone to view.

New Editor for Next Year. In January, I stated that this would be my last year as newsletter editor. I have been hoping that another member would step forward to volunteer as editor for next year. Tom Dembowski has taken that step and will server as our editor starting in 2003. Thank you very much Tom.

New Address. I have recently moved. In case anyone needs to mail anything to me, my new address is listed on page 2.

Section News

COSROCS Pins. Warren Layfield suggested making COSROCS pins, with NAR level certs on them, as a way to raise funds for our section. The same company that created the LDRS 21 pins would make the pins. The current COSROCS logo would be used on the pins. We will sell them for \$5 each. A vote was taken at the July business meeting and all were in favor of the pins. When the pins are available, an announcement will be made on the COSROCS listserv and the newsletter.

Level 1 Camp. We now have everyone registered for the Level 1 Camps to be held in Pueblo and Colorado Springs. If you have an interest but did not register, contact Greg Sandras. If someone who is registered drops out, you may be able to take his or her place. In addition, Greg is purchasing one additional level 1 kit in case someone decides at the last minute that they want to participate.

Rocket Silo RMS Schematic Boards. Greg Sandras has talked to Rocket Silo about getting a group discount on their 29mm RMS schematic board. It is designed to be used without the directions that come in the Aerotech packages. This would be an excellent addition to ANYONE (including level 1 camp participants!) who uses Aerotech RMS reloads. Let Greg Sandras know if you are interested in one. The cost should be around \$19 - \$20 with the discount.

Portales Airshow. On September 27-28, an airshow is being held at the Portales airport in Portales, New Mexico. A model rocketry make it/take it event will be held during the show, as well as high power rocketry launches. Warren Layfield has been coordinating the rocketry activities. If you are interested in

participating, contact Warren. He needs to know in advance who will be flying rockets at the Portales Airshow.

Mass Rocketry Launch. Dave Virga is interested in COSROCS attempting to set a record for a mass rocketry launch. Two or three years ago there was a section that launched about 100 Estes Mosquitoes simultaneously. Dave is thinking about a similar type launch. (Maybe we could have a massive launch of egglofters and see how many eggs survive?) Let Dave know if you are interested and if you have any suggestions for this type of record setting launch.

New Kits. Some new model rocket kits have been spotted at Hobby Lobby and other hobby stores in the local area. The Estes re-release of the classic Orbital Transport is out. It is very similar to the original kit, with the exception of plastic nose cones. Also, Quest has some new, colorful kits out. They are easy to build kits, featuring pre-colored body tubes, plastic fin units, and decals.

High Flight 2002 – September 28 and 29

By Frank Bittinger

On Saturday, / Sunday September 28 and 29, 2002 COSROCS (The Colorado Springs Rocket Society) and CSAS (The Colorado Springs Astronomical Society) will jointly hold High Flight 2002 at Preble Ranch in Payton.

Events include Daytime Rocket Launches by COSROCS (if the dreaded FIRE BAN ever gets cancelled, otherwise COSROCS may be forced to get water rockets), a joint COSROCS/CSAS pot luck supper, twilight rocket launches, CSAS will set up telescopes and host a STAT PARTY for all to view the evening sky. An overnight campout is planned, so bring your camping gear.

Last year many rockets were flown at the daytime portion with CSAS members eagerly watching. Frank and the Prebles later cooked burgers and dogs on a couple of gas grills. At twilight last year, COSROCS members launched three more rockets. Some were recovered Saturday night and other(s) were recovered Sunday after sunrise. Bring your blinken beacons, clear payload sections and glow-in-the-dark sticks.

Last year CSAS had 6-12 telescopes between 5 and 16 inches in diameter. A fun time was had by all having a blast and getting starry eyed.

Folks should arrive at about 2 pm-ish to fly and socialize. The current El Paso County FIRE BAN is acknowledged so bring your water rockets. Bring something for potluck. Call Frank at 488-8940 for meal coordination.

Again, our thanks to the Prebles for hosting this event.

Joint Statement on ATF Litigation

Mark B. Bundick, NAR President

Bruce E. Kelly, TRA President

July 4, 2002

On June 24, 2002, Judge Reggie B. Walton, Federal District Court for the District of Columbia, ruled on the Bureau of Alcohol, Tobacco, and Firearms (ATF) motion to the NAR and TRA's civil lawsuit against ATF. ATF's dismissal motion sought to remove Counts 1, 2 and 4 from the litigation. Our counts contended that:

ATF has not properly determined that APCP functions by explosion, ATF's explosives list improperly published without legally appropriate notice and comment rulemaking, and ATF's 62.5 gram limit for exemption from regulation was arbitrary in both its selection and promulgation.

Judge Walton's ruling states, "ATF's motion to dismiss counts one and four of the amended complaint is denied and granted as to count two on statute of limitations grounds."

This ruling means that four of our five counts in the litigation remain before the Court to be decided.

Count 2, the explosive list publication, was removed due to the statute of limitations being passed; the initial explosives list was published in 1971 and our suit was brought more than six years after that time. However, Judge Walton's ruling also contains a clear message for U.S. federal agencies to follow the proper procedures when promulgating regulatory rules. Quoting again from the Court's ruling:

"It is the Court's conclusion that ATF's pronouncements concerning the non-exempt status of sport rocket motors that use more than 62.5 grams of ACP amount to rulemaking. There being no claim that notice and opportunity for comment were afforded, ATF's motion to dismiss count four of the amended complaint must be denied."

Thus, ATF's arguments against our most important and critical positions have been denied, and our case remains largely intact."

You can read the full text of the Court's opinion online as a 1.4MB PDF file at:

<http://www.nar.org/courttopinion020704.pdf>

While our case obviously has strong legal merits, without the continued and excellent effort of our legal team, Joe Egan, John Kyte, John Lawrence and Marty Malsch, we would not have progressed this far. Association members should be justifiably proud of the extremely capable effort your team has put forth to secure an unregulated sport rocket hobby. Our thanks for the quality effort expended by our counsel.

Even though this ruling is not a final victory for us, it is a major step towards securing the future of our hobby.

Now you can continue the push toward that ultimate goal. If you want to see this effort and success continue, you can do so easily by making donations online to the legal fund at:

<https://secure.consumersinterest.com/nar/NARfrompres9911.html#donorform>

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 (NAR web site) and in our publications as soon as possible.

Pikes Peak or BLAST XIII Update

By David Nauer

At the August COSROCS business meeting, we discussed the realism of launching on 9/7-8 in El Paso County. No rain is in the forecast, and more than a handful of rainy nights will solve our fire danger problem. Also, we are concerned about the safety of our host (Preble ranch)—we **will not** launch in dry conditions at the ranch even if *all* bans were to be lifted.

As such, we do not feel it is realistic for our club to plan launching within a month, perhaps well into late fall! The club voted unanimously to cancel the PPOB XIII launch dates of September 7-8;

we instead have decided to leave it as a planned launch, but to wait until we feel confident the El Paso County (and state!?) bans are lifted and it is safe to launch at Prebles. We will schedule the date for the contest at that point. So please plan on continuing to build for these events—we will hold this contest—it could preclude or cancel Winterfest this year though.

One other possibility would be "borrowing" the CRASH launch site (when they are able to launch post-fire bans) if CRASH is willing and we can get things organized. It is a regional after all! I'd prefer to launch at Prebles if at all possible.

Thanks folks. You can contact Contest Director Greg Elder or myself (David Nauer, Director Contests and Records for COSROCS) if you have comments or questions.

Certifying Level 1

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The most important step in certification is to connect with someone who will serve as your mentor before starting. This should be someone you know and respect, who has been certified to the level you seek for some time. That person's job is to provide advice and guidance through the process of selecting the kit, construction, selecting (and reloading) the motor, dealing with government regulations, getting launch equipment, and making the flight. That person can also administer any test. What follows are my words of wisdom as a mentor.

The first rule of certification is to strictly follow the KISS principle: Keep It Simple Stupid! Certification is your first HPR flight. It's a time to do something simple and reliable, as much like what everybody else flies as possible. Big, fat, slow, and low are the key words.

When you consider what the purpose of certification is, very much like getting a drivers license, and that an HPR rocket can be every bit as lethal as a car, then pushing the envelope for a certification flight starts to appear reckless. It also makes you wonder why the written test is at level 2 instead of before you ever make your first flight.

Save the creativity and envelope pushing until later. Certification flights are not the place to try all sorts of new things, to experiment with electronics, to bust Mach 1, to try to achieve orbit, or to loft that fancy payload. You want a simple stable flight that goes high enough for safe recovery, but not so high that recovery will be a problem. Altimeters and dual deployment are neat, but not if you've never done it before. Ditto for staged and/or clustered models. Go for a single motor of the minimum total impulse necessary for your certification level, and motor ejection. The odds should favor success, not failure.

The only exception to this rule is the likely use of reloads. Unless you have a BATF Low Explosives User Permit and approved storage, acquiring and storing an expendable motor for certification can be a problem. Easy Access reloads are a way for everyone to get through level 2 with none of the restrictions. For your first flight, you may find a mentor who will loan you a casing, putting off the expense of getting into reloads. [This may or may not change radically if the NAR does not win their lawsuit against the BATF. It is possible that no one will be able to fly HPR without an LEUP and a Storage magazine.] I strongly recommend some experience with E-F-G reloads before moving up to your H certification flight.

Whatever you fly, positive motor retention is a must. Masking tape and friction fit just do not belong in LMR or HPR rockets. For some strange reason, I recommend something like the Kaplow Klip. See the October 1996 article in *Sport Rocketry* or visit <http://www.pleimling.org/le/Phantom4000.pdf>.

And now for my personal prejudices. I dislike excessive plastic parts. This rules out the Aerotech kits. Similarly most of the NCR/Estes kits are inappropriate. In addition the NCR kits have motor mounts that won't hold standard LMR or HPR motors unless modified (replace the 28.5mm MMT with a standard 29mm MMT and sand the holes in the centering ring to fit, or simply peel out the NCR tube.)

Another controversial issue is glue. Many will tell you that nothing but epoxy is acceptable for HPR. I've found that at least through level 2, as long as you are building paper and wood kits, yellow carpenters glue (Titebond, etc.) is perfectly acceptable. It will produce a glue joint that is stronger than the paper or wood.

When using epoxy, avoid common hardware store brands. Get something either from a hobby shop that sells to RC modelers, or from a place that supplies either homebuilt boat or aircraft markets. I don't like 5 minute epoxy at all, as it doesn't leave enough time to mix well and apply, doesn't penetrate well, doesn't flow into cracks, and doesn't withstand heat. Get a good 30 minute epoxy, and expect it to take overnight to get a full cure. Or use one of the professional adhesives that uses a non 50:50 mix ratio. SystemThree offers a \$10 sampler kit that is ideal for your first few models. The book alone is worth the price.

I don't like short stubby rockets in general, and especially for certification flights. They have a lesser margin of stability, and can suffer from more severe tipoff if there is any wind. Avoid rockets like the Lil Nuke, Minnie Magg, Warloc, and similar designs.

Finally, unless you have experience with the material, avoid phenolic tubes and fiberglass fins for your certification flight. The phenolic can easily be cracked, and the fiberglass is harder to shape and can produce dangerously sharp edges. Once you have some experience, these can be great, but if you are used to wood and paper, stick with them at least for now. If you've built one of the smaller phenolic kits (PML IO, Callisto, Phobos) go ahead and use phenolic for your HPR introduction.

Level 0:

Level "0" doesn't exist, but should be your first step. If you've never flown anything since your exposure to model rockets, perhaps twenty years ago as a kid, take a step or two back, and build some Large Model Rockets, and get some F and G flights under your belt. Learn about HPR construction techniques, composite motors, and if appropriate, reloads. Learn about working with plywood instead of balsa, nylon chutes, heavy shock cords, and other things that carry over to HPR.

In this category, look for a rocket about 2.6" diameter, something like the LOC Graduator, THOY Hornet, PML Explorer (much heavier, G minimum, or the smaller and lighter IO), Aerotech Initiator, or NCR Eliminator. If you want to get into reloads, get the RMS 29/40-120 reload casing.

Motors like the NCR F62, Aerotech F20, F23, F25, F50, G35, G38, G40, and G80 expendables, or the E16, E23, F40, F52, and G64 reloads are good for these rockets. I recommend against the classic BlackJack motors (F14, F22, G33) until you have more experience. They are harder to ignite, build up thrust slowly, and in the wind can result in severe tip-off. For all of these motors except the Gs, use the shortest delay available. For G flying in these rockets, you may want to move up to the medium delay, or check the recommended motors for your rocket.

With an adapter, most of these rockets can all fly on 24mm motors like the E15, E18, E28, E30, F21, F24, and F39. D motors, especially the black powder D12 are insufficient for rockets of this size. Again, avoid BlackJack motors like the E11 and F12 until you have more experience and have a really calm day.

Note that all these rockets likely need FAA notification to fly, as they will be over a pound at liftoff. As you move into HPR, you will find that just about everything H and above will need an FAA waiver. A few HPR models under 1500g and using H motors up to about 240 ns can be flown with notification only. Note that NIRA normally has FAA notification to 3000' for our local launches.

Level 1:

My Level 1 certification strategy is pretty simple: use just about any 4" diameter rocket, and either the H128-SW for a 29mm motor mount, or the H123-SW for a 38mm motor mount. If that isn't the right motor for the rocket, you have the wrong certification rocket!

Why?

The 4" rocket because on a minimal H they will go low and slow, and not pull too many Gs. It makes the flight less stressful, recovery easier, and a positive result more likely.

White Lightning for certification because it's not as big a kick as Blue Thunder, thus stressing the air frame less; and not as hard to ignite or slow to build up thrust as Black Jack, which can cause severe tipoffs in the breeze. The H128 or H123 because those are the smallest legal WL certification motors for 29mm and 38mm AT reload casings respectively. Short delay because that's what a typical 4" rocket with one of these motors needs.

My preference is for a model light enough to be test flown on a G that keeps it under the 1500g limit so it can be flown without a waiver. The H123 and H128 will easily lift a 3# rocket, and can handle a rocket over 5# without be underpowered.

One of my favorites in this range is the LOC-IV. Built stock it can take just about any 29mm motor available. You can test fly it on F50 and G motors. With an H128-SW, it's really the ideal certification rocket. Several other LOC 4" rockets are usable as well.

The Aerotech Sumo is designed for Level 1 certification, but is a bit stubby for my tastes. The G-Force can be modified to hold H motors.

Other kits that are known to work: Binder Excel or Excel Plus, LOC Expediter, PML Tethys, 1/4 scale Patriot, or Small Endeavour on a H123 (too heavy for Gs). Rocketman has several kits suitable for L1 but again most are too heavy for flying on a G.

Two popular models that can handle level 1, and if built solidly take you on to level 2 are the LOC EZI-65 or THOY Falcon. Both of these rockets will need an adapter for 38mm or 29mm motors. I'd recommend the 38mm adapter and an H123-SW for these rockets. Built to minimize weight, or without their payload sections, either of these will even fly on a G64 or G80. Most of the 4" PML and Rocketman kits will fly on H-J motors as well.

This Old Engine

By Tom Dembowski

Well, as the Stones would say, "this could be the last time." Our editor will soon be stepping down and I may be asking for newsletter contributions next time instead of writing them (or more likely, maybe both). This time I thought I'd talk about some old engines. Way back in the early days of rocketry, there weren't anywhere near the range of choices available today. In fact I remember when it was a BIG DEAL when the new 'D' engines first came out (stop laughing you high power geeks). But for the selection of low end engines (1/4 A through C), there were many to choose from. Also, there once existed one very famous 'B' engine (no longer made) which is still revered today.

I'm not going to go into the very early 60s engines which used different terminology (for example, an A8-3 engine was an A.8-3, a C6-0 booster engine was a C.8-0 engine). Ask Warren sometime for the story behind that, he can tell it much better than I can. But if you come across a very old engine with one of those strange numbers on it, that's when it's from.

Another series of engines that no longer exist are the old "Series III" line. Prior to the mini-engines, the "T" series we know and love today, the early mini-engines kept the same diameter as the standard engines but were one inch shorter (for a length of 1.75" vs the standard 2.75"). They used a 'S' suffix to distinguish them from the standard motors. The 'S' series was made in impulses from 1/4A to A in single, upper and booster configurations (except there was no 1/4A 'S' booster engines for obvious reasons). Many famous kits like the Birdie and the Sprite used these engines. Many Series III kits were later modified for the new 'T' mini-engines but some like the Sprite were relegated to history.

The standard Series I engines ranged from a 1/4A3-1 to a C6-0. There were many combinations of impulse and delays to choose from including the A5-2, 1/2A6-4, A5-4, A8-5, B4-6 and even a 1/2A6-0. Many of these favorites which were phased out over the years are still sought after today.

The engines most fondly remembered are the "Series II" engines, the classic B-14 series. Four were made, the B14-5, 6, 7 and 0. The middle two delays were considered upper stage engines, and of the two, the 6 is by far the harder to find nowadays. These were made into the mid-70s. The very high thrust over a shorter period (for example a B6-4 had a maximum of 48 oz thrust over 1.2 seconds, a B14 had 7 lbs maximum thrust over just .35 second, if old catalogs are to be believed). These engines could throw a heavy rocket off the pad very quickly. They always made for some spectacular lift-offs. And three clustered together in a Ranger or a Cobra were just too cool.

Around 1970, the 'D' series made it debut. Although bigger than the standard motors, many larger kits could be adapted to handle the larger motor safely. It temporarily satisfied the growing thirst for more power amongst long time rocketeers. It continues to be a very popular series of engines today, easy to work with and very impressive thrust. It is a very nice compromise between the lower end motors and expense of high power engines.

The 80s saw the beginnings of high power rocketry. Its taken motor development to power never dreamed of in the 60s. While some (E, F and Gs) can be bought at your local hobby store; with the proper credentials and experience, you can launch all the way up to M and N class motors).

Over the years many of the older engine types were phased out. The basic standard engines remain but with far fewer choices than before. The Series II and III motors have not been manufactured in 30 years now (can it really be that long??!!). Many of the 'T' series mini-engines and standard engines have never been discontinued (although some have gone and come back over the years). The selection of engine types has remained fairly constant over the last two decades. For those specialized motors (for contests and such), there are many available from a number of manufacturers around the country.

Finally, the older engines also stamped the actual manufacture date on the engine. This made it extremely easy to spot an old engine at a glance.

Even the engine packaging has a story of its own. Before today's bubble pack, before the cardboard "diamond" packs of the 70s, engines were packaged in heavy blue "mailing tubes" with paper end caps stamped with the type of engine ('D' engines used a larger green tube for a short time). These once could be mailed as is to your house merely by slapping on a mailing label. Of course, they were

usually included in the shipping box with your rocket kit or supplies order. For many of us in those early days, this was the only way to buy model rocket engines. These tubes, although very thick and heavy, could also be used to build rockets. There was even a nose cone specially made for this very purpose. It seems hard to believe in this disposable age we live in, but almost everything could be used back then for some rocketry purpose.

I hope this history lesson has been informative to those who weren't around in the early days of model rocketry. I still miss some of the engines that have been discontinued over time (the A5-2 was particularly useful for boost gliders). However, some have reappeared from different manufacturers. It still is a thrill to find old unused engines at a garage/rummage sale, especially the discontinued types. Keep a sharp eye out and you might find a bit of treasure out there, if only to display on your rocketry shelf.

Art Applewhite Rockets Flying Saucers—A New Twist

By Greg Elder

There are a number of flying saucer model rockets available today. Estes has the all-plastic, ready-to-fly Snitch and Quest has a similar flying saucer with its Area 51 UFO. In addition, Joseph Peklitz has a line of easy to build Styro-F.O. kits. The latest entry in flying UFOs is from Art Applewhite Rockets. These flying saucers include a new twist—they spin during flight.

Art Applewhite Rockets flying saucers are available in four sizes—3 inch for Micro Maxx motors, 6 inch for 18mm motors, 7.25 inch for 24mm motors, and 9 inch also for 24mm motors. This review is based upon the 6 inch and 7.25 inch saucers that I built and flew. Except for the dimensions, the two kits are the same.

The flying saucer kits consist of:

- Detailed, illustrated instructions
- Pre-printed card stock for the saucer body and inner core
- Foam plate for the 6 inch kit (the 7.25 inch kit uses a plastic plate)
- Motor tube
- Motor hook
- Launch lug
- 1/8" Bass wood fin stock material

The flying saucer kit is constructed by first cutting out the main body from the card stock. The body is shaped into an open-ended cone and glued together. Next, the core is cut from the card stock, formed into a hollow cylinder, and glued together. The top of the core consists of a series of small tabs that are folded in, towards the center of the cylinder. (The instructions weren't clear as to whether the tabs should be folded in or out. However, I sent an email to Art who clarified the instructions for me.) Glue is then applied to the tabs and the core is glued to the inside of the cone, centered over the top opening. To complete the saucer body, a hole the size of the core must be cut in the bottom of the plate. A plate cutting guide is included with the kit to facilitate placement of the hole. A sharp knife is needed in order to make a smooth hole in the plate. The plate is then placed over the bottom of the core, such that the outer edge of the plate lines up with the outer edge of the top cone. The instructions recommend using Elmer's Rubber Cement to glue the plate to the edges of the cone. However, I used Tacky Glue which seemed to work quite well for this purpose.

For the motor mount, fins must first be cut from the Bass wood stock. Fin patterns are provided to trace on the fin stock. The three

fins are glued at equal distances around the motor tube. (A tube marking guide is included.) The top of the motor hook is inserted at 1/4" from the top of the motor tube, between two of the fins. A paper reinforcement is glued over the motor hook. The launch lug is glued next to one of the fins. The motor mount is designed to slide easily into the saucer body (inside the core). It should be loose enough such that if you hold the saucer by the body, the motor mount will fall out the bottom.

In order to make the saucer spin during flight, spin tabs are provided on card stock. The tabs are cut out and glued at the bottom of each fin. When dry, the spin tabs should be bent at an angle of no more than 45 degrees. Each spin tab must be bent in the same direction.

As the flying saucer kits I built were pre-printed with an Air Force motif, they required no painting or other finishing. Art does have kits available using plain card stock, if you prefer to add your own color and design to your flying saucer.

I launched the 6 inch saucer with a B6-0 motor. I used a clothes pin on the launch rod to stand-off the rocket about 12 inches above the blast deflector. (You must do this in order to prevent the hot, deflected motor gases from burning the bottom of the saucer.) The saucer boosted nicely for a low flight. You could clearly see it spinning on the way up. At ejection, the motor mount separated from the body and the two returned independently—the light body via featherweight recovery and the motor mount via tumble recovery. The 7.25 inch saucer also had a great, spinning flight with a D12-0 motor. One of the fins on the motor mount broke, however, upon recovery. (Spectators thought the saucers broke when they came apart for recovery. I had to explain that was the way those rockets are supposed to work.)

Art Applewhite Rockets flying saucers are fun to build and fly. They require moderate skill to build, due to the need to properly form the cone and core during construction. The ability to spin during flight, sets these saucers apart from others on the market.

The 6 inch flying saucer costs \$7.50 and the 7.25 inch saucer sells for \$10.00. They may be ordered from:

Art Applewhite Rockets
P.O. Box 877
Converse, TX 78109-0877

Web site: <http://www.artapplewhite.com>

Team America Rocketry Challenge Volunteers Needed

By Mark Bundick, NAR President

I know that many of you have already headed this call for volunteers, but I still need more help from NAR members.

During the school year that is just beginning we are co-sponsoring the Team America Rocketry Challenge, a nation-wide rocket contest for high school teams. The Challenge offers a serious "rocket science" challenge to high school students who are making important life choices about what to study in college. And it offers huge prizes (\$59,000 total) for the top 4 teams, funded by the aerospace industry. We've received endorsements from NASA, the USAF, and just about every education association in the U.S. Full Team America details can be found elsewhere at the NAR website, or visit www.rocketcontest.org.

It is a win-win for everyone involved, but you must be involved to win.

What help do we need?

First and most urgently, we need help in getting the word out to high school teachers. Working with our co-sponsors in the Aerospace Industries Association, we are getting publicity in a wide variety of educator publications. By the end of the year, we will have promoted this NAR project more heavily in print than any project in the history of the NAR. Even with this tremendous exposure, the most effective form of publicity is direct contact. You, the NAR member, can do two, simple, quick things to directly communicate with teachers and students in the field.

Call or visit as many local high schools and teachers as you can. Tell them about the event. Encourage them to enter. Contact the local school district office and ask them to assist you in getting the word out to teachers. Your direct contact will have the maximum impact on a local teacher. You can obtain a summary of the Challenge at:

<http://www.nar.org/TAGuidelines.html>

or the complete handbook at:

<http://www.nar.org/TAHandbook.pdf>

Volunteer to help us build an email directory of teacher contacts in schools.

We need to get the word out to teachers as soon as possible, preferably by mid-September. Working with our Aerospace Industries Association (AIA) partner, we've collected sources for teacher email addresses. We need those sources researched on the Internet for 14 states. Doing each state takes 5 to 15 hours, depending on size. This project is urgent and has an immediate deadline in order to be most effective. If you can volunteer to help, please contact our Team America Manager (and Vice President), Trip Barber at ahbarber@alum.mit.edu, soon!

Secondly, as teams from around the U.S. enter the Team America Challenge, we need local NAR Senior members to do three jobs to assist these high school students.

The senior member can act as a "mentor". Mentors are assistants to the Team America Challenge, advising a team on where to obtain rocket materials, where to fly, how to do basic construction techniques, etc. While you can't assist in the design process itself, you can be a valuable source of information about basic rocketry. Here's your chance to shine as the local rocketry expert and have a ton of fun doing it!

Senior members can volunteer as a "qualification flight observer". Each Team America team has to do an official, NAR-observed "qualification flight" between now and March 9, 2003. The score obtained on the local qualification flight is reported to Team America HQ, and the teams with the best 100 scores nationwide are invited to attend the final head-to-head "flyoff" near Washington, DC, on May 10-11, 2003 to compete for the big prizes.

Members and Sections can offer use of their launch sites and sessions for teams to come out and do practice flights. You and your local section members get a chance to do an excellent outreach that can bring in new members and generate local publicity for your club. You'll also get to see some interesting design work by an highly energized local team. And we all know that seeing and flying new rockets is an excellent way to have more fun at your field!

We have about 70 NAR Senior member mentors and 30 sections signed up already, but we need more. If you or your section can be involved in any or all three of these jobs, please contact Team America Manager Trip Barber at ahbarber@alum.mit.edu.

Finally, there is a potential financial benefit to NAR members who participate in this program. For those members who itemize deductions on their tax returns, your mileage, i.e., the distance you

drive in support of Team America, can be deducted as a charitable contribution to the NAR. You will need to keep a record of the date and miles traveled in conjunction with your Team America work in order to qualify. Your tax software or your tax preparation professional can provide full details about this deduction.

In summary, I need your help in five ways:

1. Call or visit as many local high schools and teachers and make them aware of the Team America Challenge.
2. Volunteer to help us build an email directory of teacher contacts in schools by the middle of September.
3. Sign up to act as a "mentor" to a team or teams.
4. Become an observer for a team's qualification flight.
5. Open your launch site and local launch to a team needing to make practice or qualification flights.

The NAR is involved because Team America is an excellent opportunity for us to formally link the NAR and education in a way that's exciting and fun, both for the students and NAR members involved in the Challenge. Already, Team America has given the NAR opportunities to explore more ways to use rocketry in education. Our contacts with major national educational associations have expanded even at this early stage of the Challenge. We have an unparalleled opportunity to secure a leadership position for the NAR in American technical education with this effort.

To those who have already signed up, my sincere thanks.

To those of you just getting this news, I hope you'll join the fun and excitement of this tremendous educational outreach project by volunteering in one or more of the ways outlined above.

Who knows? Maybe your outreach will result in "your team" making it all the way to the top.

Mark B. Bundick, President

Team America Rocketry Challenge

The National Association of Rocketry (NAR) and the Aerospace Industries Association (AIA) are sponsoring a rocketry design challenge for US high school/junior high school student teams as part of the Centennial of 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 1,500 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 on May 10-11, 2003. The top five 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.

If you are interested in fielding a team, visit the AIA website today to download the entry application so you can register. While you're waiting for your team materials to arrive after you register, or if you want to learn more in order to make a decision about entering, read the Team Guidelines to learn all the rules, or download the full Team Handbook.

The \$160 entry fee entitles you to one 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 also be made available to participating teams.

This is a great opportunity for NAR members to "pay forward" and help encourage the next generation of America's aerospace talent. NAR Sections and members are asked to spread the word about this event, and to provide advice on the hobby of model rocketry and access to launch sites (but no direct help on entry designs!) to teams in their local areas. Read the Team Guidelines to learn more about what teams have to do.

Support for Team America Challenge Teams

The NAR has many ways to support teams that are registered participants in the Challenge. Teams can contact the nearest NAR Section (local club) for advice on general rocket design and launch procedures, building techniques, and launch sites. If there is no Section nearby, they can contact the nearest adult "mentor," a volunteer who has agreed to provide advice to teams that need help. And when it is time to do test flights, or the required "qualification" flight to compete for selection to attend the final "fly off" championships event, teams can fly at one of the many local launches sponsored by those NAR Sections that have specifically volunteered to support the Team America event at their flying site. Or they can contact the nearest NAR launch of any kind on our Launch Windows page and ask if they can come fly.

Space Exploration Quiz

By Warren Layfield

Can you answer these questions related to after Apollo 11, Nov. 1969 - Dec. 1972? The correct answers will appear in the next issue of The COS-Rocketeer. Good luck.

1. What was the destination of Apollo 12?
2. What kind of rocket boosted the majority of Apollo manned Missions towards the moon?
3. Apollo 15 was the first lunar mission to utilize an LRV. What is an LRV?
4. How did LRV's help the astronauts explore the moon?
5. How many Apollo astronauts set foot on the moon?
6. Three astronauts went on more than one lunar mission. Name one of these astronauts.
7. Has any astronaut been on the moon more than once?
8. Beginning with Apollo 15, astronauts returning to Earth no longer had to be quarantined. Why were earlier astronauts quarantined?
9. Did Apollo 13 land on the moon?
10. What was the last manned mission to the moon?

AeroTech Facility Status

July 30, 2002

AeroTech is pleased to provide the following update on the status of its new production facility in Cedar City Utah. As of Friday, July 26th over 80% of the work has been completed, to include installation all interior walls, mezzanine decking and all other

ceiling/roof structures. The shell of the propellant room is complete. Electrical system installation is well underway. Fire suppression and climate control equipment has been staged and is ready for installation. Interior and exterior door installation is over 60% complete should be finished by August 2nd. Work on exterior storage bunkers is moving towards completion.

Joe Burger, AeroTech Production Manager and a core group of experienced AeroTech production employees have moved to Cedar City to assist with installation of production equipment, which is expected to begin this week. Initial raw material requirements have also been staged and are ready for delivery.

Actual propellant production will commence as soon as Cedar City officials issue a certificate of occupancy, which is expected in early to mid-August.

Scheduling of specific AeroTech products is now being finalized. AeroTech dealers will be advised, shortly before propellant production begins, of specific product availability and anticipated delivery dates.

As mentioned in earlier press releases, Bob Ellis will continue to assist with propellant production to help meet existing motor demand.

Photos, which are posted at the AeroTech web site www.aerotech-rocketry.com, show details of the wall system and ceiling/ mezzanine concrete pours. This concrete wall/ceiling system will provide for excellent climate control characteristics during all phases of propellant and motor production.

Any questions regarding this press release may be directed to Mike Martens at mmartens@aerotech-rocketry.com or 702-641-2301.

Astrobee 1500 Kit from Peter Alway

I'm finally ready to announce my new Astrobee 1500 kit to. This is the kit I was hawking at NARAM. It's a 1/19 scale (BT-60, 21 3/4" tall) kit of the Astrobee 1500. Bill Saindon at BMS has done the actual work on this kit, producing the balsa nose cones (one big balsa cone for the BT-60 core, and two small booster cones. He also turns the booster tail plugs that support the nozzles) and the laser-cut parts.

The 40-50 laser-cut parts are the highlight of this kit. Not only are the built-up fins made of 5 laser-cut basswood parts each, but the body tube is laser cut with slots for the fin tabs (through the wall to engine mount) and for the laser-cut scale booster brackets. It was a blast piecing together the parts as they came in the mail from Bill at BMS.

Even the launch lug alignment marks are burned in by Bill's raygun-welding robot (OK, I went for this feature when I was doing the instructions and I couldn't find my drawing of marking with a doorjamb in my stack of backup floppies).

I'm really proud of a lot of cute little building tricks—the raised bands on the boosters are rings of the booster tube (laser-cut, of course) that the modeler snips open to wrap around the booster. Naturally there is a gap, but that points inward and is just wide enough for the tabs on the support brackets. I've always had a hard time getting the cant angle right on paper shroud nozzles, so there is a paper wrap at the base plug of the booster that sets the angle and saves the modeler the effort of filling balsa on the base plug. Oh, and there are neat tabs on the fin ribs so they hold together as you set their angles against guide lines charred into the inside of the fin skin.

I think of this kit as being made of traditional wood and paper materials, but going together more like a plastic model.

This model has a 24 mm D-sized engine mount, though I think it would fly to a more reasonable height on a B or C. I wanted to keep modelers' options open. Especially the 8-tons-of-grey-automotive-primer crowd. The thing should fly like a Big Bertha.

Price is \$30. I was kind of disappointed by how much I had to charge, until I saw an Estes Mercury-Redstone going for \$30 at the US Space and Rocket Center at Huntsville on my way to NARAM. The Astrobee 1500 kit has something like 68 parts at last count.

Here is the page for the kit:

<http://members.aol.com/Satrnpress/astrobee.htm>

Blacksky AltAcc2C New Features for 2002

The Blacksky Corporation, Carlsbad, California has improved the AltAcc altimeter-accelerometer with FOUR NEW features. Scott Bartel of Blacksky states "We listened to AltAcc users and increased the number of functions internally while keeping the external interface as simple to use as the original AltAcc". The new version is called the AltAcc2C and has the following features.

- The AltAcc2C now presents a quick look of the peak barometric altitude above ground level (AGL). After recovery, reset the power and the LED flashes feet in thousands (up to 18 thousand feet) then feet in hundreds. More detailed information regarding your flight is available using the included Flight Analyzer software.
- The AltAcc2C is now programmable for 600, 1200, and 2400 feet barometric main deployment altitudes. Changing the recovery altitude from the 600 foot default altitude requires a PC and two clicks in the Flight Analyzer software.
- The AltAcc2C now has a digital acceleration filter to provide better data with high energy or noisy flights. The filter works by oversampling the acceleration and barometric pressure data and smoothing the output for integration and data storage.
- The AltAcc2C now stores two complete flights. Each 4.25 minute flight is stored in non-volatile memory (the data is good even if the battery fails). Downloading this data requires a PC or PalmOS palm top computer.

Standard AltAcc2C features include:

- Dual acceleration range (25 and 50 g's);
- Mach immune flight and recovery;
- No wiring harness is needed, easiest altimeter to mount;
- Optional parts include the CPR mount system, aluminum housing, beeper, and external arming panel;
- Surface mount components and conformal coated PCB;
- Download cable, Windows and Palm OS software included.

Blacksky also has a program for current Blacksky AltAcc2A or B users for upgrading to the AltAcc2C, call Blacksky or for details at 760 730 3701 or see the web site www.blacksky.com.

Landmark Decision Clears Way for First Commercial Lunar Flight

TransOrbital, Inc. has become the first private company in the history of space flight to win approval from the U.S. government to explore, photograph, and land on the moon. The company expects to launch its Trailblazer Mission from the Baikonur Cosmodrome in Kazakhstan within the next 9-12 months.

The approvals and licensing by the U.S. State Department and the National Oceanographic and Atmospheric Administration (NOAA) position TransOrbital as the only company presently authorized by the U.S. Government to return to the moon. Once launched, the Trailblazer will provide stunning, high-definition (HDTV) video and maps of the lunar surface (at 1 meter resolution), as well as new images of earth-rises over lunar craters. Additionally, the Trailblazer mission should provide the opportunity to view the equipment left behind from past Apollo and Russian landings. The mission will culminate with the delivery of a time capsule containing personal cargo from Earth (such as messages and photographs), and a final "barnstorming" video as the probe impacts the lunar service.

The media collected during the mission will provide TransOrbital with an array of content vital to future scientific and exploratory endeavors, as well as educational and entertainment uses.

"We're not returning to the moon simply to explore. We're returning because there are true opportunities there - true revenue streams," said Dennis Laurie, TransOrbital CEO.

The regulatory approval is a significant hurdle for commercial space enterprises, as they must satisfy a number of design requirements and directives. For TransOrbital, the process took two years to complete.

"TransOrbital has the technology, the desire - and now we have the licensing," said Laurie. "It's a significant moment for our company, and a significant development for all of aerospace. People soon get to experience the moon in ways they never imagined."

About TransOrbital, Inc. (www.transorbital.net)

TransOrbital Inc. is a privately owned supplier of aerospace design and analysis services, spacecraft and commercial space missions. Established in 1998, TransOrbital is the first company of its kind authorized by the U.S. government to photograph, explore, and land on the Lunar surface. The 2001 Trailblazer spacecraft's primary missions are to return HDTV video and other multimedia content from lunar orbit to market as commercial products, as well as the delivery of both personal and commercial cargo to the Moon.

We're going to the Moon-Come join us!



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.)

7 Sep:	Sport Launch, Sky View, 9AM—Canceled
11 Sep:	Business Meeting, 7PM
21 Sep:	Sport Launch, Peyton 9AM—Canceled
28-29 Sep:	High Flight II, Peyton
5 Oct:	Sport Launch, Sky View, 9AM—Canceled
9 Oct:	Business Meeting, 7PM
19 Oct:	Sport Launch, Peyton 9AM—Canceled
2 Nov:	Sport Launch, Sky View, 9AM—Canceled
13 Nov:	Business Meeting, 7PM
16 Nov:	Sport Launch, Peyton, 9AM—Canceled

Threaded Slimline Retainers from Giant Leap Rocketry

Giant Leap Rocketry, Inc. has released the new THREADED Slimline Motor Retention System. Like their existing Slimlines with the ring that snaps inside, the new retainer has a ring that threads inside. According to Ed at Giant Leap Rocketry, the threaded version not only provides the convenience of threaded retention, but it maintains its low profile and low drag by making the ring thread internally, not externally. It is fully compatible with all existing Slimline adapters (regardless of the type of ring).

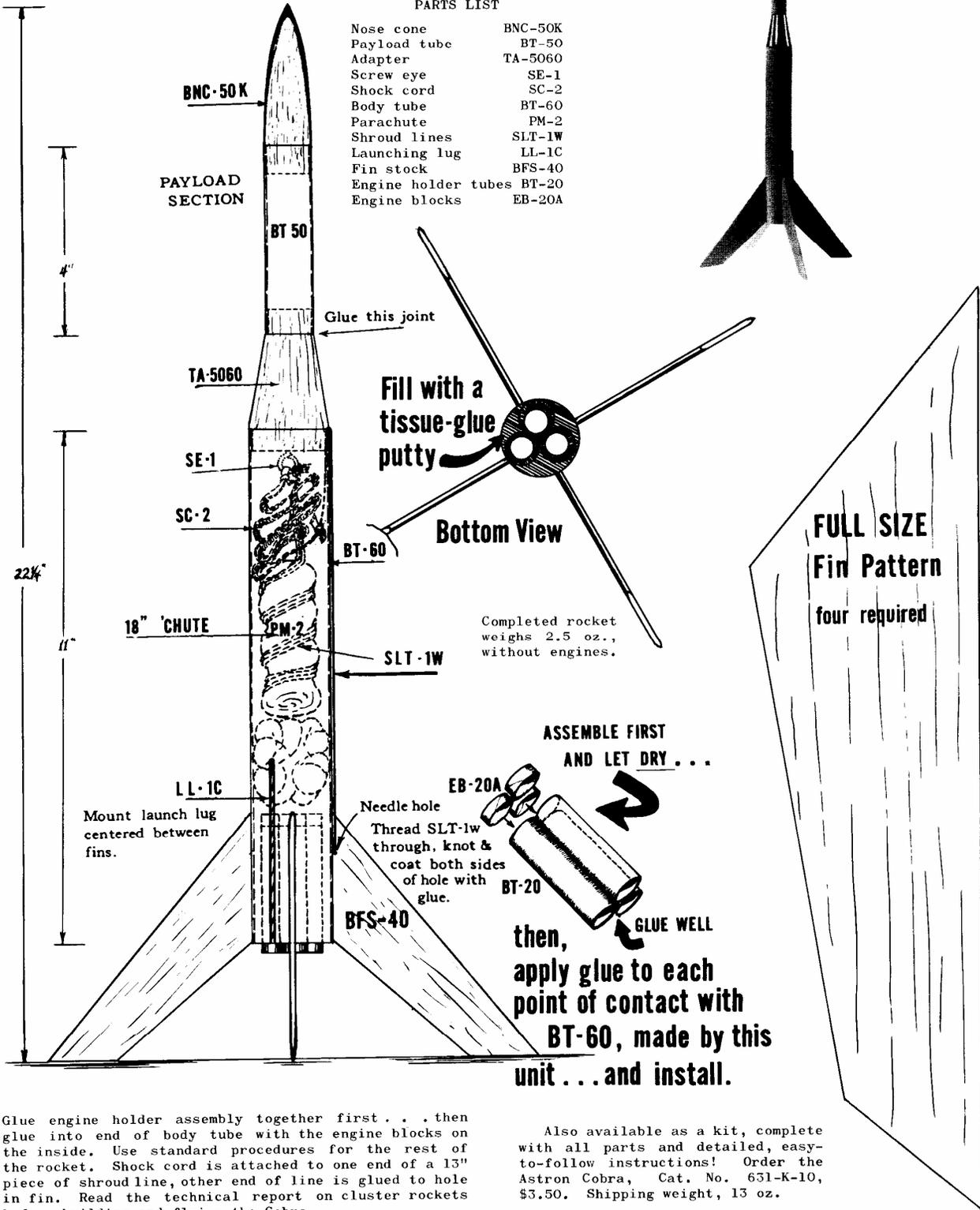
The Threaded Slimline is comprised of three things:

1. A base (or retainer),
2. A threaded ring (or closure), and
3. An extraction tool (not completely necessary, but makes life simpler).

Ed points out that "these three items are included in the Starter Pack. After that, all you need are base units for other rockets of a given motor size. No need to get a threaded ring and tool for every rocket. That keeps the price down." The classic Slimline with the snap-in circle ring will still be available. To see the new threaded Slimline retainer, visit the Giant Leap website:

<http://www.giantleaprocketry.com>

the COBRA



PARTS LIST

Nose cone	BNC-50K
Payload tube	BT-50
Adapter	TA-5060
Screw eye	SE-1
Shock cord	SC-2
Body tube	BT-60
Parachute	PM-2
Shroud lines	SLT-1W
Launching lug	LL-1C
Fin stock	BFS-40
Engine holder tubes	BT-20
Engine blocks	EB-20A

Glue engine holder assembly together first... then glue into end of body tube with the engine blocks on the inside. Use standard procedures for the rest of the rocket. Shock cord is attached to one end of a 13" piece of shroud line, other end of line is glued to hole in fin. Read the technical report on cluster rockets before building and flying the Cobra.

Also available as a kit, complete with all parts and detailed, easy-to-follow instructions! Order the Astron Cobra, Cat. No. 631-K-10, \$3.50. Shipping weight, 13 oz.



Some LDRS photos—from top left to right: a Really Big Daddy, large Honest John, and a large Nike Hecules. First two photos by Charity Ferrel of Photos by Nadine. Third photo by Nadine Kinney.

To the right are photos of Art Applewhite Rockets Flying Saucers. Photo by Greg Elder.



COSROCS
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