SoJARS Altitude!

South Jersey Area Rocketry Society Official Newsletter — NAR Section #593

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Barry Says: Pay It Forward!

Front Page Story

The Robert A. Heinlein "Pay It Forward" Memorial Blood Drive

By Barry Berman

[*Editor's Note: SoJARS Vice President Barry Berman is also the Chairman of the Blood Drive Committee for the non-profit charitable organization The Heinlein Society (www.heinleinsociety.org) - JL*].

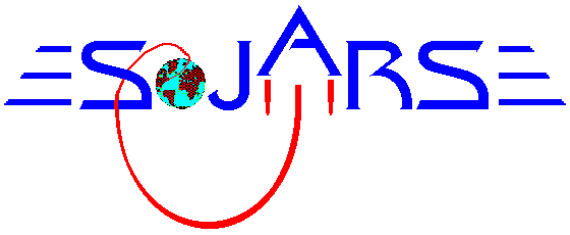
Robert A. Heinlein (USNA, 1929) was known as "The Dean of American Science Fiction Writers," winning the Hugo Award four times. This is the science fiction equivalent to winning four Oscars! He was also the first science fiction writer to be awarded "Grand Master" status. In the early 1970's, Mr. Heinlein wrote a novel in which an organization called "The Rare Blood Club" is a minor part of the story line. He characteristically researched this organization and gave them a plug at the end of the book. Some years later the club came to his aid when he became ill and it was discovered that he himself was a "rare blood." Thereafter he was a staunch supporter of blood donation, attending science fiction conventions and holding blood drives in lieu of an appearance fee, and autographing books to thank donors. He passed away in 1988 at the age of 81.

Recently a group of Mr. Heinlein's admirers have incorporated as non-profit charitable organization, The Heinlein Society (www.heinleinsociety.org). For the past two years I have organized an Internet blood drive to commemorate Mr. Heinlein's birthday, accounting for over 100 units of blood collected in various communities across the US and Canada. I now serve as chairman of the Heinlein Society Blood Drive Committee.

To maintain the tradition of blood drives at worldcons, and to pay forward our debt of gratitude, the Heinlein Society is holding it's Robert A. Heinlein "Pay It Forward" Memorial Blood Drive Saturday, September 1st (Labor Day Weekend) at the Arch Street Methodist Church in Philadelphia. The Church is located 2 blocks west of the Philadelphia Convention Center, where this years' worldcon - The Millennium Philcon - will be held.

Mrs. Virginia Heinlein has autographed 100 copies of her husband's book *I Will Fear No Evil*, which contains the Rare Blood Club reference, to be given to the first 100 donors as our thanks! We also expect various authors who held Mr. Heinlein in high regard to come over to visit us as well.

To assist the Red Cross in estimating what they will need to hold our blood drive, we have set up a page at our website for donors to sign-up in advance. If you've ever considered such a saintly deed as donating blood, PLEASE join us by going to www.heinleinsociety.org and clicking on the "Please Help Us" popup box to register your pledge. Each blood donation can save up to three lives. You'll feel great, too.



President:
Art Treiman
TheTreimans@home.com

Vice-President:
Barry Berman
doc4kidz@aol.com

Treasurer:
John Coles
john.c.coles@lmco.com

Secretary:
Jeff Gage
ggnpoppy@rcn.com

Director of Safety & Range Ops:
Jack Komorowski
Rocketflyer@earthlink.net

Altitude! Editor:
Joe Libby
libbyja@home.com

Print Editor:
Michael Drake
drakester9@aol.com

Public Relations & Web Master:
Patrick Flanagan
pflanagan@flanaganweb.com

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Please visit the frequently updated **SoJARS** website at **http://www.sojars.org** or call the **SoJARS Hotline: 856-424-5905**

Calendar of Events

SoJARS Meetings

Unless otherwise specified, all meetings take place at the Cherry Hill Public Library, 1100 North Kings Highway, Cherry Hill, NJ. (856) 667-0300. Directions are available on our web site. For 2001, all meetings will be held on the 4th Tuesday of the month, 7:00pm - 9:00pm, in Room A.

Tuesday, July 24.
Presentations: TBA

Tuesday, August 28.
Presentations: TBA

SoJARS Launch Dates

Unless otherwise specified, our launch area is at the Gloucester County College. Directions are available on our web site.

Sunday, July 15, 12:00pm to 4pm.
Raindate: none.
Theme: Berman-Treiman Barbie Open (maybe?!)

Sunday, August 19, 12:00pm to 4pm.
Raindate: August 26.
Theme, Funtest, Vendor: TBA

Sunday, September 16, 12:00pm to 4pm.
Raindate: September 23.
Theme, Funtest, Vendor: TBA

EHT PAL Rocketry

Mike Rossbach coordinates rocketry activities for a Police Athletic League (PAL) group in Egg Harbor Township (EHT). Adult participation and help at the launches would be appreciated. Contact Mike if interested: mrossbach@compuserve.com
They generally launch the 2nd Sunday of the month at EHT High School. Launch Dates: July 8, Aug 12, Sept 9, Oct 14, Nov 11, 2001.

GSSS, NAR #439

Launches are usually held on the fourth Saturday of each month, 10am - 3pm: July 28, Aug 25, Sept 29, Oct 27, Nov 24, Dec 29, 2001.
Location: North Branch Park, near Somerville, NJ
GSSS Hotline: (908)-658-9417
Website: http://www.robnee.com/gsss/

Calendar of Events
Continued

MARS, TRA #105
Next Launch: TBA.
Location: Sod Farm, Allentown, NJ.
Website: http://www.njtripoli.org/

METRA, TRA #94
Next Launches: August 4 and 5, in Wawayanda, NY; October 7 at Rickey Farms, Vernon, NJ.
Web: http://www.users.nac.net/jdcluster/Metra.html

Garden State Tripoli, TRA #74
Next Launch: TBA.
Location: Cederville, NJ.
Website: http://www.njtripoli.com/

PARA, NAR #520
Next Launch: July 8, 11:00a - 4:00p.
Location: a farm 9 miles north of Doylestown, PA
Phone: You may call Chuck Arkens (215) 855-5599 or David Stoetzer (215) 412-4348 the night before or the morning of the launch for verification.
Website: http://users.erols.com/dstoetz/para/

Deleware Tripoli, TRA #106
Next Launch: TBA.
Location: Harper Farm, Rhodesdale, DE
Website: http://www.detripoli.org/

Maryland Tripoli, TRA #68
Next Launch: TBA.
Location: Higgs Dairy Farm, Price, MD
Website: http://www.mdtripoli.org/

NARAM - 43
August 4 – 10, 2001, NARAM will be held relatively close to us, in Geneseo, NY! Contests planned include: 1/2A BG, 1/2A FW, A ALT, B SR ALT, C SD, C EL ALT, D HD, SpSc, and R&D. SoJARS members should be there!

Altitude! Deadlines
Submissions for publication are accepted continuously by the editor. The Deadline for the September / October issue will be September 8.

President's Report
By Art Treiman

Well! What a busy couple months both the club and I've had as president of the club. Our May/June issue with the potential loss of the field definitely fits in the category of "When life gives you lemons, make lemonade!" When the status of the GCC field was still up in the air, many of our members helped in the search for a new field. Well, it turns out that the brother of one of our members (who is a science teacher) has been running a student rocket club right nearby. We were unaware of them and they were unaware of us. To make a long story short, our application is working it's way through the school hierarchy and if everything works out we should have access to a field that is about 50% larger than the one at GCC and only about 10 minutes from where the GCC field is now. As soon as we get more details and final approval (keep fingers crossed!) I'll let everyone know.

The other breaking news is the re-introduction of discontinued Estes motors (1/2A6-2 and B6-0) and the introduction of two new motors (24mm E9 and C11 in various delays). These new motors, combined with many new kits and re-releases by Estes can only bode well for the hobby. This marks the first time in recent memory that the number of available motors and good kits by Estes has actually gone up. Let's hope the trend continues, and lets hope SoJARS is a place where all the new kit builders come to fly!

It is in this vein that we should all remember to encourage our hobby among the young. The present rocketry revival will age as our adult members age unless we keep the kids interested.

Well, I'll see you all at the field!

Editorial
By Joe Libby

At the last meeting I suggested we put a story from the membership on the front cover, instead of the usual President's Report and Editorial. Looking at the submissions, several seemed worthy being on the front page. My hope is that this might encourage more people to contribute, vying for front-page honors. I didn't get too many submissions this round, but will be true to my offer.

This month's Front Page Story honor goes to Barry Berman, for his story of "Paying It Forward" by donating blood.

On a less serious note, I saw a great cartoon that I just had to reprint in our newsletter. So, being "Mr. Honest", I emailed the cartoonist himself, Bill Amend, who promptly replied with the thumbs-up and a referral to a nice person at Universal Press Syndicate who gave the official permission to reprint. Pretty cool, huh!

Launch Reports

May 20, 2001

By Joe Libby

Apparently since Barry missed the May launch no one wrote-up the May Launch Report, so here's my version.

It was a great day to be flying, a bit breezy and cool for May, a little overcast, but comfortable. We had a terrific turnout, thanks especially to the Boy Scouts and the DeCrane / DePasquale clan. I'd estimate 40 or more people, with close to 20 fliers and I'll bet near 100 flights.

I'm not even going to mention Pat's "encounter" across Tanyard Road. It's water under the bridge now, anyway.

I'm sorry I don't have details of who flew what, but here's some pictures to tell the story for me…

John Coles recovers his "Harold the Purple Crayon" near its pad. If you don't get it, don't ask me, ask John.

Next are some Scout pictures…

First, a Boy Scout - Rocketeer huddle…

…and then a rack of rockets (some of which are Scouts' I think).

Below, Scouts launch their rockets!

On the next page, someone's beautifully detailed Starship Vega experiences a CATO. I though it was Tom Mitchell's but he told me it wasn't and no one replied to my email asking who's it was…

Next John Gramick loads up another of his finely crafted large model rockets. Behind him others follow a recovering bird.

June 10, 2001

By Barry Berman

June 10, 2001 was another great SoJARS day on the field. After all - it was wonderful just being there. I was very gratified that the "powers that be" at GCC took the time to get the facts straight, and learn about our hobby and especially how safe it is. The June launch took place without a break in schedule, and they deserve our thanks for being fair and reasonable with us.

Although the "GO" decision came at the last minute, we managed to have a great turnout, launching 101 rockets from 24 different flyers. A great way to spend a nice warm and sunny afternoon.

Sydney Treiman started us off with a Corkscrew on a B6-4 (I think. Her dad writes like a doctor!) She also flew her Flash on a B6-4 and her famous fingerpaint-finished "Jamie" on a 1/2A3-4T. Dad Art flew a Quest Tomahawk on a C6-5 for a nice flight although it came down on a reefed chute.

Steve Bastow flew a Fat Boy on a C5-3 and a Skywinder on a C6-3 to win a drag race with Jeff Gage. A.J. Krier flew a couple of Steve's birds: a Gemini DC on a C6-3, a Custom Razor, which had a "squirrelly" flight on a B4-4, and a Corkscrew on a C6-3.

My daughter Katie flew her Alpha on an A8-3, a Gnome on a 1/2A3-2T, and a Mini-Marz Lander on an A10-3T unintentionally proving that MML's come down safely even without parachutes. I flew my Farside-Z - upscale of the Estes Farside - on a D12-0, B6-0, A8-3. It flew great, but stage separation is just too much for these big, wide booster fins and the second stage blew sideways and shredded two of them. The debris fluttered down looking like two big playing cards chasing a "monocopter".

I have since repaired this stage using papered fins and through-the-wall technique (*see article on this technique elsewhere in this newsletter*). The fins are tremendously stronger than before and I hope to demonstrate this at the next launch. I also flew the "Farside-M" - a "mini" version that I built for Chris Taylor, using A10-0T, A10-0T, A10-3T. It flew very well, and as in the old days of aviation, after a successful test flight I can now deliver this bird to it's new owner (not to mention looking forward to building myself another one!).

My last rocket of the day was the Dinoroc-1. This is a design my dino-crazy 6 year old son Zak helped me design and build on Rocksim. It is built

around an Estes BT-60 airframe and got huge altitude on a D12-5. Using my smallest chute AND a large spillhole, I still chased this thing across the GCC parking lot, over a "grassy knoll" and almost to the door of the science building. Next time I'll make Zak come so he can retrieve it.

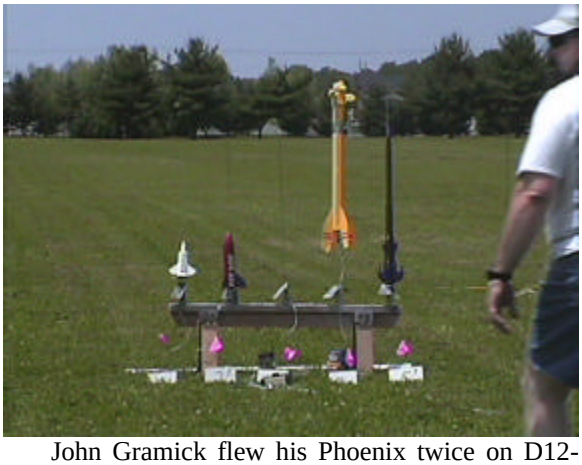
"Toni, Tony, Tone ??" Toni Bonacarti (ladies first!) flew an Estes Quark on an A10-3T, a Big Bertha on a B4-4, an R2D2, and two nice flights of the Fatboy, both on D12-5's. Anthony Bonacarti tied for Laviosier Award honors for the most flights of the day with seven flights. He flew an "Estes Scratch" on a D12-5, a Python on a D12-3, a Wizard on a B6-6, a Launch Pad Phoenix on a D12-5, R2D2 on a B6-4, and two flights of the Commanche: one single stage, and one with all three stages becoming (I believe) the first SoJAR-ian to sucessfully launch and recover this bird at GCC.

Bill Brooks flew a Mean Green Machine ("Estes Generic") on a B6-4 and Chris Brooks flew his Super Speeder (also a Generic) on a B6-4.

John Coles flew his ubiquitous (look it up) Broken Arrow on a 1/2A2-4, and one of my favorites, the Heads Up, on a B6-4. He also flew a cloned Centuri Point on a C5-3, and his Marz Lander clone to a good flight but hard landing on a C5-3. He flew an ECEE boost-glider on a 1/2A3-2T which boosted well and then glided too well (straight!) causing John to wear down a little shoe leather retrieving it.

Paul DeCrane flew a Big Daddy (D12-3), Big Betty (C6-7), a scratch-built Gold Rush (D12-3), his own design Red and White Convertable (D12-5), a Quest "?" (A8-3), and an Estes ARV Condor (A8-3).

Jeff Gage flew an Estes Skywinder on a C6-5, losing a drag race to Steve Bastow. He also flew an AIM-9 Sidewinder (C6-5), his "YDMR" ("yes, 'dat's' my rocket") on a D12-5, and two flights of his Launch Pad Rapier. The first was fine, but the second had a motor CATO. Mark Gage tied with Anthony Bonacarti for the Laviosier Award with seven flights on the day. He flew a Corkscrew (C6-7), a Quark (A3-4T), a two-stage Commanche (C6-0, C6-7), a Goliath (C6-7), a Python (D12-5), and two flights of the "Big Bird(tha)" on D12-5's. This was a Super Big Bertha with a Big Bird figure on the nose. The first flight went well, but the second flight lawn-darted, losing a fin, and causing the venerable avian to seek dental care.



John Gramick flew his Phoenix twice on D12-5's, an Estes V2 on a D12-5, and a Big Daddy on a D12-5.

Joe Libby flew his Crest Patrol on two B4-4's, Big Bertha on a C6-5, an LSX on a C6-3 (two satellites released on streamers), and a Quest Falcon, which experienced a C6-7 CATO.

Dave Liss flew his (modified) Long Shot upper stage twice - once on a D12-5 and once on a D12-7. His Big Daddy flew well on a D12-3, and his Fat Boy on a D12-5.

Tom Mitchell flew his Mark II Estes clone on a 1/2A6-2, an Asteroid Explorer on an A8-3, a scratch-built two-stage "Bigger Bertha" on a B6-0, B6-6. He also flew a scratch-built Spyglass (1/2A3-2T) and two single-stage flights of his Aerobee 150A (C6-5 and B6-4) the second time experiencing a chute malfunction.

Jesse Powell had two flights of his scratch-built Flamer boost-glider on 1/2A3-4T's resulting in one tight- and one wobbly glide. He also flew an Estes Greyhawk (C6-5), which was "fair-caught" for no return yardage by Jeff Gage. Jesse also flew an Intruder (C6-5), and a Super Nova (D12-5). His Estes Skywinder blew out the fincan on takeoff.

Tony Romano flew a Sidewinder on a C6-3 and a scratch-built V2 on a B6-2. Nicholas Romano flew an Estes Fireflash (B6-4), a Quest UFO (C6-0), and an Estes Rampage (B6-4).

Michael Rosenblatt flew an Estes Cyclone (C5-3), an MK109 (C5-3), and an "Orange Thing" (C5-3).

Allan Thomas flew a Sidewinder (C6-7), which "harpooned", a Centuri Gemini (two C6-5's, which came loose from the rocket), and an Estes Heatseeker (B6-4), which blew-out during flight and hard-

landed. Rounding out Allan's less-than-perfect day was an Estes Divebomber on D12-7.

Rich Van Leer showed a lot of "focus" * on the day, flying an Estes Photon Disruptor (A8-3) which needed at least a "B", an AMRAAM (C6-5), a Sidewinder (C6-5) - which I believe won the drag race (since Allan's pronged), and a Banshee (B6-4).

Although there were a few launches afterward, the traditional Silver Comet Drag Race rounded off the day. Participants were: Steve Bastow, Barry Berman, John Coles, John Gramick, Joe Libby, and Art Treiman. No winner since everyone was too busy trying to find his own Comet in our little artificial "Oort cloud"!

The next launch is Sunday July 15th from 11AM to 3PM. Hope to see you there.

(* This is a VERY obscure, Dennis Miller-style reference. A prize for any SoJAR-ian who can correctly explain it.)

Members' Forum

RSO's Soapbox

By Jack Komorowski

Well, we've all heard it before - someone being told that their rocket can't fly by the RSO/LCO. It could be anything that the RSO picks up on, say a rocket with fins too far forward, unaligned fins, poor motor mounting, or any number of reasons that raise a "red flag" in the RSO's mind. Don't get mad at him/her. Find out what the problem is. Most likely they have given you their reason. More to the point, that person is there to protect the interest of ALL, and that includes you, the spectators, landowner, and the other flyers. I do not know of one instance where an RSO didn't want to see a rocket fly, but if they thought it might be un-flight worthy/ unsafe, they grounded it. Period. No power trip, just being safe.

The burden of proof, that a given rocket will fly, is on you, and only you. It is you who must prove to the RSO that this rocket is stable. Tim Van Milligan, in his excellent newsletters, gives ample reasons why even a seemingly stable rocket can go out of control. Cases in point: ever see an Estes Heat-seeker fly well on a B6-4, and then go unstable on a C6-5? I have. I have seen kit models do some weird disco in the sky once they left the launch rod and were free to "do their thing". I also saw a PML Amraam do a crowd seek instead of heading for the wild blue. You're the one dancing to get out of the way, and that is some dance. I've seen perfect "tens" out there: "Yo, good move!" Funny later, but not during.

It all boils down to SAFETY. Yes we have all heard this before, and we'll all hear it again and again. It's what keeps our hobby/sport fun and safe, insurable, with the outstanding record it has to date.

Does any one know how to approach a line of pads or multi-rack? Is there a "correct" way, or a safe way? You bet there is. While I've not seen it in print, there is indeed a more or less "proper "way to approach a line of pads or multi-rack. In our club we have what is aptly described by our President as a "multi launch controller"... something that lets us fly one to six rockets at a time, or at once. This control panel has a cable(s) coming out of the back that leads to the pads / multi-rack, and then breaks down to the leads to each launch position, i.e., six pads, twelve leads with their clips. That's quite a bit of wiring out there. Ever wonder what would happen if bigfoot kicked that cable leading from the LCO's table to the pads? There is a good chance that that day's flying could be over, or a pad was knocked out just when we needed it for a contest. You get the picture, right? The BEST way, and the proper way to approach the pads / rack, is to "go around" the pads, and NOT cross over the cable / leads from the control panel or relay boxes. These panels cost quite a bit of money, and if scratch built, as ours are, labor intensive as well as expensive. Just check out the Pres' description on his hole-in-one-shot in the last newsletter. I couldn't have said it better. In fact, I couldn't have said it at all. And, you gotta admit, it did launch a box of Matzoh.

So, what is the way to go here? Why that's easy. Do what you can to approach the pad / racks from "behind." That is from the side that is opposite the RSO/LCO table or relay boxes with their cables and leads on them. The ground between should be clear so "Murphy and Tanglefoot" don't disrupt a launch because cable / leads were torn out from the control panel or relay box.

'Nuff said. Any comments, opinions, ideas, you can e-mail me.... and for those other opinions, yes I do have a kite, and no, no lake.

Tips

Fin Papering and Tab Technique

By Barry Berman

Our resident rocket scientist, John Coles, lectured on these techniques at an early meeting (early in our existence, that is). Since our group has grown much larger, and many members are not aware of these techniques, I thought a review would be in

order. [*Editor's Note: See also Q & A that follows. A little redundant but these tips bear repeating – JL*]

Bond paper coating fin material:

This simple technique involves covering balsa (or basswood, etc) fin material with bond paper, prior to mounting on the airframe. This provides great strength and a smoother surface for painting.

After you prepare your fin by sanding the leading and trailing edges to an aerodynamic shape (and your root edge flat), fold a suitably sized piece of regular bond paper - such as you'd use in a printer or copier - in half. Unfold it and insert the leading edge of your fin. Take white glue and apply to the upper surface of the fin. I use the straight edge of a balsa scrap as a scraper to smooth a light, even layer of glue over the fin material. You could also use either an old credit card (but I tend to destroy these ASAP) or plastic spatula, or whatever. Make sure the portion of the fin, which fits into the crease of the paper, is well covered in glue. Then fold the paper down, smoothing it as you press. Turn it over and repeat the process on the other side. If you are covering a tabbed fin (see below), cover the tab in glue and paper too. Let it dry. It will look a little soggy for a while, but will dry smooth. When completely dry, use a hobby knife or single edge razor blade to remove excess paper. Some light sanding of the edges may be necessary. You will be impressed by the added strength. Almost NO warping, with very little added weight. It makes for a SOLID fin.

Fin Tabs/Through the Wall (TTW) Construction:

This technique involves making fins that feature a tab extending inward from the root edge (edge which is against the airframe) through a slot cut into the wall of the airframe and attached to the motor mount tube. This creates a fin which is fastened both to the motor tube and to the outside of the airframe, using the airframe itself as a stabilizer, resulting in a fin which is impressively attached to the rocket.

In another article in this newsletter, John discusses a way to design these using Rocksim, but even using pencil and paper it's very simple to do.

Draw your fin design using graph paper (or whatever you're used to using), or print them out on Rocksim in the usual way. Then add the tabs onto the finplan drawing using a straightedge and pencil. This technique requires you use some method of accurately making lines perpendicular to the root edge, but that isn't hard to do. I use a plastic protractor to make two perpendicular lines outward from the root edge.

How big should you make the tabs? I usually make them a standard size and depth (distance "noseward"), which makes centering ring location fairly standard as well. For example, my lower centering ring is usually one inch from the far end of my rocket (more if it's an upper stage, and a stage coupler needs to fit there). This means if my fin is to be flush with the end of the rocket, my tab should start 1 inch + the width of my ring from the trailing edge. I usually make the fin tabs more or less 3/4 the length of the root edge, so if my fin is 5 inches long, my tab is 3.5 to 4 inches (close enough for government work). I make it a nice even number so it's easy to work with. Add the 1-inch plus the width of the lower ring, the 3.5 inches for the tab, and that's where the upper ring goes.

To get the depth of the tab, I subtract the outside diameter (OD) of the inner (motor mount) tube from the OD of the outer (airframe) tube (Use OD, NOT ID, as the tab starts from the outside of the tube!) and since it's a radius, not a diameter, I halve that for the tab depth. Then trace onto balsa or basswood and cut out using hobby knife or single-edge blade. Leave a little extra, and fine-tune by trying one fin and sanding till it fits. It should touch the inner tube and be flush with the outer tube at the same time. Then hold all 3 or 4 fins together and sand in unison until the same size tabs result.

After coating each fin with bond paper (see above), letting them dry, and trimming them, attach each to the airframe with "generous" amounts of epoxy. NOTE: Test fit first and then install the motor mount tube/centering ring assembly first. I use the 5 min stuff, and it works just fine. I can usually do all 3 or 4 fins with one mix. Just glob it on the tab edge and root edge. It'll flow and fill in any cracks/spaces that may be there. Make sure you watch it closely to make sure your fins are on straight. It's easier to get straight fins this way, but not automatic. Applying epoxy fillets is a good idea, too. Another tip: Insert the motor mount tube so that the motor hook is opposite one of the fin slots. This helps you line it up as well as making it easier to insert the motor (fin won't be in the way) later on.

The part of this technique that made me the most apprehensive was making the slots in the airframe. That is, until I tried it for myself. I had heard all sorts of talk about Dremel tools, but found it to be absolutely simple using metal-edge ruler and single edge razor blade.

I use my trusty Estes Fin Marking Guide to make the 3 or 4 fin marks on the bottom of the airframe. I then extend these marks using the edge of the fin-marking guide, but you can also use a doorframe edge or piece of angle iron - whichever you're already comfortable with. I then use the guide to draw circular marks around the tube marking the top and bottom locations of my slots. The bottom of the

slot should be just ABOVE the centering ring, the upper edge should be just BELOW the centering ring. Use the measurements you made earlier. Next, holding the airframe in the same direction, i.e. motor end towards you, draw a second fin line parallel to the first one and 1/8 inch (or whatever diameter finstock you are using) to the left. Move to the next fin line and do the same until they are all done. The result is 3 or 4, 1/8 inch (or whatever)-sized slots marked out on the airframe. Using a metal-edge ruler, trace over these lines with a hobby knife or single-edged razor blade. Make several light cuts and it will practically do itself.

I used this technique on my newly rebuilt Farside-Z 2nd stage, which has bond, paper-coated, TTW fintabs epoxied to the motor tube. I brought it to the June meeting so those present could compare the floppiness of the third stage fins (butt joint, uncoated), with the SOLID second stage fins. I plan to rebuild both booster and sustainer fins using this technique.

I also built the booster stage for my Overthruster in this way (see our Design Library at our website, www.sojars.org, for Rocksim plans). The Overthruster booster stage is a three by 24mm cluster, which features bond paper coated, TTW fins with tabs "tucked-in" between the three motor mount tubes.

Personally, I find this technique easy to do and it provides a very impressive and rewarding result. If you run into me at a meeting or a launch and have questions about this method, please ask, or you can e-mail me at therocketdoc@aol.com.

Editor's Addendum:

Here's a little bonus tip…

For my Junk Mail, in addition to papering and TTW, I drilled a series of small holes, I think 1/8" or smaller, along the fin - fintab line. I did this by inserting the finished fin into the body, penciling a line at the body - fin junction, removing the fin, and then drilling along that line. Then reinserting the fin, having epoxied along the fintab & root edges, PLUS when filleting, the epoxy slips thru the holes like interdigitating fingers! SOLID FIN MOUNT! - JL

Q & A

Fun With Fins

[*Editor's Note: Derived from Email messages between Barry Berman (BB) and John Coles (JC), I've edited them to read as a script… - JL*]

BB: John, I know this is nuts, but I just upscaled the Farside to 2.6 inch size (Estes BT-80). It's 56 inches long and uses a cluster of D12-0's in the booster, and one D12-0 in the kicker (2nd stage) and a D12-5 in the sustainer. The fins on the boosters are almost the size of sheets of loose-leaf paper! This brings up two questions.

JC: Hey Barry. Wow! Yeah, you're right. I think this is nuts! A 2.66x upscale Farside? I'm wondering how are you going to keep the fins from 1) shredding on boost and 2) snapping off on recovery. And will the boosters still tumble safely, or will they need some sort of recovery device?

BB: One: I'm curious as to which version of RockSim you used. I started with your "imported" version of the 1.6X Farside, and upscaled it. When I went into the edit screen for the fins, instead of the graph that I have with 4.0, it made me enter values for each parameter (sweep, span, etc.). This was actually easier, since all I had to do was multiply each value by the factor of 1.625 (1.6 [BT-60] x 1.625 = 2.6 [BT-80]). To make a new design however, this would actually be harder. Does RockSim 5.0 give you a choice as to which method to use, or is there some setting in the 4.0 program (that I'm not aware of), which allows you to go back and forth between these two methods?

JC: When you first enter the design screen for fins (v4.0 *or* v5.0), it asks you if you want a simple trapezoidal layout or free-form fins. The simple trapezoidal is where you input the root and tip chords, semi-span and sweep parameters. The free-form layout is where you "plot" your fins on the grid. I prefer the simple layout for all of my basic fin shapes, and use the free-form only when I need the extra flexibility in design. Unfortunately, once you make your initial choice you can't toggle between the two styles.

BB: Two: Any ideas on material to make these fins out of? Balsa is out since it'll warp and split, but how about basswood. Do you think that would that be strong enough? It still sims to 1300 feet altitude if I use basswood fins.

JC: First of all, it pretty much goes without saying that these fins will have to have TTWTTM (through the wall to the mount) tabs. You'll need the extra strength to help keep them from snapping off constantly.

BB: Yeah, I plan to tab them. The only question is how far to make the tabs go in when the motor mounts are three separate tubes. Since the booster also has three fins, I'll just "tuck them in" between the motor mount tubes. The kicker and sustainer, I'll go right up to the single motor

tube. But what do you do with a four-fin, three-motor cluster rocket?

JC: I agree that three tabs can be "tucked in" between a 3 motor cluster. Much more rigid than gluing the tabs to the surface of the motor tubes. Just be very careful of the alignment between the motor mount and fin slots, that's all. For a 4 fin, 3x18mm motor cluster, I think I would put the three motor tubes inside a length of BT-60, then use 60/xx centering rings into the main body tube. The four fin tabs would then glue to the BT-60. In fact, I'm thinking of re-doing the booster for my 2-stage Harpoon missile this way, since the D12 booster is minimal for that rocket. BTW, don't forget to glue the tabs to the forward and aft centering rings as well (if possible) for even more strength. The other thing is that for fins of that size, you'll be hard-pressed to find anything strong and stiff enough without going to more high-power materials, like aircraft ply or fiberglass. Balsa and basswood are available to a maximum of 6" widths (at least that I've ever seen), so to build up a fin wider than that would require a butt splice. Even if that were strong enough, you'd have to deal with the fins constantly splitting along the grain on recovery. Laminating with paper might help there, but I wouldn't count on it. Aircraft (birch) plywood is readily available in sheets up to 12" wide, and some places even sell 48"x48" half sheets. It's much stronger than balsa or bass, but also much heavier. A possible alternative you might look into is Mach 1 Balsa-ply. It's got the bi-directional strength of plywood, but only weighs about 12 lb/in3 (the same as heavier sheet balsa). The drawbacks here are that it's more expensive (a 2' x 2' x 3/16" sheet runs $26.48) and is generally less flat than aircraft ply. G10 fiberglass sheet is similar in properties to the aircraft ply - it's strong and stiff, but heavy. It also tends to be difficult to cut and shape. I've heard that the sawdust from G10 is very abrasive, and can wear out power tool bearings. A nice, lightweight alternative might be to use fiberglass over balsa. This tends to be messy and time-consuming, but when done right results in strong, lightweight fins.

BB: More trouble (for me) than it's worth, I'm afraid.

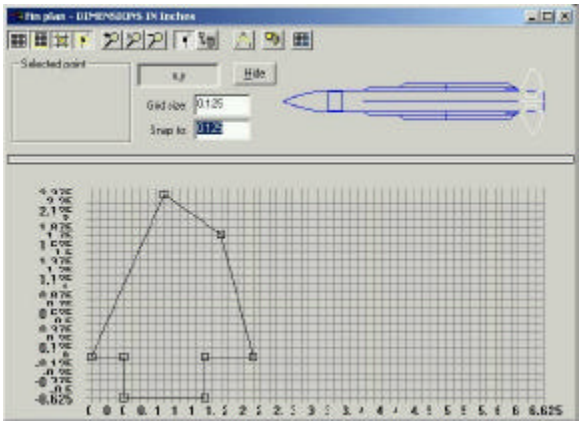
JC: Yeah, I hear you. I've been fascinated with the concept of fiberglassing body tubes and fins, but the work and mess involved is *way* more trouble than it's worth.

BB: I had "BMS Bill" make me motor mount rings out of Balsa ply and I'm very impressed with the material. I've done this myself in a limited way, for bulkheads, but the problem is warping from the water-based adhesives. Maybe do-it-yourself with epoxy??? It looks to me like Balsa-Ply's the way to go. Where's a good supplier around here?

JC: The only source is direct from the manufacturer, Mach-1. Their URL is: http://www.cpinternet.com/~mach1/ I've ordered from them, and like their service, but as I said, the flatness of the balsa ply could be better, and might be problematic for such large fins.

BB: John, I've been to their site. Now I know where you got The Hawaiian Sling from. The only thing is, the amount I'd need would probably run 50 - 60 bucks! If I was going to go that way, I'd look into having BMS Bill cut the fins, but I want to put tabs on them, and RockSim 4.0 doesn't let you do that, and Bill only accepts RockSim data files. Time to think.

JC: Barry, Au contraire! RockSim 4.0 *does* do tabs, if you know how to fake it out! If you design the fins using the "free-form fin" option, there's nothing to stop you from defining points with negative coordinates. There *are* a couple limitations and restrictions, though. First, the (0,0) point cannot be moved. Second, points cannot be defined such that the lines cross each other, even temporarily. So what I've done in the past is to add extra points at the aft end of the fin, then slide them around until they define my tab. Since a picture is worth yada yada, I'm attaching a RockSim file (SM Fins.rkt) that illustrates this point. Just check out the "SM Rear fin with tab" on this.



Screen capture of the free-form fin editor showing how negative coordinates can be used to define fin tabs. This file was used by BMS to laser-cut fins for my Standard Missile sport scale models. The point highlighted in blue is (0,0).

As I've said before, there's no guarantee on the flatness of the Balsa Ply fins, especially in the size you're talking about. However, a little thinned down yellow glue, some copy paper

lamination (both sides at once), and a good coffee table book to press it flat should solve that problem easy. There is one caveat to the addition of tabs to the fins: RockSim has no way of knowing that the tab area is inside the body tube and not contributing to the stability of the model. Therefore any simulations run with tabbed fins will show the rocket as being more stable than in actuality. For the Farside this isn't an issue, but for a marginally stable own-design, it could spell the difference between success and disaster! I got around this issue by building two models in RockSim: a full-up, high-fidelity model without tabs for running simulations, and the simple planform model mentioned above to provide accurate fin templates.

BB: I just add the tabs onto the printed finplan in pen and ink before tracing onto balsa or basswood. This technique requires you use some method of accurately making lines perpendicular to the root edge, but that isn't hard to do. I usually make them a standard size and depth (distance "noseward"), which makes centering ring location fairly standard as well. I then subtract the inside tube OD from the outer tube OD (NOT ID, as the tab starts from the outside of the tube!) and halve that for the tab depth. Fine-tuning is done with sandpaper. Low tech, but it works and apparently circumvents the stability question altogether. For between the tube tabs like on Barbie, or the Overthruster (see our design library), I estimate and fine tune on the paper version first. As per Darren's technique, I use copious (let's maybe say "generous" instead) amounts of epoxy. I used this technique on the new Farside kicker (2nd) stage, which I rebuilt with thicker, bond paper-coated, TTW fintabs epoxied to the motor tube. I also built the booster stage for the Overthruster in this way, featuring TTW fintabs which are "tucked-in" between the three motor mount tubes, as well as bond paper coated. I do believe I could place them on the floor and stand on them! To me the trickiest part of the technique was making the slots in the BT's. That is, until I tried it for myself. I had heard all sorts of talk about Dremel tools, but found it to be absolutely simple using metal-edge ruler and single edge razor blade. I will likely miss the meeting due to an invitation to take part in a jam session (!!!), but both Barbie and the Overthruster will be at the next launch.

So, what we have to do now is have one rack with all of your Marz Landers set up on it, and I'll put all my Farsides on the other one! Too bad they don't make 13mm "-0" motors any more. I'd make a mini version, too.

JC: Yeah. Repairing my 24mm Lander is coming up quickly on my "to do" list. Then I'll be ready. I've also simmed out a true 13mm version of the Mars Lander. It's a lot bigger than the plastic RTF version - maybe I'll build one this winter. BTW, if you look around you can still find A10-0T motors. Ask Mark at M&G Hobbies if he can get any for you. Or try the Allied Hobbies in the Cherry Hill Mall, or Creek Hobbies (Rt. 537 and Ark Rd.) in Mt Laurel.

BB: Thanks for your help, once again.

JC: De nada

FYI

Rocketry Trivia

Submitted by Joe Libby

Here's a little "this day in rocketry history" (or in this case, herstory)...

What significant event occurred on June 16, 1963...

Valentina Tereshkova became the first woman to orbit Earth...

and 20 years later Sally Ride is the first *American* woman in space, June 18, 1983.

SoJARS.org Link Down

Submitted By Art Treiman

The http://www.sojars.org/ link to our website is temporarily down. You can access the SoJARS website via http://odin.prohosting.com/demeris The http://www.sojars.org/ link should be up again soon.

Group Project Update

By Darren Wright (email dwright@d2-tech.com)

Ok, I'll give one last hurrah for the group project, since we are close to half way through the summer, and my season will be getting busy quicker than I realize. I made a request for interest and how much you'd be able to put into the project 2 months ago, and have not gotten one response. This will be last call, and then I'm going to drop the idea. If there are a few of you who would like to do something on the side, fine by me. Just to remind you: The project is going to be a 2 stage, 11.5" to 7.5" airframe, capable of an M to M flight. Initial cost seems to be $1500 or so. Hope to hear from you, if this goes anywhere!

Meeting Minutes

22 May 2001

By Jeff Gage

Attendance

Meeting called to order at 7:05 pm by Vice President Barry Berman. Attending: Art Treiman, Barry Berman, John Coles, Jeff Gage, Pat Flanagan, Russ Mozier, Joe Libby, Steve Bastow, Bruce Canino, John Gramick, Robyn and Lisa Paullin, Steven and Steve Wilson, Bob Ross, Bill and Nancy Rowley, Jesse Powell.

Treasury Report

John reports that the treasury has roughly $1233.00. The club has ordered a mid-power launch pad, the "Wasp" from Yellow Jacket at a cost of $99.00. John Coles in currently building a new controller as well as a high power controller with 2 relay boxes and 100 ft cables. Costs for the new controllers are parts and materials only, as John is constructing these for "fun".

Launch Dates

June 10th (rain 6/17) On hold status at this time.

July 15th (rain 7/22) On hold status. Theme is "The Berman-Trieman "Barbie" Open.

All launches are on temporary hold status at this time, pending further negotiations with GCC for field use. Club leadership may impose motor size restrictions at all future launches. To stay informed of developments, check your Email, the SoJARS website and the Yahoo forum for updates/notices.

Range ops report & Failure debriefing

Barry and Steve report that the recent build and fly program was a huge success. Any one who attended the launch on May 20th can attest to amount of enjoyment and enthusiasm that these scouts exhibited. Well done guys! Barry expects this great program to continue and to become more popular as the word is spread among the various troops.

Newsletter

Once again Joe Libby presented us with a great looking newsletter. That new printer is working great. As always Joe is looking for feature articles that will be moved to the front page! This could be your ten minutes of fame. Everybody has an area of knowledge or expertise; let's hear from you. How about building tips, FYI's, book reviews or plans? Joe would be happy to publish them for you!

Web Update

Pat presented a very detailed report on activity at the SoJARS website. The most active area is the Forum and the most downloads is the monthly newsletter. Pat also reports that a sizeable number of hits are coming from foreign countries, and that people are finding the site with some pretty unusual search criteria. Way to go Pat, excellent job and great web site!

Model of the Month

Two entries this month: Pat Flanagan's "Stomp" rocket and Jesse Powell's futuristically styled "Airplane Thingy". Jesse walked away with top honors and a two-vote lead with his cool design. We gotta see this fly! Thanks guys.

Lecture Calendar

May: Aerial photography by Art Trieman.
June: NARAAM discussion by Chris Taylor
July: "Could be you"

Other business

Club membership has reached 72 members! Wow… who'd have thunk it? A warm, hearty welcome to all our new members.

The "Social " that had been planned for June seems to have turned into the "Fall Social" event. Will advise as plans develop.

There has been discussion of a night launch. Safety issues are the prime concern; so stay tuned for further info.

The 11:00am launch time seems to be agreeable to all flyers. The 4-hour launch window also seems to be "about right." Any feedback?

It has been noted that Tripoli has "decertified" all Kosdon motors. Hmmm.

Launch Fees

The new "Ticket to Fly" launch cards are looking good! They are quite a bargain at $15.00 for 4 launches. (A $5.00 savings!). All club members present agreed that flyers under 18 years would fly free. Same day/single launch fees remain at $5.00. (The "Ticket to Fly" thingy's are looking better!). New Flyers still pay no fee for their first launch.

Business meeting adjourned at 8:20pm.

Lectures

Art Treiman gave an excellent presentation on aerial photography. Art gave us a history of model rockets employing different methods of photography over the past few decades. Art showed us an original Estes CamRoc still in its original packaging. The CamRoc was launched on an Astron Delta and took a single image at apogee. Estes also manufactured a CineRoc, which used an 8mm movie camera. Art explained some of the difficulties he encountered while trying to fit his AstroCam with a Kodak APS camera. Camera types, shutter speeds, and triggering mechanisms were also detailed. A very interesting presentation that was enjoyed by all. Thanks Art!

26 June 2001

By Joe Libby

Again, I didn't get official minutes, so here's my own version, with photos to help…

Attendance

Meeting called to order at 7:00 pm. Attending: Art Treiman, Barry Berman, Joe Libby, Bob Jonas, Tom Mitchell, Russ Mozier, Paul DeCrane, Randy DePasquale, and (apologies) a new member.

Treasury Report

Art improvised. Suffice it to say we have plenty.

Launch Dates

TBA via email.

Range ops report & Failure debriefing

Joe Libby's Falcon had a spectacular CATO on a C6-7 at the June Launch. Entire rocket sent to Estes for analysis.

Newsletter

Joe is looking for feature articles that will be moved to the front page! This could be your ten minutes of fame. Everybody has an area of knowledge or expertise; let's hear from you. How about building tips, FYI's, book reviews or plans? Joe would be happy to publish them for you!

Model of the Month

Tom submitted beautifully crafted large & small versions of a Witch on a flying broom. Barry submitted his mini-Farside scale-down. Joe offered his PS-1 parallel-staged design. This lead right into a mini-presentation on parallel-staged design challenges, limitations, serial vs. clustered motor thrust curves, etc (you shoulda' been there!). [*There was no official vote, but from the groups enthusiasm I think I won, but in all honesty I'd have voted for Tom - JL*]

Lecture Calendar

TBA.

Other business

We may have a new launch field. Keep your ears and email-boxes open.

Lecture

Joe showed photos of launches until we were kicked out of the library at 9:00pm.

Plan Submitted By Tom Mitchell

Not necessarily to Scale. The fin roots should be 4 5/16" and 2 3/8" for the upper and lower fins respectively.

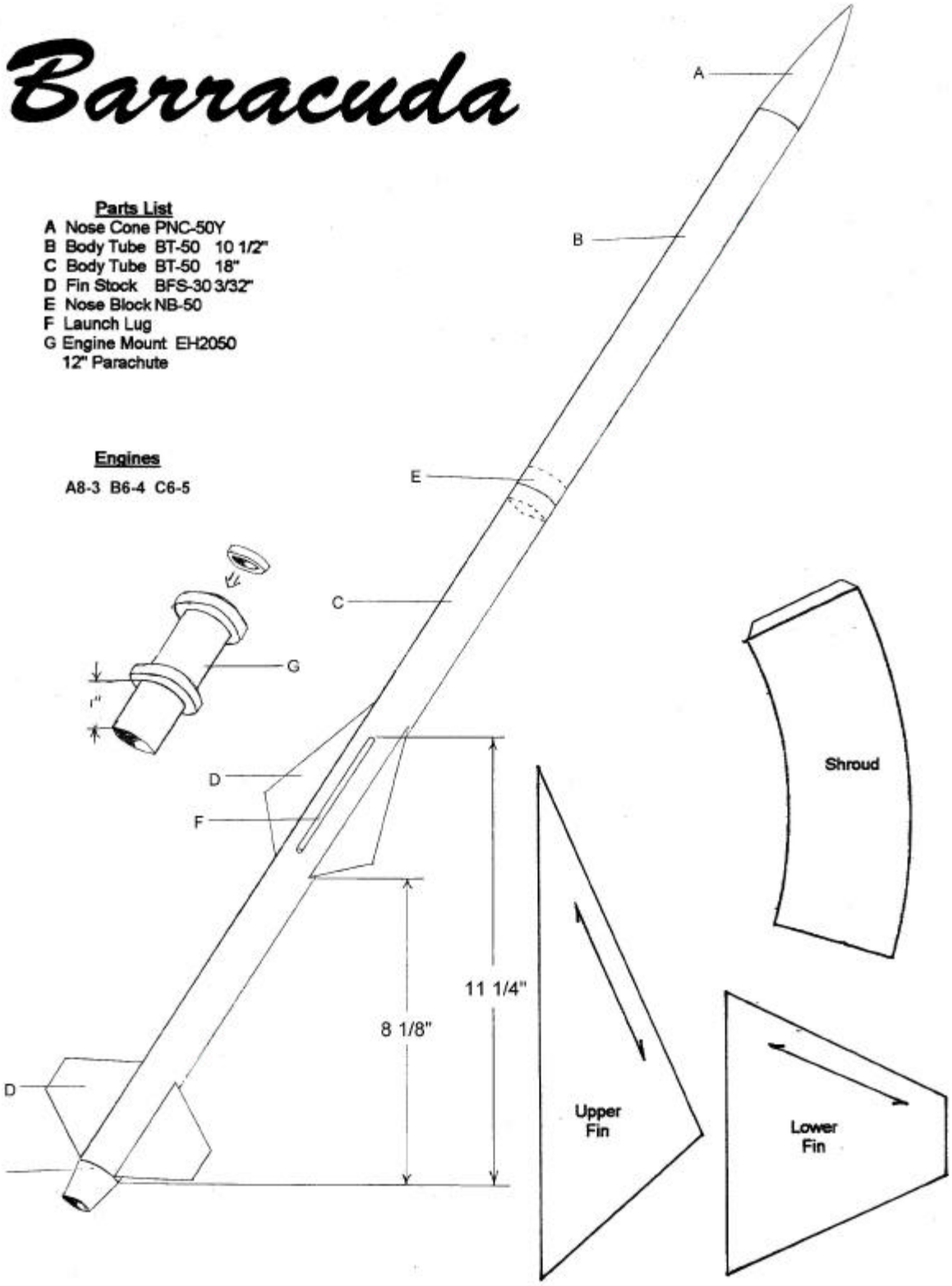


Photo Finish

First a correction: I mistakenly credited the rocket below to John Coles. The following photo is actually of a Jeff Gage rocket taking off, with John Coles looking on it the background.

At right, Pat Flanagan's scratch built large model rocket.