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earthrise

The Canadian Association of Rocketry

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Sept. 11, 2001

Unbelievable Tragedy - Like everyone in the free world, I am saddened, angered and numbed by it, and will be for a long time to come.



Canadian Association of Rocketry

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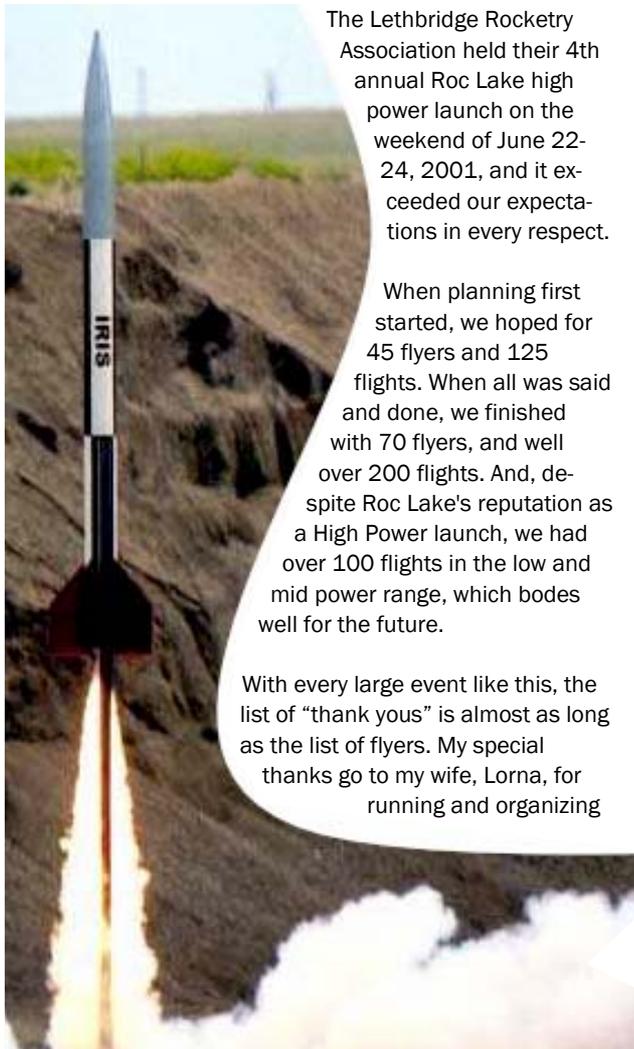
Roc Lake 2001

by Max Baines

The Lethbridge Rocketry Association held their 4th annual Roc Lake high power launch on the weekend of June 22-24, 2001, and it exceeded our expectations in every respect.

When planning first started, we hoped for 45 flyers and 125 flights. When all was said and done, we finished with 70 flyers, and well over 200 flights. And, despite Roc Lake's reputation as a High Power launch, we had over 100 flights in the low and mid power range, which bodes well for the future.

With every large event like this, the list of "thank yous" is almost as long as the list of flyers. My special thanks go to my wife, Lorna, for running and organizing





the food concession, the various members of CRA and ERG who assisted greatly with the range set-up, tear-down and RSO and LCO duties. Our own club is simply too small and does not have the resources to run an event of this magnitude, and the help is greatly appreciated. Thanks also to the vendors, and special guests Scott Bartel from Blacksky, Anthony Cesaroni from Cesaroni Technologies and Barry Lynch from LOC Precision. Lastly, a very special thanks to Grace Nelson for allowing us to use this nearly perfect launch site.

The Norad Pro-Maxx altitude competition proved itself to be very popular. The Norad Pro is basically a LOC Norad kit with a 38mm Motor Mount and an extra 10 inch payload bay. A total of 19 Norads lifted to the skies on H110 power. The "stock" version recorded 3311 feet. Barry Lynch, owner of LOC Precision, announced the winners. Best Paint went to Danny Wong, most creative went to Dave Ross and highest altitude went to Scott West with a flight of over 5000 feet. Honourable mention in both highest altitude and most creative goes to Leon Kemp. The Norad was also the popular choice for Level 1 cert attempts, with 6 being used for certification flights. Congrats to everyone who entered—there were some very creative design changes.

A quick look at motor choices reveals that we Canadians are embracing the new Cesaroni Pro 38's in a very positive way. In total there were 36 H flights with 23 using the H110. A total of 22 I flights lifted off, 14 of which used the Cesaroni motors. And even in the J impulse, normally a 54 mm domain, 15 of the 26 flights utilized either the J300 or J360. These numbers reflect both a good new product, as well as unparalleled growth in our hobby. We have a large number of newer members, and many of these are flying the Pro38 motor.

This growth is further born out by the very high number of certification flights flown. A total of 34 cert flights were attempted, broken down as follows:

Level 1 - 11 attempts, with 8 being successful
Level 2 - 8 attempts, with 8 being successful
Level 3 - 10 attempts, with 9 being successful, plus 1 TRA L2 flight.
Level 4 - 5 attempts, with 2 being successful

We have all attended launches where there were not 34 HPR flights in total, let alone certification flights. Congratulations go to the following people on their successful flights:

On the Cover :
Dale Emery's Iris
Photo: Al McCue

Level 1- Michael Boucher, Dale Madu, Jason Anderson, Shane Weatherill, Andrew Mans, Keith Carlin, Al McCue and Ian

Stephens.

Level 2- Dale Madu, Andrew Longdale, Paul Bernat, Shane Weatherill, Carter Kerr, Joanne Bilodeau, Troy Lester and Kevin Crawford.

Level 3 - Kyle Baines, Geoff Marshall, Scott West, Murray Key, Andrew Longdale, Paul Bernat, Joanne Bilodeau, Garth Illerbrun and Carter Kerr

Level 4 - Dave Buhler and Max Baines

As for sport flights, there were some great ones. I will list a few that caught my eye, and hopefully someone else who wasn't as busy with the launch organization will write an article and fill in the ones I missed.

Dale Emery's Estes Big Daddy on an H-70 was very impressive. Kyle Baines with his very unique Starship Enterprises Centaurus on a H-128 was pretty cool. It amazes me that all those appendages stay on with that much thrust.



Barry Lynch brought out a couple of oldtimers, his LOC Graduator on an H135 and "Old Faithful" on an H125 were both flights with way too much power to weight, but both were great. Eric Weder's Cirrus Dart on an H128 was really moving before it suffered the dreaded shred.

In the I flights, Brad Derzaph's Calamus was an unbelievably fast flight. Close to Mach and over 7000. Durk Wussow always turns out beautifully finished rockets, and his small Endeavor on an I170 was a beautiful flight. Geoff Marshall tempted the rocket gods with a Cirrus Dart on an I170- 7600 feet and an itty bitty rocket.

It was nice to see Garth Illerbrun certify L3. His North Coast Phantom4000 had been sitting in the basement so long even the epoxy looked old, but a great flight! Ralph Muecke loaded his Brusier EXP up nicely, with 2 J-360's and an H110- Cool flight! Brad Derzaph also tempted fate with a

Norad Pro-Max fitted with a J360! Mach 1.2, almost 7000 feet and 39 G's of acceleration- and he got it back again!

Ontario's Gerritt Boerman loves the long burn motors, and he wowed us with his heavily modified Ptero Jr. Plus on first a J135 and then a K185. Great flights!. Eric Weder also went the long burn route, flying his 3 " Quantum Leap as a single stage on a K185- awesome!. Montana's Dale Emery flew his Javelin on a K700, and as seems usual for Dale, another perfect flight to 11,000 ft.

Vancouver's Randall Credico flew his scratch built Crazy Canuck twice, first on a K550 and then an awesome flight on an Aerotech 1050— What a ripping motor that is.

Best shred of the launch goes to Vince Chichak and Dave Ross. The 16" upscale Fatboy lifted off on L1120 power and rose magnificently to 3800 feet. At this point the 2600 odd pounds of pressure exerted by the nose cone proved too much for the Lexan body, which first buckled and then reverted back to its original form— FLAT. Worth the price of admission all by itself. As a side-note, Vince used one of Blacksky's new aluminum AltAcc houses, and while the house showed some abuse, the AltAcc survived without a scratch.

Each of the M flights, and there were a total of 8 M flights, was spectacular. Anthony Cesaroni flew the first M, an Optimal 150 on a M1419. The flight was perfect, and the video downlink was spectacular. Next was my own 6X upscale of the Estes Gemini DC on an M1419. I may be biased, but a great flight, lots of smoke and noise, and what an incredible relief to see all the laundry right at apogee. 55 pounds at liftoff, it recorded 5700 feet and only 4.9 G's of acceleration.

If you haven't seen an M, you fail to realize just how long a burn these really are. Wayne Gallingers full scale Astrobee D on an M1315 typified this. The 48 pound, 13 foot rocket was pretty tiny



How I Became a B.A.R. (Born Again Rocketeer) *by Mark Roberts*

My story gets its start about a year before I actually rediscovered rocketry. I had been thinking for some time about installing a workbench in my basement for small handyman projects. I had no idea at the time that the workbench would become the altar where I would worship so regularly. Not being a very handy handyman, I wanted only a small workbench. One day, I spied an ad for a "junior workbench kit" in a sale flyer from one of the local home improvement stores. The dimensions were 43 cm X 123 cm - perfect, I thought, and headed off to buy my workbench. I assumed that a "junior workbench" would be analogous to "junior hockey;" that is, something for adults who play at an amateur level. Certainly, that describes me when it comes to home repairs.

Well into the construction process, I completed the top and started on the legs. I tacked on the legs and stood the bench up to check if it was level. It was then when I realized that the home improvement store and I had two different meanings of the term "junior" in mind. The bench stood 60 cm high, coming to just above my knees. If I was going to use this thing, I would either have to buy a pair of knee pads or extend the legs. I chose the latter.



Me with "Space Bunny" (Estes Venom), my first rocket as a B.A.R., and one of my favorites.

Some months later in February or March of 1999, my wife and I went to see the movie "October Sky." We had seen the previews earlier and I had thought, "Wow, I have to see this movie - it reminds me of me when I was entering my teens in the early 1960's." In those days, science was in its heyday and my friends and I were into all kinds of fun science projects, including experimenting with amateur and model rocketry. The movie touched me deeply on several levels. It reminded me of growing up and struggling to find myself. Then there was the similarity between the rocketry on the screen and the rocketry that my friends and I had lived. Although we never won a science fair, we did blow my mother's large galvanized metal washing tub about 15 meters into the air where it hung up in the upper branches of a large cottonwood tree. (We had gotten diverted from rocketry into bomb-making for a short time). The town policeman stopped by the next day and

told my father that we would have to get it down before it fell on somebody. Fortunately, it blew down in a wind that night.

My wife, Monique, was amazed by my response to the movie. She said, "Why don't you get back into rocketry? You work too hard and a hobby would do you good. You need to find that little boy in you." At first, I didn't think so but soon I found myself looking for rocketry information in the public library and on the internet. I found a hobby shop in the area that sold model rockets and I bought my first kit, the Estes Venom. I also came across Dwayne Weibe's website at Blaster's Hobby Supplies in Manitoba, where I purchased the Loc Norad kit, my first mid-power rocket ever, after several memorable phone conversations with Dwayne in which he filled me in on the developments in model rocketry over the past 30 years since I was an active rocketeer. The first launch of my Venom ("Space Bunny") was impressive enough but the first flight of the Norad ("Impatient") at a Moncton Area Rocketry Society (MARS) launch really had me hooked. These two rockets (see accompanying pictures) are my favorites because they were the first but they also are neat looking and fly very well. The Norad takes a beating but keeps on flying. It has nearly been eaten by a swamp, having landed right on the edge of the swamp adjacent to the MARS launch site; it was almost a road kill when it landed in front of an oncoming car (the motorist thoughtfully stopped, got out and moved it to the side of the road); and it has nearly become a tree ornament several times after drifting to the ex-



Webmaster Wanted

The Canadian Association of Rocketry (CAR) is looking for a webmaster to maintain the national CAR website. This is a volunteer position, opening 1 April 2002.

Eligible candidates must:

- be 18 years of age or older;
- have a thorough understanding of current Canadian model and high power rocketry regulations, safety codes and guidelines;
- be familiar with registering domain names and domain name contacts;
- have an excellent working knowledge of HTML, Microsoft FrontPage 3.0 or newer, and be able to produce clean, effective web documents;

Roc Lake IV, a personal account.*by Ian Stephens*

Roc Lake IV. I'd been told it was a "not to miss event". But it seemed like I was going to miss it due to a close friend's wedding on Saturday June 23. Andrew Longdale, a fellow CRA member convinced me that I should make it on Sunday at least.

So in order to not miss anything on Sunday, I left my house in Calgary at 4:30am! You know around here it's actually light out at that time! I got Roc Lake around 7:00am or so - and found pretty much everyone still asleep! I thought for sure that everyone would be up launching right 6:00am. Instead they were all partying the night before, I figured. Later I found out that there had been a pretty intense wind-storm that blew through and most people in tents didn't get much sleep. Anyway, eventually by 9:00am or most everyone was up.

The wind that Southern Alberta, especially in the Lethbridge area, is famous for was blowing pretty well, over 30kms in gusts. So we all kind of waited for a while to see what the weather forecast was going to be like. It didn't look good, but a couple of us decided to brave the winds and launch.

I had brought my modified NCR Phantom 4000 kit to fly and maybe to take a run at my Level 1 certification. For the first flight of the day for me and only the second flight for this rocket I decided to be conservative and do another test flight on a G. I call my version of the NCR kit the Phantom 4380, because I replaced the stock 29mm (or so) MMT with a 38mm MMT and replaced the entire recovery harness with a tubular nylon one anchored to an eyebolt in the forward centering ring. I bought a Pro38 G60 casing and reload from Max Baines, loaded her all up, and mounted the rocket on a rail on pad 6 I think.

We then waited a bit for the wind to die down, which it did - to about 20-25kms. We came here to launch I told myself and gave the go ahead to let her rip. Vince Chichak was the LCO and after the Phantom did a little dance off the rail before weathercocking up over the crowd, he suggested that maybe a little more power was needed!

Eventually the died down a little more and more fliers went ahead and launched. Andrew Longdale and Scott West, two fellow CRA members suggested that I should probably try for my Level 1 Certification, since I was here and it would be probably 3 months till another launch attempt could be considered, so.... this was the time. I wrote the L1 test in Wayne Gallinger's trailer, passed with 100%, and paid my \$5. Scott West offered to lend me his Pro38 casing and I gratefully accepted. Wayne and I then found Max Baines again and I now owned an H110 reload - \$37. I built the motor up and Scott helped set the delay with the tool. After installing the motor

and tightening the retention device, I started to pack the recovery harness and the parachute. I finished that and headed off to the RSO table. About half-way, I started asking myself if I tightened the quick-link connecting the recovery harness to the airframe. Better safe than sorry I thought, so I headed back to the car, where I pulled everything out and repacked it all, finding out that, yes, I had in fact tightened it! Oh well.....

By now the wind had died down considerably, but the clouds had moved in and I heard that the base was at about 2300ft or so - pretty well what Rocksim had simulated the apogee to be on the H110 . I got the rocket RSO'ed by Wayne Gallinger and loaded her up on a BlackSky rail, connected up the igniter and checked continuity - all OK. Kriss Homell took a picture of me at the pad and then we headed off to wait for the launch. And waited, it was almost 40 minutes before my turn came up. The delay was waiting for the Cesaroni team to finish setting up their huge carbon fiber rocket for a hybrid M launch. The launch was awesome, but the ejection system failed and the big rocket lawn-darted into ground about 1/2 mile west of us. I tried not take that as an omen.

My turn and after Leon Kemp, the LCO, checked with me to see if I was OK for launch, he did the countdown and off she went! Straight climb and a long burn, she

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One of the most effective methods of increasing the performance of a rocket is to add a boat tail. Essentially, a boat tail changes the rear of a rocket from a large flat surface with high drag, to smaller (although still flat) surface with lower drag.

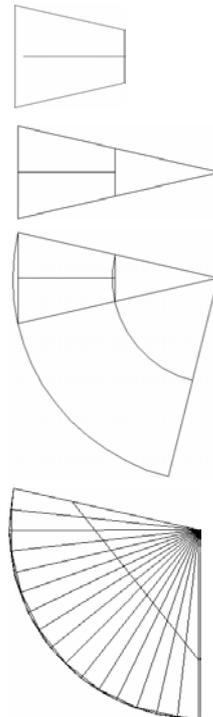
There are several methods of constructing a boat tail, including modifying a nosecone, creation of a simple shroud (which gives most, but not all of the benefits), and fiberglassing over a mould. This article will deal only with building a boat tail by modifying a body tube.

To start out, draw a full-size side view of a transition that includes the desired dimensions. This should allow for the dimension of the base of the rocket (as it exists), the length of the transition, and the desired final dimension (usually just enough to clear motor installation).

Now, extend the two sides to form a point.

Using a compass, draw two arcs, one from each end of the transition. The length of the arcs must equal the circumference of the tubes. This forms the shroud. (Alternatively, you can use a shroud generator like the one in VCP and extend the edge lines to a point to get to this result).

Determine the number of cuts that you want to make in the tube to be modified. There are a couple of factors to be con-



sidered. If you are modifying a body tube, this number should be a multiple of the number of fins. This will allow a cut to be made at each fin, which eliminates having thin strips of body tube beside the fins. On the other hand, if you are using some coupler tube, you may use any number of cuts. There is also a trade-off between smoothness of circumference and final strength. As an example, I have had good success on a 3" tube with 16 cuts.



Use a ruler to locate a point along the length of the triangle that be easily divided by the number of cuts that you are planning to make. Draw a line at this point.



Sub-divide the line you drew in the last step into the number of smaller arcs that you want. Extend lines from the point, to the outer arc.

Cut out the shroud. Then carefully cut from the small end to just short of the outer edge. Straighten the shroud out, and lightly tack the edge on another piece of paper. Draw lines to represent the intact tube prior to modification.



Space the open arc ends evenly. Remember that the spaces at the side of the shroud are each only 1/2 of the space between arc segments. When you are satisfied, tape the arc segments down securely with clear tape (you will need to be able to see through to cut).



Cut out the backing piece of paper, and tape the whole assembly onto the tube to be modified. Remember to account for the material being removed when taping down. Also, if desired, line up the wedges that will be removed with existing fin slots.



This is the single trickiest part of the operation. Take your time, cut slowly, and don't try to cut through in 1 pass. It is actually

