

THE LEADING EDGE

The newsletter for the Northern Illinois Rocketry Association

May / June 2007

NARCON 2007



The Butler girls (Allison, Jessica & Jenna) enjoy the make-it take-it event at NARCON.

This year's NARCON was held from March 9th-11th in Rochester, Minnesota. It was hosted by the Minnesota Amateur Space-modeler Association (MASA). NARCON is NAR's educational convention and one of the big events of the year besides NARAM which is the competition event. If you want to sit it on some interesting sessions and learn about some of the more technical aspects of rocketry then NARCON is the place to be.

This year's event had about a couple dozen sessions ranging from using Powerpoint to design rockets to building tube-finned rockets. Additionally, there were three hands-on workshops on using rocketry in schools, constructing a payload bay, and filling the grain on fins. The NARCON website is still live at www.narcon2007.org and you can visit the site to see the wide range of educational sessions that were offered.

I attended an interesting session presented by Mark "Bunny" Bundick regarding building a fleet of rockets for

competition. Bunny emphasized that it isn't necessary to have to build a few dozen rockets in order to be competitive. If you plan it right, you can build maybe six or seven different rockets that can be used for multiple events. And some of these rockets can be off-the-shelf Estes kits that work surprisingly well form some events. I have the handout from this session if anyone is interested.

I have a personal interest in trying out for the FAI team this summer. This is the U.S. team that competes on an international level. The problem is that the rockets that are built for international competition are very unusual. They are made of very thin layers of fiberglass and epoxy resin and otherwise use extremely lightweight components. NAR is trying to get more people interested in trying out for the team and Chip Barber gave a great presentation on how to build these special rockets. His handout was extremely comprehensive

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President's corner

Bill Ipjian

I for one am glad that the warmer weather and the flying season have returned. Now we can get back out to East Branch and burn some motors. But first I have some reminders on operations at East Branch. These are not all inclusive but just a few items that sometimes get overlooked.

First there is no driving on the field. If you arrive late or leave early, when there is no gate attendant please put the chain back across the gate once you have passed thru the gate. East Branch belongs to the county of DuPage and we are guests. So please keep it clean by picking up after yourself. Place all trash in the barrels provided and take everthing else with you. Pick up used ignitors, wadding, motor casings, paper, and bottles. Leave the field cleaner than we found it!

Make certain to sign in at the RSO table so that you receive your NIRA bucks. While at the RSO table why not volunteer to help set up or take down the equipment, do a hour of gate duty, be LCO for an hour, or (if qualified) to be RSO. Also at the RSO table you will find flight cards. Remember every flight must have a completely filled out flight card. You will give the completed flight card to the LCO when you are on the pad and READY TO LAUNCH.

Please be courteous and respect our fellow club members, quests and their property. We are all there to have an enjoyable day. I wish everyone a great flying season.

April Scout Launch

New NIRA scout liason Joe Charaska did a great job during the April scout launch. Lots of kids got involved and Joe received a nice thank you letter from the Scout leader (see below). Marc Mitchel was on of the NIRA volunteers and here's his recap of the event-

"The wind sure didn't look very inviting. The best evidence of this was that we had the launch site set up by 12:30 but no scouts showed until a little after 1pm. In between, none of the NIRA members present attempted to launch anything of their own; myself included (Bill: I hope I don't have to forfeit my nickname!) and we simply sat around the pad and watched the rods sway!

But, for what looked to be a day of many a lost rocket, turned out to be anything but. I don't have the flight cards but I'd estimate we had around 30 scouts and in the end WE DIDN'T LOSE A



SINGLE ROCKET with most kids flying at least twice and I saw several go up 3 or 4 times. I don't recall any scouts flying anything over a B which I'm sure helped

a lot. Everything was parachute recovery as well: no streamers though we had a good deal of para-wad recoveries which was probably also a good thing.

One of the leader/parents brought several larger models and two of his own rods. He did launch a fairly large LPR on a G and another 3 motor cluster of D's plus two launches of a Big Daddy on a single D. The Big Daddy and cluster I know were retrieved. The G headed east under boost for a fairly long while and I'm
(continued on page 4)

Hi Joe,
I just wanted to personally thank you for a most excellent afternoon yesterday with our cub scouts! THEY LOVED IT!!!! You may see us again, as some of them look like they may want to take this us as a hobby! Again, I couldn't have been more pleased! Thanks for your efforts with our scouts!

Kris

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Building the FlisKITS TRES rocket kit

part two

Jim Basile

Part 1 of this article discussed the procedures used in Steps 1 through 8 outlined in the Tres instructions. Step 8 took a great deal of time and patience to correctly complete it. As discussed in Part 1, I used 180 grit sandpaper wrapped around a grease pencil. I wrapped painter's masking tape around the circumference of the BT-60 tube, approximately 1/8" below the apex of the cut. Figure 7 shown in the previous newsletter is repeated here for clarity. This provided a measure of control to

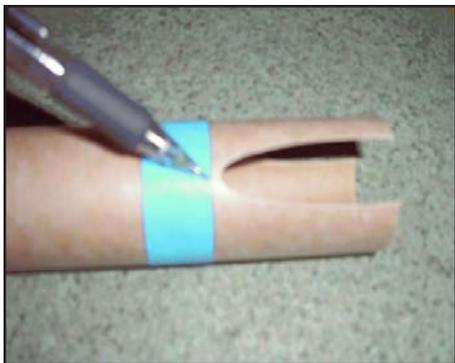


Figure 7.

ensure that equal amounts of material were removed from each engine cutout. In addition to removing material along the length of the cut, you must also bevel the inside edges of the engine



Figure 8.

cutouts. It is important that you take your time when performing this step. If it is done correctly, the engine mount

assembly will fit properly in the tube. There are two things to check to verify that the engine shroud is properly fitting in the cutouts that were made. First, when the shroud is placed in the cutout area it, the edge of the bottom ring should fit flush to the body tube. Second when the shroud is in the position shown in Figure 8, the ends of the tube should not flare out. If they do this is an indication that you have not removed enough material by sanding the engine cutout areas. Remember you must remove equal amounts of material at each of the three cutouts and bevel the inside edges. This will ensure that the shroud is properly lined up and not skewed in the tube. In other words the longitudinal axis of both the body tube and the engine shroud must line up and be coincident with each other. This will ensure that the thrust forces generated by the engines are transmitted equally along the rocket's axis. Once I was satisfied that I had a proper fit between the body tube and the engine shroud, I replaced the 180 grit paper with 400 grit to clean up the cutout areas. As you make the bevel cuts on the inside edges, thin residual material from the tube will form along the outside edges of the cutouts. As you make the bevel cuts you are in effect thinning the tube wall. This was easily removed by the 400 grit sandpaper.

Step 9 provide details to attach the engine shroud to the body tube once a proper fit between the two components has been achieved. Refer to Figure 9, you may notice that once the centering ring is flush with the body tube, the edge of the cutout area may not make full contact along the surface of the engine mount tubes. If a "perfect cut" is achieved, the cutout areas should make contact with the engine tube. As a check I made a second cut on an extra body tube without removing the cutout pattern as described in Part 1. The same results occurred. To remedy the situation I used whit glue to build up the gap between the body tube and the engine



Figure 9.

mount tube. To carry this out successfully, I applied the glue to one gap at a time and allowed it to dry thoroughly. There will be a capillary effect as you apply the glue between the body tube and the engine mount tube. It took three applications to achieve a fillet I was satisfied with. I rolled Step 10 in this process as well. Step 10 of the instructions recommended that the fillets be applied to the body tube engine mount assembly prior to installing the fins. I went with the Flis recommendations and performed Step 10 prior to moving onto Step 11.

Before proceeding to Step 11 in the instruction manual I made a decision to deviate from the Tres instructions. The Tres instructions called for the fin and strake components to be attached to the body tube as two separate pieces. I decided that I would cut the main fins and strakes out as called for in the instructions, make the necessary adjustments, and then glue the main strake to its parent fin. Once assembled, I would then taper the leading and trailing edges of the completed assembly. I recommend this approach in place of individually mounting the fins and strakes to the body tube. This approach was also successfully used by various model builders who shared their experiences on the web site www.rocketreviews.com.

Step 11 provided details to cutout
(continued on next page)



(Scouts from page 2)

not sure if that one ever came back.

We also had very few mishaps. I recall only one separation and that was after one or two previous launches of the same rocket, no kicked motors and only about 4 mis-fires. And nothing but reasonably straight boosts off the rod. The one exception to that last bit was the one and only NIRA flight where Ian provided a little "excitement" with an attempt of his recycle 2 engine cluster/1 engine second stage that turned in a grass snake performance through the launch area coming to rest a foot from the launch control table after only one of the two 1 stage engines lit. It was a heads up flight and the area was clear of scouts so no one was hurt.

My thanks to Joe for a job well done in coordinating the day! My son Jon and I really enjoyed working with the kids and I'd encourage everyone to take the time to volunteer to work at least one scout event as it is a real treat to see how excited these kids get about the whole process. B engines on a 3FNC job won't turn many heads at a NIRA club launch but each of these for the scouts was greeted with a wave of cheers that can make you appreciate the simple excitement that we can easily overlook.

Need flight cards?

It can be busy on the day of a launch, and it can also be windy. Sometimes is hard to find the time to fill out a launch card while dealing with all the chaos on the launch day.

Here's a good idea- why not just

download blank launch cards from the NIRA website, then fill them out in advance? A PDF document of a set of four launch cards is available at <http://nira-rocketry.org/Document/FlightCardSet.pdf>

Pad#	NIRA FLIGHT CARD	Check-in
Owner _____	Model _____	
Engine(s) _____	Recovery _____	
Owner Comments _____		
After Action Report		
<input type="checkbox"/> Good flight	<input type="checkbox"/> Spectacular	<input type="checkbox"/> Separation
<input type="checkbox"/> CATO	<input type="checkbox"/> Lawn Dart	<input type="checkbox"/> Unstable
<input type="checkbox"/> Shread	<input type="checkbox"/> No Deploy	<input type="checkbox"/> Motor Eject
<input type="checkbox"/> Lost	<input type="checkbox"/> Core Sample	<input type="checkbox"/> Other (see comments)
RSO/LCO Comments _____		

Pad#	NIRA FLIGHT CARD	Check-in
Owner _____	Model _____	
Engine(s) _____	Recovery _____	
Owner Comments _____		
After Action Report		
<input type="checkbox"/> Good flight	<input type="checkbox"/> Spectacular	<input type="checkbox"/> Separation
<input type="checkbox"/> CATO	<input type="checkbox"/> Lawn Dart	<input type="checkbox"/> Unstable
<input type="checkbox"/> Shread	<input type="checkbox"/> No Deploy	<input type="checkbox"/> Motor Eject
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<input type="checkbox"/> Lost	<input type="checkbox"/> Core Sample	<input type="checkbox"/> Other (see comments)
RSO/LCO Comments _____		

Building the Tres continued...

(continued from previous page)

Tres instructions called for cutting out all three main fins. For the main fin and the main strake the grain direction runs parallel to the leading edge of these components. Once the fins are cut out, they are grouped and sanded together to form exactly matching fins. The main fin strakes are prepared in the same manner. I made the initial fit up between a fin and strake. For a proper fit up to occur the slopes of the leading edge of the fin and the trailing edge of the strake must match up respectively. If they do not match up, adjustment will be required by sanding or cutting. To ensure proper lineup between these two components, I made a line up jig consisting of a corrugated cardboard surface taped to

my plywood cutting surface. I made two reference lines on this corrugated cardboard surface using a right angle square. The corrugated cardboard in conjunction with wax paper would allow me to use straight pins to maintain the fin strake assembly in alignment to glue and properly dry. I placed a steel straight edge along the horizontal line and clamped it in place. Once this was done, I positioned the main fin and main strake against the steel edge. I believe that this step produces a reasonable means to check for proper fit up between the leading edge of the main fin and the trailing edge of the strake and at the same time ensure that the root edges of the two components are plumb to a straight edge.

I allowed the fin strake assembly to dry overnight. Once dried, I tapered the leading and trailing edges. Care and thought must be exercised when tapering the leading edge at the point where the strake surface transitions to the leading edge of the main fin. I had a difficult time visualizing this transition. Once the two components were glued I was able to make a reasonable transition between the two different geometries. I used thinned out Fill N'Finish wood fillerprepare for painting. This mixture was then applied to the fin strake assembly, allowed to dry then sanded smooth.

This article will continue in subsequent issues of The Leading Edge.

Model of the month winners for April 2007

Tony Lentini blazed his way to victory in Adult with his scratch built, Vostok-inspired Flair. This rocket took some pretty creative cutting of the tube sections.

Angel Cooper grabbed Junior honors with her nicely finished Pulsar.

In Youth the shootout was between the Mitchells and the Butlers again, with Jenna Butler winning out using her Pink Flower. Jenna drew the decorative designs on paper while her Dad then helped covert them to decals.



(l to r) Jenna Butler and her "Pink Flower" (modifield Semroc April Dancer), and Tony Lentini's scratch built Flair.

Model of the month winners for May 2007

Chris Cantine won Adult using his scratch built Thrustwinkle. Chris thought it would be fun to do something easy and humorous, and he hit the mark on both counts.

There were no Junior or Youth entries in May.



(l to r) Angel Cooper (Junior) and her Pulsar and Chris Canite's scratch build Thrustwinkle.



Here are just some of the additional rockets entered in the Model of the Month competition. If you need to be inspired to build something then show up at the next meeting and see what everyone else is doing.

Marty “pop-pod” gives presentation on... what else...



If you missed the April meeting then you missed a really informative presentation by Marty Schrader on boost gliders- or, more specifically, rear engine pop-pod boost gliders. Marty

had planned on giving this presentation at NIRA-con, but we had run out of time.

Marty mentions that he would like to write a book on boost gliders, and there’s no doubt he would have enough content. He emphasized that most boost gliders aren’t really required to produce much lift, and instead, simply fall out of the sky. That’s an oversimplification of what he said, but the main point is that you don’t have to worry too much about the aerodynamics of the wing sections. The wing area is more important, and it isn’t necessary to even create an airfoil on the wings.



check out Marty’s designs at our monthly launches. He usually brings a number of them with him.

Marty has been designing boost gliders for so long that he has a good feel for when they will be aerodynamically stable just by looking at the design. He suggests getting any new designs checked out by someone experienced as himself if you decide to build your own.

Boost gliders can be inexpensively built out of foam. Marty will often use foam from left over packing material from the store- such as what you might find in the butcher’s section.

Trimming a boost glider can be a little tricky and the glider will often perform differently in flight than when it was tested.

Marty can attest to that :).

Marty has an amazing collection of different designs and he’ll usually bring a number of them for display purposes when NIRA has a special event.

You can also

check out Marty’s designs at our monthly launches. He usually brings a number of them with him.

weekend. I think they gave out well more than 100 door prizes and most everyone won at least one prize, if not two. The grand prize was the winner’s choice of any kit from Sheri’s Hot Rockets and worth over \$500! The door prizes were an excellent idea.

I had attended NARCON in 2005 and 2006 when hosted by the WOOSH folks in southern Wisconsin. I have to admit that the drive was much shorter than to Minnesota and they had more educational sessions, and I generally found it more interesting. WOOSH had gotten Vern Estes and Lee Piester as keynote speakers during the last few years and I



felt that was a big draw. MASA got a few local Minnesota folks who were in the aerospace industry, and while interesting, weren’t as good as Vern and Lee.

NARCON tends to stay at the same location for at least a few years. So I’m hoping the MASA guys can get some really standout speakers from the model rocketry field for next year. And hopefully expand the number of sessions that are offered. Rochester is somewhat of a small town and is pretty much a ghost town on the weekends. We were lucky enough to stay offsite at a Ramada Inn so my wife and kids could use the swimming pool all weekend while Dad was off learning about rockets. There was one session for the kids, but other than that, not much else for them to do at NARCON. It makes for a nice weekend for the family as I otherwise probably wouldn’t have considered making such a long trip by myself.

(NARCON from page 1)

and formed the basis for a rather lengthy article in the recent issue of sport rocketry.

The vendor hall is always the place to be, and a great place to empty your wallet. Some of the vendors such as Fliskits and Semroc introduced new rockets at NARCON. The attendees bought some of the very first kits right off the assembly line. Semroc had a

drawing and I was lucky enough to win a Saturn 1B kit. NARCON is the place to be if you want to meet many of the smaller vendors in person.

It’s apparently a big hassle to get a permit to do raffles in Minnesota, so the MASA folks decided to do a lot of door prizes instead. They basically put everyone’s name into a box multiple times and awarded rocketry gifts all