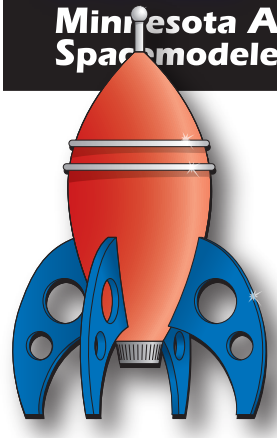
2006 NAR Medium Section of the Year
2007 NAR Medium Section of the Year

MASA Planet

Minnesota Amateur Spacemodeler Association

Volume 11, Issue 2
March - April 2008



MASA
Established January 1998
NAR Section 576

Planet Table of Contents

Important Notes About the Upcoming MASA Launch in March

MASA March Launch: "TARC Open"
Saturday, March 29 (one week later than normal)
10:00 am to 3:00 pm
Location: Apple Valley High School, 14450 Hayes Rd, Apple Valley. GPS: 44.745ºN, 93.230ºW
The annual March launch at AVHS is both a regular MASA launch and an opportunity for local TARC teams to attempt their qualification flights.
There will be a couple "community" launch pads for people to use, or you may bring your own pad & controller. This is a model rocket launch - maximum liftoff weight of one pound and max motor size of "E". Multi-stage and cluster rockets at the RSO's discretion.
The field may be muddy. Please do not drive on the field or the paths without staff permission. The field is approximately 800' x 1000'.

NARCON 2008
looking back / PAYING FORWARD

MASA Hosts NARCON 2008 in Rochester

MASA hosted the 2008 National Association of Rocketry's Annual Convention, known as NARCON 2008 on March 14-16 at the Kahler Grand Hotel in Rochester.

NARCON 2008 was a huge success, as we celebrated the first fifty years of the NAR. Attendees and presenters came from all over the country to join us in the three day long celebration.

Twenty five presentations were given on various rocketry subjects, two make it/take it sessions were held, and a sport launch was hosted by TSM. Forums included a vendor's forum, an educator's forum and an old rocketeer's forum. NAR President Mark Bundick held his Bunny's Town Hall Meeting. Special guests Vern and Gleda Estes shared a lot of never before seen or heard history about the beginnings of Estes Industries. Many fabulous door prizes were handed out all weekend, and Vendor Hall proved to be a popular place to spend time and money with the hobby's top vendors.

For complete coverage of NARCON 2008, see the Special Edition NARCON 2008 MASA Planet coming out soon.

Gleda and Vern Estes with MASA VP and NARCON 2008 Event Director Carol Marple
Photo by Alan Estenson

MASA Planet

MASA Celebrates It's Tenth Year!

It all started with a simple idea of getting a few people together that were interested in an obscure hobby called model rocketry. After hanging a flier on the bulletin board of a local hobby store, MASA's founders Russ Durkee, Mark Thell and Damien Kostron had no idea that it would grow to this.

MASA became an official NAR section in early 1998 and in less than 10 years, MASA has earned it's ranks among NAR sections as the 2006 and 2007 Medium Section of the Year as well as the proud hosts of NARCON 2007 and NARCON 2008.

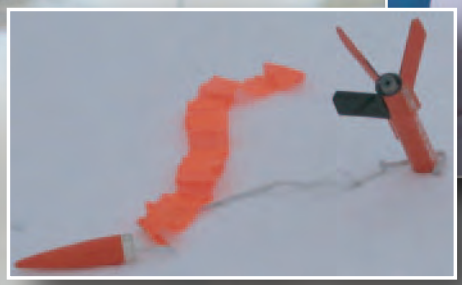
MASA's first Level I HPR certification was awarded to Ted Cochran in June of 1998. Since then, MASA has awarded nearly 20 successful HPR certification flights. MASA was featured in the March/April 1999 issue of Sport Rocketry magazine as it described the club's first year. On January 26, 2008, MASA held it's commemorative 10th Anniversary launch, almost 10 years to the day from it's first club launch in 1998.

Happy Birthday, MASA

MASA's Commemorative 10th Anniversary Launch January 2008

Photos by Alan Estenson

Russ Durkee's Custom Serval flew at the very first MASA launch and again ten years later!



See Page 10 for more pictures of MASA's Commemorative 10th Anniversary Launch

Tech Report

Baffles - Part 1 Background,Executioner Retro-fit and Repair

By Ken Jarosch


Labyrinth Baffle Under Construction
Photo by Ken Jarosch

BACKGROUND:

The plan was to build 3 HPR rockets: 4", 5.5" and 7.5" diameter models. They would be built modular so as to fit in my car, and I used Stu Barrett's zipper-less fin can ideas as a start. Stu mention that he would include a baffle if the motor ejection charge was close to the end of the coupler/bulkhead. He suggested putting the baffle in the coupler. Ref: "NAR Member Guidebook", Volume #6, 2007, page 19. I was intrigued by this self contained idea.

Years ago NAR SPR had an article for baffles in model rockets. They simply used 3 centering rings on the motor tube with the end of the motor tube blocked off. The baffle effect was between the two upper centering rings forming a chamber with holes punched in the side of the motor tube. The forward centering ring had holes drilled into it allowing the gas into the rocket body. This resulted in two right angle changes in the gas flow. First out of the motor tube into the chamber and then from the chamber out the top centering ring.

AeroTech uses a right angle deflector at the end of their motor tubes and steel mesh in the motor tube to cool the gases. LOC Precision used to sell Modular Baffle units to install or retro-fit their 24mm to 54mm motor tubes. Actually it was just one unit with various adapters. I still have the 24mm/29mm unit. It consists of a 2-1/2" baffle tube, metal heat retaining element and a retaining ring. This unit fits inside the 29mm tubes and over the 24mm tube ends. The larger motor tubes used adapters.

Getting back to the self contained baffle brought me to Sunward Aerospace (www.sunward1.com) which sells baffles for BT50 through BT80 tubes. These are all constructed in a coupler section for model rockets. All the baffles use two end bulkheads to form the enclosed chamber with the coupler. The exception is the BT50 baffle which uses 3 alternate 2/3 plates. The BT55 to BT80 baffles use a special drilling idea in all their bulkheads. The first bulkhead has 8 holes drilled along the outside edge on an even spacing. The other bulkhead has 7 holes in it. There is one hole drilled in the center of that bulkhead with the other 6 holes placed evenly surrounding the center hole. This offset is the baffle function, which provides for a self contained straight through design. These baffles could be use to retro-fit a rocket or during the construction stage as a coupler/baffle between body tubes.

Semroc (www.semroc.com) also makes baffle kits, but the one most interesting is included in their New 2007 SLS ARCAS kit. This kit is 45" x 2.25", weighs 8.7+ oz. and flies on D to H128. Looks like a great kit. It uses two bulkheads with wood sticks as spacers. Each bulkhead has one offset hole for a short motor tube piece like a two cluster motor mount but with only one hole in each bulkhead. One short motor tube is glued to each bulkhead. These motor tubes form a 3 chamber parallel labyrinth with the body tube. The gases enter through the right short motor tube into the baffle chamber space (between the bulkheads and body tube) and then out the left short motor tube into the recovery area. The hot gases complete two 180° turns before entering the parachute area. What a neat idea.

I really liked the idea of a 3 chamber labyrinth for a baffle. But I came up the idea of instead of the parallel system I would use a stand alone concentric 3 chamber labyrinth, using standard parts of a coupler, bulkhead, a centering ring, a small piece of motor tube and another tube for the middle chamber. Add the ¼" Eye bolt and you have the zipper-less bulkhead. In the design for the (70" x 4") Spirit of America - 2008 (See Part 2) I used the 3.90" x 6" (TC-3.90) coupler for the outer chamber. A section of 38mm motor tube was cut 1" shorter than the coupler. This formed the inner chamber. The middle chamber was formed by cutting 1" off a 2.56" x 6" (TC-2.56) coupler leaving the middle tube 5" long. So to build the baffle you epoxy the 5" motor tube to the centering ring for the base. The 5" long 2.56" coupler is epoxied to the center of the bulkhead with the eyebolt. This forward bulkhead has twelve 1/4" holes drilled along the perimeter. They are drilled half way between the coupler edge and the middle tube edge. The CTR/motor tube is epoxied to the bottom of the coupler and the bulkhead/middle tube is epoxied about a

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Labyrinth Baffle Under Construction
Photo by Ken Jarosch

Baffles - Part 1

Continued from Previous Page

1/16" inside the top of the coupler edge rather than flush. You now have a concentric 3 chamber stand alone labyrinth baffle. The gases come up the short motor tube through the centering ring and into the middle chamber coupler. The gas flows back down the middle tube and into the outside coupler and then out the 12 holes in the bulkhead into the recovery section.

One thing is common to all these stand alone baffles: they are in a space above the end of the rocket motor tube. That is, the gases leave the motor tube to a space in the body tube before entering the baffle unit. This means the volume goes from a confined motor tube to the larger area of the body before reducing to the elements of the baffle unit. I didn't think this is an ideal setup. (See Part 2 for Design Change)

EXECUTIONER RETRO-FIT & REPAIR:

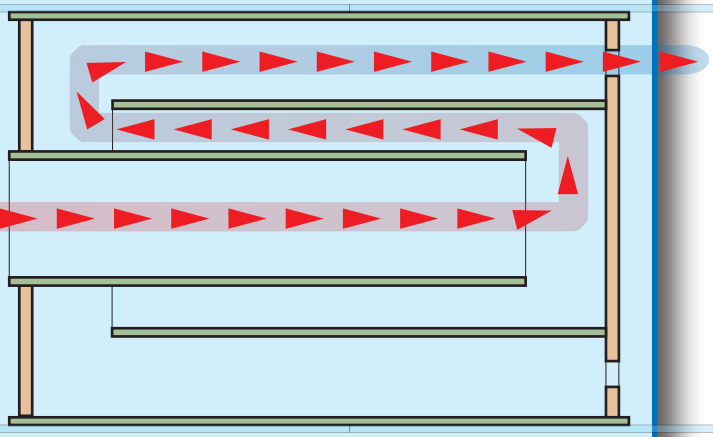
But before I could install the 4" x 6" baffle/zipper-less bulkhead into the Spirit Of America 2008, I crashed my Executioner due to failed ejection charge. The rocket was destroyed down to the coupler. The fin can was OK so I cleaned it up at the coupler, planning to simply add another tube and get another nose cone. But as I was working on the HPR models, I decided to retro-fit the damaged Executioner with a zipper-less design using a baffle. Since the rocket already had a coupler in place, I needed to add a body section to the coupler so I could install a baffle/bulkhead unit. I epoxied a 5" piece of LOC 10" x 2.56" payload section to the coupler of the fin can. Next I made a simple baffle unit using a 6" BMS-2.56 coupler with BMS bulkheads at both ends. I used the Sunward hole design of 8 holes along the perimeter of one bulkhead and the 7 hole cluster at the other bulkhead. I found the BMS bulkheads to be too flimsy for what I wanted so I reinforced the top bulkhead with two plywood pieces to form a cross. One piece was epoxied on the inside and one was on the outside of the top bulkhead. I used a #110 screw eye through these pieces for the zipper-less design. This stand alone straight through baffle/bulkhead was then epoxied into the 5" LOC tube extension of the Executioner.

With the Executioner's fin can done I needed to build the recovery section. I built a 15" recovery section from a second LOC 10" payload section coupled the leftover 5" section. I bought a new LOC PNC-2.56 for the nose cone, and epoxied a ¼" eye bolt, fender washer and nut to the base of the nose cone for the quick link attachment. With a 25' piece of 3/8" elastic shock cord, two 3/16" quick links and a 22" AeroTech chute, the repair was done. (Note: chute was attached at the 1/3L from the fin can.) But upon weighing the total rocket it was too heavy for the 24mm motors to be used. So I broke into another Executioner kit and borrowed the lighter top tube and nose cone. I also changed the recovery system to only use 18' of 1/4" elastic shock cord, one 1/8" quick link and the 24" Top Flight chute. The other end of the 1/4" shock cord was just tied to the lighter Estes nose cone which is held to the recovery tube by 4 small screws and washers. This brought the weight down to where an E28 or F24 would work great.

The much heavier LOC 15" recovery section, LOC PNC-2.56 and recovery system were to be saved for a 29mm Executioner. The nice part of this design is the ability to interchange parts. (See Part 2 in a future issue)

Ken Jarosch
NAR 56442 SR, TRA 10290

Baffles got you Baffled?



This figure explains how Ken's Labyrinth Baffle System works.

The hot ejection gases from the engine flow through the inside tube. Then the gases make a 180° turn and flow backwards through the middle tube. Another 180° turn and the gases flow through the outer tube and out through the holes in the forward bulkhead. All this twisting and turning cools the gases to a point where recovery wadding usually isn't needed.

2008 Launch Windows (March - July)

Subject to Change - Check MASA Website for updates

All MASA Launches are "Misfire Alley" (bring your own launch pad and controller)

MASA March Launch: "TARC Open"
Saturday, March 29 (one week later than normal)
10:00 am to 3:00 pm
Location: Apple Valley High School, 14450 Hayes Rd, Apple Valley. GPS: 44.745ºN, 93.230ºW

MASA April Launch
Saturday, April 26 - 9:00 am to 4:00 pm
Location: TBD (hopefully Nowthen)

National Sport Launch (NSL)
www.nsl2008.org
May 24 - May 26
Orangeburg, South Carolina

NAR NATIONAL EVENT

MASA May Launch *
Saturday, May 31 (one week later than normal)
9:00 am to 4:00 pm
Location: Nowthen

MASA June Launch *
Saturday, June 28 - 9:00 am to 4:00 pm
Location: Nowthen
Themes: Boost Gliders

MASA Summer Picnic
Saturday, July 19 - 2:00 pm to 8:00 pm
Location: Elk River VFW

MASA July Launch *
Saturday, July 26 - 9:00 am to 4:00 pm
Location: Nowthen
Themes: Clusters

NARAM 50
www.narhams.org/naram50/
July 26 - August 1
The Plains, Virginia

NAR NATIONAL EVENT

* FAA waiver approved to 5500' MSL (about 4500' AGL)

Where are the MASA launch sites?

See www.masa-rocketry.org for details and directions

Nowthen
Fricke Sod Farm
Southwest corner of Tiger St NW and 211th Ave NW - Nowthen

Elk River - Rogers VFW 5518
VFW Memorial Sports Complex
7350 Quaday Ave - Elk River

SEE PAGE 1 FOR IMPORTANT NOTES ABOUT THIS LAUNCH

MASA Planet

2008 Meeting Schedule (April - September)

Subject to Change - Check MASA Website for updates

Unless otherwise specified, all meetings shall be held at the Science Museum of Minnesota in St. Paul, Classrooms 11 & 12

MASA April Meeting
Thursday, April 10 (one week later than normal)
7:00 pm to 9:00 pm
Topic: RSO/LCO Training (let's ALL prepare for a SAFE flying season!)

MASA May Meeting
Thursday, May 1 - 7:00 pm to 9:00 pm
Topic: Hybrids

MASA June Meeting
Thursday, June 5 - 7:00 pm to 9:00 pm
Topic: Kitbash

MASA July Meeting
See Summer Picnic in the 2008 Launch Window

MASA August Meeting
Thursday, August 7 - 7:00 pm to 9:00 pm
Topic: NARAM 50 in review

MASA September Meeting
Thursday, Septtember 4 - 7:00 pm to 9:00 pm
LOCATION FOR SEPTEMBER MEETING IS TBD

Remember to check out
www.masa-rocketry.org
for the latest Launch Dates, Meeting Dates and other Important News

The MASA Planet is the official newsletter of the Minnesota Amateur Spacemodeler Association. It is published bimonthly as a service to its members. MASA authors and photographers retain rights to their submissions, which are used by permission. Send submissions to jeff.taylor@mn-rocketry.net The Planet is available in color on MASA's web site: www.masa-rocketry.org

If your email address, U.S. Mail address, or phone number changes: Please send notice of your change to masa@mn-rocketry.net. Include your name and old and new addresses. We depend on email for communicating important information. When an email address starts "bouncing", we lose contact with you.

MASA Planet

Tech Report

Building an Inexpensive Vacuum Former

By Ray King

If you've ever wanted to build a vacuum forming machine, well here is your chance. I found a nice design at www.halloweenfear.com/vacuumformintro.html, and I modified it so it could be built for under $50. I built this as part of the EMRR design one of these "Retro Spaceships Contest". As I mentioned, my goal was to build this for less than $50.

Here is what you need:

1 - 13" x 19" Heavy Duty Cookie Sheet
1 - 13" x 19.75" x .25 Plexi-glass Sheet
1 - 2.5" PVC 90° Elbow
4 - 6" x 1-1/2" Aluminum Angle Iron pieces
2 - 11.5" x 11.75" x .75" laminated particle board pcs
2 - 19.625" x 11.75" x .75" laminated particle board pcs
2 - 5/16" x 8' screen frame material
8 - Plastic screen frame corner pieces
8 - Large paper clips
1 tube silicone caulk


Photo by Ray King

Start by drilling 1/16" hole in one corner of the cookie sheet and continue drilling 1/16" holes 1 inch apart over the entire surface. Next, drill about 2" hole in the center of the plexi-glass sheet. Then glue the PVC elbow over the center of the hole so that the elbow is pointing out toward one end of the Plexi-glass sheet. Next, assemble the particle board into a box using the aluminum angle iron. Cut a clearance hole or slot in one end of the particle board box for the shop-vac hose. Now test fit the box, Plexi-glass sheet, and cookie sheet. The slot in the box should align with the elbow mounted to the plexi-glass. Mark and drill the mounting holes through cookie sheet and Plexi-glass into the box. Next put a thick bead of silicone caulk on the edge of the cookie sheet then lay the plexi-glass sheet over it making sure the cookie sheet and Plexi-glass seal. Mount this assembly to the box. Finally, assemble the 2 screen frames making them slightly larger than the cookie sheet.


Photo by Ray King

Operation is pretty simply. Clamp a piece of plastic (polystyrene, ABS, etc.) (thickness is your choice) between the screen frames using the large paper clips to hold the frames together. This assembly should be heated. I used our oven at 375° for about 2 minutes (I tested various temperatures and durations and found this to be the best for the size of piece I was making). With the shop-vac attached to the PVC elbow, turn it on and place the master onto the cookie sheet. After the plastic is heated quickly place it over the master pushing all the way to down until the plastic contacts the cookie sheet. The vacuum will then take over. Once the plastic begins to cool; turn off the vacuum and carefully remove the master.

A couple of hints I learned... the master can be made of just about anything that will resist heat. I experimented with wood and even foam

Continued on Next Page


Photo by Ray King

Vacuum Former Continued

insulation (the pink stuff). I used the insulating foam for my project because it was much easier to form to my desired shape. At held up to the heat pretty well. After the 5th cycle it showed significant deformation so if you are going to make a lot of parts; go with something more rigid such as wood. Another hint: I used baby powder as a release agent it worked really well.

I will be downscaling this soon to make nose cones. If you are interested in that design let me know.

Ray King

Photo by Ray King

Photo by Ray King

Photo by Ray King

MASA Planet

National NAR Event Opportunity

Donate a Rocket and be a Part of History at NARAM 50

By Carol Marple

The organizers of NARAM 50 have planned a "Fly-it / Take-it" event for kids (13 and younger) or first-time flyers of any age to have an opportunity to fly an already-built rocket. The organizers have requested that NAR sections build between six and twelve rockets for donation to the event. The only restriction is that the rocket(s) must fly on a single 18mm black powder motor (motors are being donated by Tom Ha of NARTS).

MASA will be supporting this fantastic event by donating a minimum of 6 built rockets. We'd like to donate more than that, but we need your help donating and/or building.

A number of members have volunteered to build and donate a rocket, with many members offering to donate more than one built rocket!

NARAM 50 organizers are encouraging patriotic, themed, or section-specific decorations on the donated rockets. Jeff Taylor, the MASA Planet Newsletter Editor, has generously offered to supply waterslide decals of the MASA club logo for club members to use in decorating their rockets.

I will collect the donated rockets at the April launch (April 26) and the May club meeting (May 1). All of the donated rockets will be shipped to the NARAM 50 organizers in early May.

If you're interested in participating but haven't already signed up, please contact me through email at carol.marple@atk.com.

This is a fantastic opportunity to show our commitment to "paying it forward."

Carol Marple

National Association of Rocketry Annual Meet
NARAM-50
The Plains, Virginia
July 26 - August 1, 2008
www.narhams.org/naram50/

MASA Planet

MASA Directory

Minnesota Amateur Spacemodeler Association
NAR Section 576
Established January 1998
Founding President: Russ Durkee

Club Website
www.masa-rocketry.org

President and Webmaster
Alan Estenson - estenson@mn-rocketry.net

Vice President
Carol Marple - cjmarple@peoplepc.com

Secretary/Treasurer
Rick Vatsaas - rick@vatsaas.org

MASA Planet Newsletter Editor
Jeff Taylor - jeff.taylor@mn-rocketry.net

Contributors to this issue:
- Alan Estenson
- Carol Marple
- Ken Jarosch
- Jeff Taylor
- Ray King

Get the Most Out of Your Hobby - Join the NAR

Consider becoming a member of the NAR (National Association of Rocketry), and help promote the safety and future of our hobby. For more information about the NAR and on how to become a member, visit the NAR's web site at **www.nar.org**

On-Line Rocketry Forum Has Something for Everyone

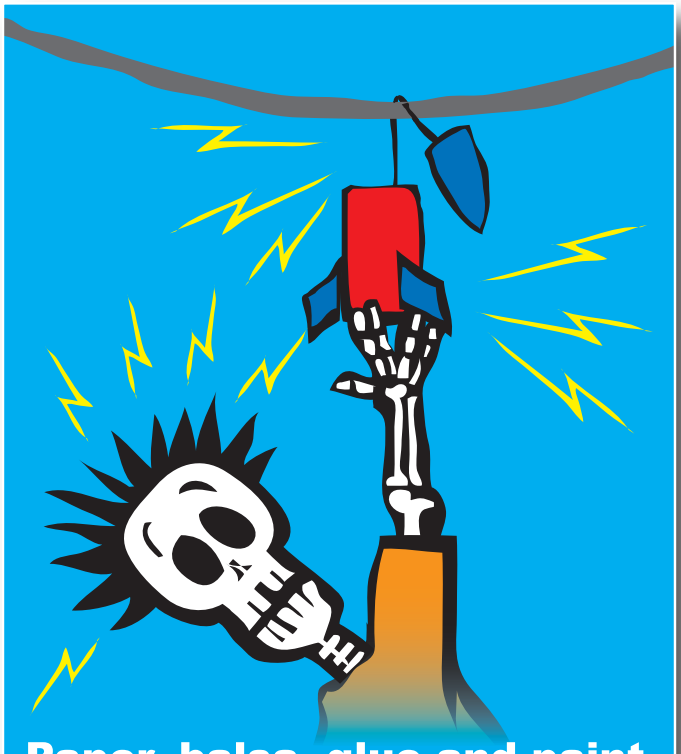
www.rocketryforum.com

The Rocketry Forum (www.rocketryforum.com) is an on-line forum that literally has something for everybody. Post and read messages with other rocketeers about all aspects of the hobby. Find out how other rocketeers handled the issues you have with that latest kit you are working on, or just log on to show off your latest paint job. It's fun, informative and it is free. Sections include low, mid and high-power rocketry, propulsion, support & recovery, product reviews, techniques, rocketry contests, events and even a yard sale. Check it out today!

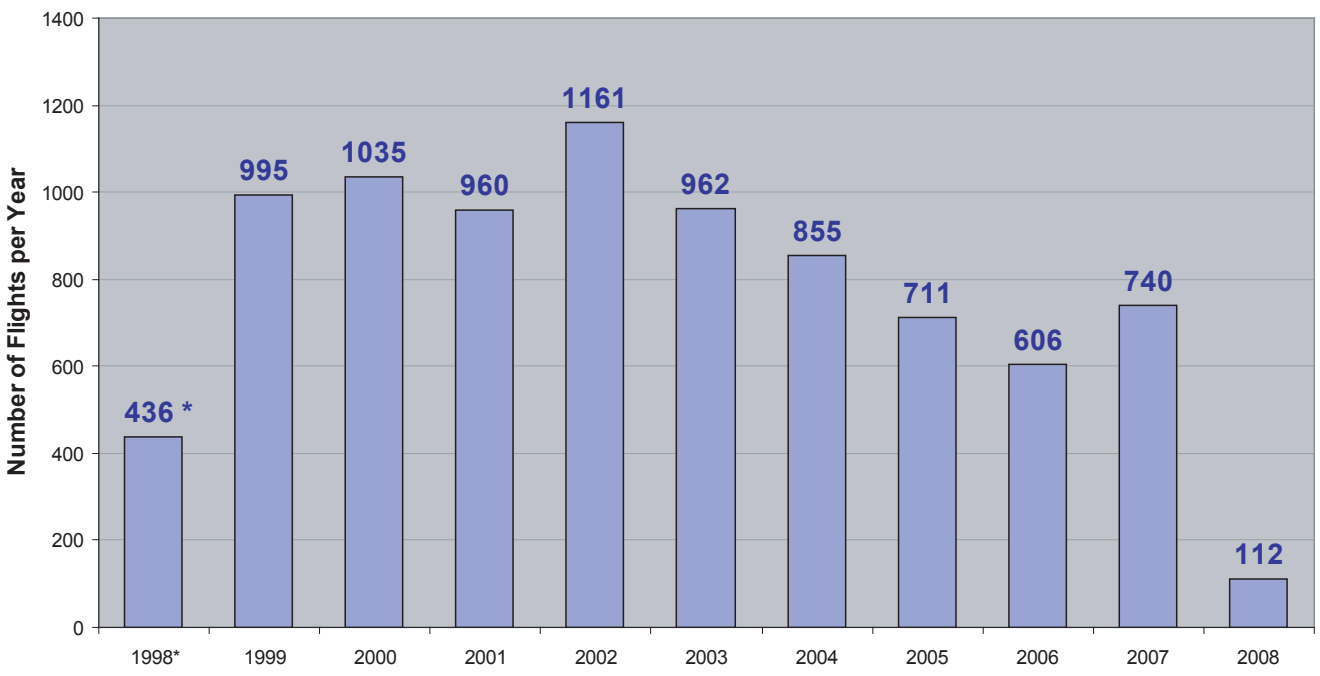
The Rocketry Forum logo used with permission.

Time to Renew MASA Membership for 2008

All MASA club memberships expired at the end of 2007, so make sure you renew your memebership now for 2008 via the club website!



MASA Stats - How Many Flights per Year?



* 1998 only included the last half of the year. Records were not taken prior to that.

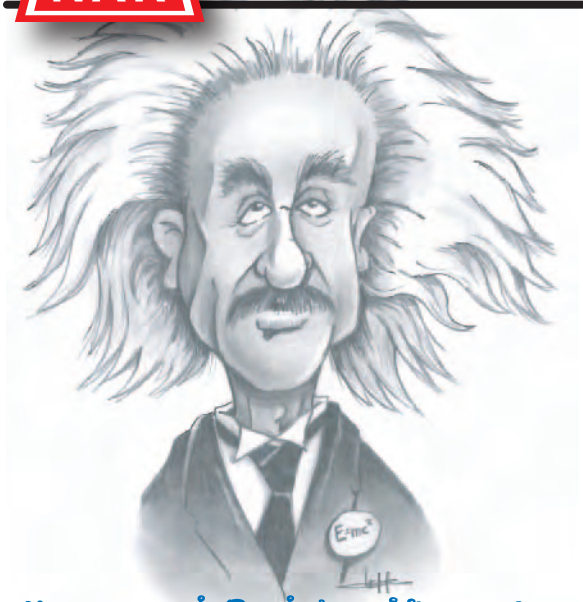
Remaining 2008 NAR National Events

team america rocketry challenge

May 17
TARC Finals
The Plains, VA
www.rocketcontest.org

May 24-26
NSL 2008
Orangeburg, SC
www.nsl2008.org

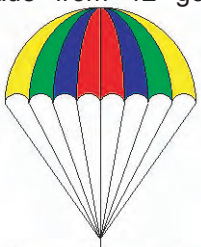
July 26-August 1
NARAM-50
The Plains, VA
www.narhams.org/naram50/



Happy 129th Birthday, Albert. March 14.

Ready for an upgrade from plastic parachutes or looking for a custom parachute to bring down your heavy rocket?

Chutes by Boe makes quality parachutes out of ripstop nylon gores and braided nylon cord. Highly efficient hemispherical parachutes are made from 12 gores. Mushroom parachutes are made from 4 gores, and are perfect for rockets with smaller parachute compartments, or they make great drogues. Send an email to chutesbyboe@comcast.net to get the latest pricing and an order form. Or chat with the Boe family at the next MASA launch!



Chutes by Boe

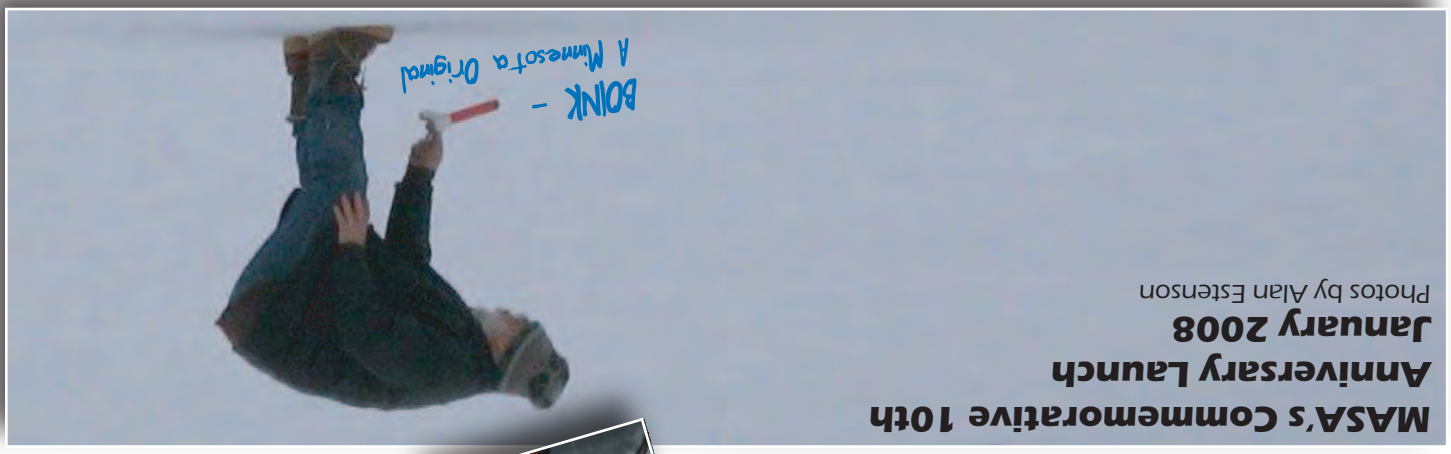
http://web.mac.com/boefamily5/Chutes_by_Boe/Home.html

MASA Planet

Place Postage Here

MASA Planet
c/o Jeff Taylor
9240 University Ave NW #209
Coon Rapids, MN 55448

ADDRESS SERVICE REQUESTED



MASA's Commemorative 10th
Anniversary Launch
January 2008
Photos by Alan Estenson

MASA Planet