The Zog-43

The Newsletter of NARHAMS, NAR Section #139.
NAR National Champions 2001, 2004

NARHAMS is the only seven time winner of the NAR "Section of the Year" award. Years won: 1997,1998,1999, 2001, 2004, 2006, and 2007

The ZOG-43 is an eight-time winner of the NAR/LAC "Rockwell" Trophy, recognized as the best NAR section newsletter. Years won: 1969, 1973, 1975, 1990, 1991, 1992, 2003, & 2004

April 2010
Vol 32. Number 4

In The April Issue

In this month's issue we have an article regarding the Kit Bash Contest we had in 2009. It is a fantastic article but the only thing missing was the history of Chris Kidwell's grey "stealth" rocket. John McCoy has also contributed an article on Micro maxx rocket gliders (my Townhouse neighbors are really going to love me). We also have the overall results from HQSM44 that was held in March. Ed Pearson has also contributed two articles on The Marine Corps Museum and a Narhams Member going into high places. I also want to thank John McCoy for the photos he took at the March Sport Launch

See everyone at the Rocket Range

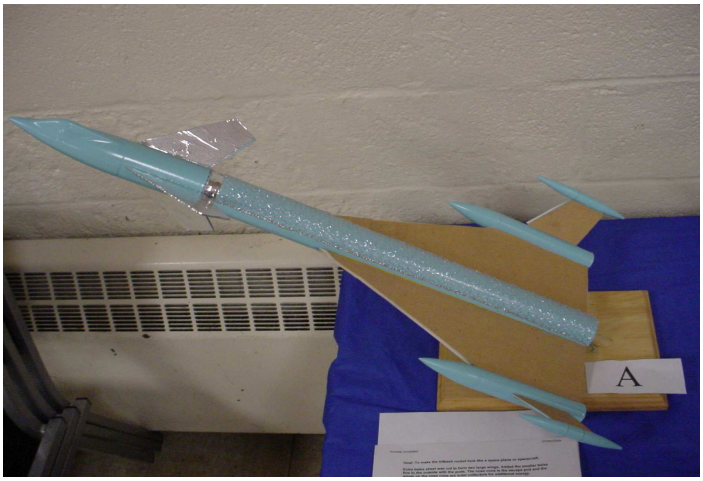
Brad

In this Issue:

NARHAMS DOES KITBASH: READ ALL ABOUT IT !!!!!!

By: Jim Filler NAR #27862

Back in Sept of 2009 the club had put “Kitbash Building Session” on the planning calendar for the activity at the monthly business meeting. We talked about this prior to meeting to establish some parameters. Through the sponsorship of Hobby Works in Laurel, Md. NARHAMS member Scott Branche also the store manager, was able to acquire a dozen Estes Renegade-D models and to add to the flexibility a half sheet of balsa 3/32”x3”x18”. The rules were pretty straightforward, use anything in the bag including the bag itself, the kit header card and the written instructions along with the extra balsa sheet. Design, build, finish and fly a model that you “bash” together with your imagination and skill. The model had to fly once, and then be brought to the annual Holiday Party to be displayed and then voted on. Once again Hobby Works of Laurel came through and provided prizes for the top five finishers.



Maria Ha’s kit bash model Photo By: Raul Pena

Maria’s idea was to make a space plane. Here are her comments about the model. She wanted a sustainable living space as a part of the model. “The paper covering on the wings reminded me of river sand, so to follow that theme I chose to represent water with a blue body color. The fins are covered in foil to simulate solar panels. The silver wire mesh is an electron net to capture stray electrons from space. The nose cone is the escape pod in the event of an emergency”.

Maria and her model getting ready for her qualification flight. Photo By: Kevin Johnson

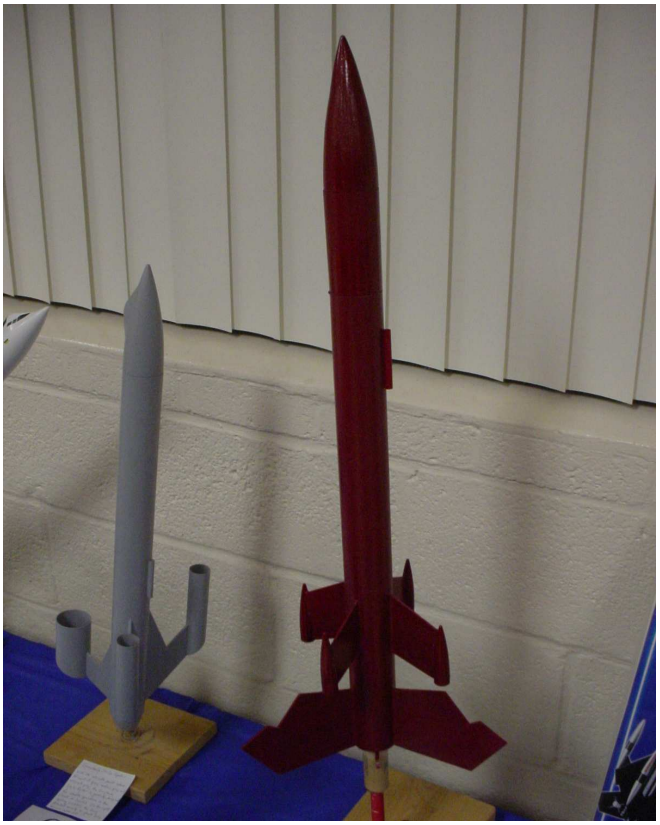
The next model entered was the model on the left of the next photo. This was entered by Chris Kidwell. The model on the right was done by Tom Ha. Here are Chris’ comments on his model.

With its intricate paint scheme of neutral gray, medium gray, and aircraft gray, the Gray Hawk Strike Fighter is perfectly designed for stealth operations in the clouds of Deneb 5. In the right lighting conditions, the finely detailed accents in ghost gray become apparent.

The inspiration for this design came from memories of various futuristic looking models in the Estes inventory from the 1980s, when I first got into model rocketry. I didn't have any particular model in mind when I started designing, but it ended up looking like the Excalibur. Perhaps one day, I will do an "air show" version of the Gray Hawk Strike Fighter in more vibrant colors for greater audience appeal.

Here are Tom’s comments on his model. My model was finished with three coats of gray primer/filler, one coat of Krylon indoor/outdoor cherry red, a coat of Krylon glitter paint and finish coat of Future floor wax. I made the following changes to the kit design:

Con’t on Page 3



Chris Kidwell's & Tom Ha's kit bash models Photo By: Raul Pena

- Changed the fin shapes
- Changed the fin locations
- Changed the number of fins
- Changed the sizes of the fins
- Used all seven nose cones in different places
- Added a payload section
- Added a separate streamer-recovery payload
- Changed the engine mount location
- Created an SPP – a Spare Parts Payload, to recover with the rocket

What you cannot see from an external view:
The final two nose cones were glued to either end of one of the tubes that they were meant to be glued to, and a long strip of the kit bag was formed into a streamer that was rolled around the outside of the tube and taped into place. This was added as a bonus ejection item for show. Also a payload is included that stays with the rocket.
As part of the above, I used all the balsa fins, all the nose cones and also parts of the kit bag, display card and instructions in my final rocket.

The next model entered was by Kevin Johnson his model was a BOMARC that is not included in the group pictures here. Kevin had accidentally left the cloaking device on and could not find the model in the back of his car. Here are Kevin's comments about his build. They say good designers borrow from others, buy great designers steal outright. My kit bash took the parts of the Renegade and from them, recreated a manned version of the BOMARC.

Two of the BT-50s became the ramjet engines. The PNC-50s provided both the tail cones and the intake spikes by cutting off the tips with a razor saw. These tips were glued to the centers punched out from the die cut cardstock centering rings, and then glued into the front of the ramjet tubes.

Kevin Johnsons' "Bomarc" kit bash model Photo By: Raul Pena

The vertical and horizontal stabilizers are made from the fins in the kit. I utilized the extra balsa to create the wings, but instead of making the shape exactly like the BOMARC, so I made the trailing edges match the shape of the horizontal stabilizers giving a distinct stealthy batwing look. The paint scheme is pure BOMARC, overall gloss black with white trim monokote used for the wing and fin tips, and the stripes on the forward fuselage. The kit decals were cut up to use what I wanted.

I added quite a bit of nose weight in the form of clay in the cone to balance the model with a C11 motor. First flight was flown out at Craig Zicafoose's in an unpainted state to verify stability. Second flight was at the NARHAMS sport launch after painting. The reason you might have missed the model at the holiday party was because I forgot to put it in the car.

Con't on Page 6

About NARHAMS

NARHAMS serves Baltimore, the state of Md., Washington DC and the surrounding Metropolitan areas. The club is a section of the National Association of Model Rocketry (NAR) and we are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only seven time winner of the NAR "Section of the Year" award.

Years won: 1997,1998,1999, 2001, 2004, 2006, and 2007

NARHAMS members regularly fly their model rockets at NASA's Goddard Space Flight Center on Soil Conservation Rd. in Greenbelt Md. The launches are open to the public and are held the first Sunday of every month (weather permitting), starting at 1 PM.

Sport Launches are usually held the third Saturday of every month at Old National Regional park near Mt. Airy, Md. Check the web page for updates.

NARHAMS welcomes all prospective new members to our monthly meetings. They are held on the first Saturday of the month from 5:30 to 9:30 PM at the College Park Airport Annex Building. Dues are 10 cents a week, with an initial 50 cents up front (good for 5 weeks) as a sign of good faith.

Monthly meetings available on-line via chat-room , simply go to the NARHAMS homepage and click on the link.

Directions to College Park Airport:

Follow I-495 to Kenilworth Ave. South. Make a right onto Paint Branch Parkway, then make a right on Cpl. Frank S. Scott Dr. At the airport entrance go straight to the Operations Building, the annex building is adjacent to the "Ops" building.

ZOG-43

Volume 32 Number4
April2010

ZOG-43 is the official newsletter of NARHAMS the National Association of Rocketry Headquarters Astro Modeling Section # 139

NARHAMS is the oldest model rocket club in the United States!

ZOG- 43 is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing the most current, up-to-date information on model and real world rocketry, and to provide educational material as well as entertaining information. ZOG -43 is published monthly and is available to anyone on a subscription basis. Current rates are $10 for meeting pickup or email or $15 for postal mail U.S. Funds for 12 issues a year, payable to NARHAMS Material in ZOG -43 is not copyrighted. Free and unlimited reproduction is granted with the proper credit to the author and/or ZOG-43.

For more information.....

If you have any questions about ZOG-43 or NARHAMS, or if you have any comment(s), correspondence, free merchandise or if you'd like to submit an article, send them to :

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National Museum of the Marine Corps by Ed Pearson

Recently I made my first foray to the National Museum of the Marine Corps in Triangle Virginia. I went at the invite of an educational specialist there to scout out a possible model rocket launch site for some planned programming. But this is not the story, merely a mention because this is NARHAMS and it is notable they are thinking about a model rocket launch. Enough on that.

If you are a military or history buff, this is a place to go. Located on thirty acres of land less than a mile away from the Marine Corps Base, Quantico, the museum opened in 2006. The exhibits are tastefully done with hundreds of artifacts from medals, pistols, bazookas, recoilless rifles, to a Harrier jet, Curtis Jenny, and two Corsair aircraft. See the flag that flew over Iwo Jima and money signed by the first Marine commandant. There are two floors (called decks) of galleries built unobtrusively into the side of a hill so most of the museum is really underground!

But upon entering the museum, one walks pass the visitor desk and into the atrium which soars more than 210 feet above you. Natural light bathes you even in the winter months and one looks up to read the stone engraved inscriptions re-bathing you in the warrior ethos: "'Casualties--Many, Dead--Unknown, Combat Efficiency—We Are Winning.' Colonel David Shoup" reads one.

There are lots of projection screens showing footage from WWII, Korea, Viet Nam and some immersion exhibits intended to make you part of the action, e.g., being on a landing boat assaulting an enemy-held Pacific atoll.

There is some commercialism as well. One gallery lets you shoot lasers from an M-16 rifle to see if you can hit a target's bull's-eye about 25 meters away (reminding one of those short military ranges used to adjust an M-16 sights). This novelty costs five dollars for three shots, but it is the only charge – as there is no admission or parking fees.

One can spend other script however at the gift shop near the entrance – Ooh-rah and Semper Fi – or at the second deck's mess hall and adjacent (beer) tavern. Apparently some Marines are drinkers, tradition has it.

The museum is open daily from 9am-5pm, except Christmas. No reservations are required for group tours (20 people or less) conducted by docents (retirees or active duty personnel detailed there) at 10am, noon or 2pm. Or tour on your own.

In some ways the place isn't a museum; it's an adventure.

The National Museum of the Marine Corps is 36 miles south of Washington. To get there, travel on I-95 and take exit 150A. Head to the light and make a right (this is Route 1 also known as Jefferson Davis Highway). The entrance to the museum is ¼ mile on the right. The formal address for your GPS and MapQuest inquiries is 18900 Jefferson Davis Highway, Triangle, Virginia 22172.

Please note that before I-95 exit 150A you will see a museum sign, but there is no sign telling you to make the right on Route 1 after you leave I-95. So be warned to make that right, else you will head right into the Quantico base and the Marines are looking for a few good men and women!

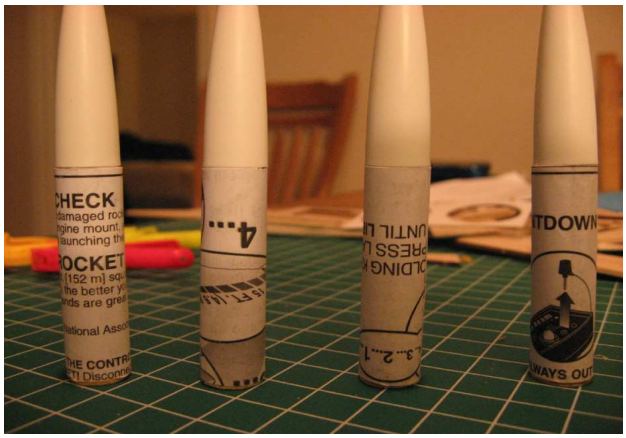
Wanta call? Their number is 703-649-796. See their Web site at www.usmcmuseum.org

So grab your gear and take your stations. That is all.

Jim Filler's kit bash model Photo By: Raul Pena

The next model was done by Jim Filler. The "Uprated SST Shuttle". This latest version of the Classic SST Shuttle was developed based on modern day parts availability with some improvements and of course restrictions from what was included to use from the Renegade-D kit. The original version was set up with a ST-10 for the main ship and a ST-7 for the glider. The original also mounted the glider on the bottom side of the booster. This version was improved to have the glider ride piggyback on top so it can take off from a horizontal runway or upright like a missile. The original also had 4 add on ramjets on the bottom of the main wings. This up-rated version utilizes the same ST-5 size motors, but now has full nozzles and full nose cones.

The add-on motors on the bottom of the wings were rolled by hand from the paper included in the kit instructions. The nozzles for the motors on the bottom of the wings were also fabricated from the instruction sheet.



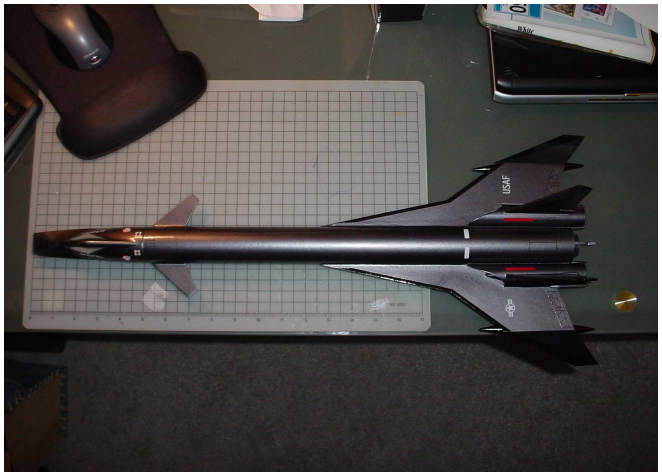
Homemade body tubes from the kit instructions Photo By: Jim Filler

Everything else used to build the model was either a stock part from the Renegade-D kit or the supplied ½ sheet of balsa. Decals were ordered from Semroc the Centuri SST Shuttle was a "Retro-Repro" Semroc X-Kit some time ago, so the decals were still available. Some of the other decals added were from various Rokit-flite Kits.

The next model received the most votes by the attendees for First place, the "Saber Tooth" by Raul Pena. His comments and even some storyline for inspiration follow.

(U//FOUO) During the late 70's Major Mitchell Gant, a Vietnam veteran and an officer in the U.S. Air Force 77th "Ghost" Air Squadron (Unit Location Classified) infiltrated the then Soviet Union and successfully "retrieved" the stealth fighter MiG-31, NATO codename "Firefox". The Mig-31 was an advanced super fighter that, according to intelligence reports of the time, exhibits stealth technology on its structure, was capable of speeds exceeding Mach 5, and its weapons were controlled by artificial neural receivers built into the pilot's helmet that would

Con't on Page 7



Saber Tooth Fighter Photo By: Raul Pena

Interface with the pilot's thoughts. During its successful retrieval it was discovered that the weapons fire orders had to be in Russian and that its missiles were in an internal bay.

(U//FOUO) The advance technology and weaponry recovered from this mission were studied and counter measurements were deployed along U.S. borders. Many of these technologies were further studied and enhanced to later be implemented in the construction and deployment of other aircraft. Advances in jet propulsion, stealth, radar, weapons, ECM, flight engineering and design that were born from studying the MiG-31 can be seen in aircraft like the SR-71, the F-117, the B-1 and B-2 bombers, and more recently the F-22 Raptor and F-35.

(U//FOUO) The Multi Vector SRFB-77A aircraft, codename "Saber Tooth", was the first operational stealth prototype aircraft deployed by the Skunk Works program in the early 80's. Most of the technology and advance aerodynamics from the MiG-31 were employed in the Saber Tooth, like four internal weapons bay for mini cluster bombs and missiles, radar-absorbing paint and materials, and angled surfaces. The Saber Tooth also had an advance pulse detonation central engine and employed a relatively new technology called "aero elastic" control surfaces on the nose of the aircraft.

(U//FOUO) Although the existence of the aircraft was recently declassified by the U.S. Government, details of its technology, craft characteristics, and missions are still highly classified. It is also unknown how many of these were constructed and if they are still in use.

Renegade mod for a Saber Tooth Fighter:

All the parts of the Renegade were used for this kit bash except for the small BT and the tube coupler. Construction of the MM, parachute, and use of the nose weight was as per instructions. I used the original laser-cut balsa fin sheets plus the extra provided for the fins of the Saber Tooth. I had to adjust the size of the original fins to the balsa provided since the original design called for larger fins. This was not bad as downsizing the templates made for a better looking model. The "wings" were made out of three pieces: the main wing from two pieces from the extra thicker balsa sheet and the tips from the original thinner sheets. The canards, "top" and "bottom" fins were made from the original balsa sheets also. The main wings were glued to the main BT first without the wing tips first. The biggest mod was changing the side pods to simulate jet engine intakes and exhausts. Took the NC's for the side pods and cut 1" from the top, then split the tips in half. From the left over balsa I made two centering rings that would fit into the pod BTs and also cut those in half... one for each half nose cone tip. Each tip was laid flat on wax paper then glued to a "half centering ring" using CA glue. I marked the pod BTs with four lines like if I was going to make a 4-fin rocket. The intake form was drawn on the side pod BTs ensuring that the "peak" and "low" of the forms were centered on opposite lines. Carefully cut along the lines with a sharp knife and lightly sanded the contours. Later I split the BT along the "peak and low" lines. Once the main wings were dried I glued the "engine" housings on the top and bottom of the wings, extending .5 inches pass the main BT. The gap at the end of the "engine housings" was covered on the outside with balsa strips to add detail to the rocket. Two "elongated" centering rings were made from the left over balsa and glued .5 inches inside from the end of the "engine housing". Last I added the nose cone tips with the half centering rings to the engine "intakes". The angle for the wing "tips" was created by laying the BT on a flat surface with the wings leveled, then gluing the wing tips.

The balsa was treated with two coats of Elmer's Wood Filler, sanded, and then given two coats of gray primer. After final sanding it was painted with Tamiya Gun Metal and the external fuel tanks with

Con't on Page 9

McCoy's Micro Wonder Works

Micro Ecee Rocket Glider - Micro Model No. 300 -2.6 DownScal

Original Design by Robert Edmonds

Down Scale Drawing by John McCoy Sr.
Drawing Completed: 10-02-2004
Model 300 Completed: 11-06-2004

1 inch square

3/32" Aircraft Plywood

1/32" Balsa

1/16" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/32" Balsa

1/16" Balsa

.25"diameter x .375" hardwood dowel Canard lock down piston. Wrap aft .125" with thin Kavlar Thread CA'ed in place.

Front

1/16" Balsa

1/16" Balsa

.020" MusicWire x 1.032" ID

T-2 (.281"dia.) X 4.625" long motor/piston tube with .125" dia. hole .25" from the Forward end.

Front

NARHAMS Member in High Place by Ed Pearson

This past December the Mt. Airy Town Council elected NARHAMS member Peter Helt to the position of city Mayor and Council President. Peter had originally been appointed a Mt. Airy councilman in August 2009 to fill a vacancy when another councilman retired.

Peter Helt first joined NARHAMS as a Montgomery County high school student some 30 years ago. He obtained his undergraduate degree from what was then called Frostburg State College (now Frostburg State University) in Allegany County and then went on to law school. He became a member of the Maryland State Bar in 1986 and the D.C. Bar in 1988. He currently serves as an Associate with the firm of Baylinson Kudysh and Greenberg in Mt. Airy (Carroll County, Maryland).

You don't see Peter often at our meetings—but he does come for reunion events. The last time I talked to him, he had not seen our Mt. Airy launches, but was aware of them. Peter Helt remains a section friend and his dues are paid until 2013. Good going and congratulations to Peter.

NARHAMS Shirts!!!!!

Cash Only Please !

The Stock I have:
Adult XL T-shirts @ 9.00 each
Adult XXL T-shirts @ $10.00 each
Adult XL Crew Sweatshirt @ $18.00 each
Youth L T-shirt @ $8.00 each
Infant, Toddler Shirts @ $7.00 each

Tamiya Metallic Black. Custom decals were printed on an ALPS printer. Some of the original decals were modified and used on the model as well. Two coats of Future Acrylic were applied to protect the finish and decals.

The "Art of Kit-Bash" can certainly be a lot of fun as a fun type contest and certainly a great club activity. Thanks again go out to our local hobby store and the support of our club. Thanks to Hobby Works in Laurel, and thanks Scott !

Micro Model Magnifying Corner: By "Micromeister": John McCoy - NAR-15731

Micro Rocket Gliders:

Last time we discussed BG's now lets look at RG's. Rocket Gliders are a little more involved then Boost-Gliders as they must retain their spent motor casing through out the entire flight. This means for them to transition from boost to glide there must be some sort of CG or Balance shift. Either by physical moving mass or mechanical geometry change.

We have three examples to work with and talk about this month. The first and simplest of the types is the Slide wing. This may sound easy but getting small wooden parts to slide smoothly from one point to another without damage or destruction is a good bit harder then it sounds. There are a number of Slide-wing plans available through the internet that can be downscaled for Micro use. Last year Fliskits introduced a very nice micro kit called the Nanite RG. With a wingspan of 6-3/8" and an overall length of just under 7" it's a very nice looking little model. It is also a bear to get to perform as designed. As with most micro models the wood tends to bend under the load of the rubber band mechanism. Very careful adjustments must be made to get it to slide and transition correctly but it has set a new Micro RG duration record of 49 seconds July of 09. This models geometry change is as the name implies by sliding the wing forward at ejection.

Our second type of balance shifting model is one that changes the elevator angle via a .020" diameter spring at ejection. With an almost identical 6.5" wingspan this model is one of my personal favorites and if trimmed correctly can turn in some impressive times as well. Keeping these models in alignment seems to be the biggest bugger, making the model turn more then wanted, shortening flight durations. Another factor is keeping all unnecessary mass from these little models. I've used mainly solid balsa wings with these little jewels where a tissue covered cutout airfoil may lighten the model giving a bit better performance and flight time.

Last is the downscaled version of Rob Edmonds EC canard RG glider. I call my downscale the EC-8thA. Built completely with contest grade balsa and airfoil sanded to Robs instructions I've had some rather interesting flights with this model. She has a tendency to do a single loop under thrust that I haven't yet been able to trim out. Once the model transitions at burnout it settles into a wonderful flat slow glide that would be super if it has more of its original altitude. This model is such fun to fly I've been toying with a Micro RC version using electromagnetic servos with a tiny transmitter and Lipoly battery. All in all these RG's are super fun and a real challenge to build. I'll include the EC-8thA 1-page plan for this month. Give it a try☺

Next month we'll talk about the last Glider type; Flex-Wings. I've had timed 6+ minute flight but have yet to recover a single one LOL!!!

HQSM-44 Meet Champions

Place	Contestant	NAR Number	Section	Total Points
A Division				
1	Ramboz, Devin	NON1	IND	224
2	Wise, Michael	87750	139	208
3	Stalnaker, Patrick	87563	139	178
4	Boucher, Alexander	NON4	IND	132
5	Watson, Matthew	PEND	139	108
6	Davis, Ryan	NON5	IND	100
7	Fleagle, Tyler	NON3	IND	10
7	Stalnaker, Phillip	87564	139	10
7	Thomas, Brendon	NON2	IND	10
B Division				
1	Ha, Zach	79498	139	124
C Division				
1	Kidwell, Chris	45225	139	254
2	Watson, Bruce	89648	139	232
3	Wise, Mark	34702	139	156
4	Grant, Bradley	85261	139	144
5	Harvey, Bill	76228	139	108
6	Filler, Jim	27862	139	102
7	McCoy, John	15731	139	64
8	Ha, Tom	76754	139	26
9	Panek, Frank	89806	139	24
10	Fineran, Ellen	NON6	IND	14
10	Stalnaker, John	86361	139	14
11	Ash-Poole, Jennifer	61415	139	10
11	Greco, Chris	79763	139	10
T Division				
1	YoYoDyne	T-867	IND	252

2010 Calendar of Events

Date	Time	Event	Location
Dec 19	10 am - 4 pm	Sport Launch, Land Your Lander Fun Event (Dec 26 rain date)Stick your landing, win a prize (Tom Ha) Mt. Airy, MD	
Jan 2	5:30 - 9 pm	Meeting, working with plastics (John McCoy), swap meet	College Park, MD
Jan 3	1 - 2 pm	Goddard Launch	Greenbelt, MD
Jan 16	10 am - 4 pm	Mt. Airy Launch, MicroMaxx theme	Mt. Airy, MD
Feb 6	5:30 - 9 pm	Meeting, camera payloads (Scott Branche, Alex Mankevich)	College Park, MD
Feb 7	1 - 2 pm	Goddard Launch	Greenbelt, MD
Feb 20	10 am - 4 pm	Mt. Airy Launch, Cold War models (green with red star)	Mt. Airy, MD
Mar 6	5:30 - 9 pm	Meeting, contest building (Alex Mitiuriev tentative)	College Park, MD
Mar 7	1 - 2 pm	Goddard Launch	Greenbelt, MD
Mar 20	10 am - 4 pm	Mt. Airy Launch, Local Meet contest	Mt. Airy, MD
Apr 4	1 - 2 pm	Goddard Launch (cancelled)	Greenbelt, MD
Apr 10	5:30 - 9 pm	Meeting, kit bash (Scott Branche)	College Park, MD
Apr 17	10 am - 4 pm	Mt. Airy Launch, Maryland Funny Meet 3	Mt. Airy, MD
Apr 25	12 - 4 pm	Rockville Consortium of Sciences build/fly	Rockville, MD
May 1	5:30 - 9 pm	Meeting, finishing techniques, wet sanding (John McCoy, Jim Filler)	College Park, MD
May 2	1 - 2 pm	Goddard Launch	Greenbelt, MD
May 8	12 - 5 pm	Space Day static display, Maryland Science Center	Baltimore, MD
May 15	7 am - 5 pm	TARC Finals, Great Meadow	The Plains, VA
May 15	12 - 8 pm	Mt. Airy Launch	Mt. Airy, MD
Jun 5	5:30 - 9 pm	Meeting, outside speaker TBD	College Park, MD
Jun 6	1 - 2 pm	Goddard Launch	Greenbelt, MD
Jun 19	12 - 8 pm	Mt. Airy Launch, ECRM Regional Meet	Mt. Airy, MD
Jul 3	5:30 - 9 pm	Meeting, night launch ideas (John McCoy)	College Park, MD
Jul 4	1 - 2 pm	Goddard Launch	Greenbelt, MD
Jul 17	12 - 8 pm	Mt. Airy Launch, demo dress rehearsal, ping pong ball spot landing	Mt. Airy, MD
Jul 18	12 - 4 pm	Goddard Contest	Greenbelt, MD
Aug 1	1 - 2 pm	Goddard Launch	Greenbelt, MD
Aug 14	5:30 - 9 pm	Meeting, NARAM report (various)	College Park, MD
Aug 21	12 - 8 pm	Mt. Airy Launch Mt. Airy, MD Details	
Sep 4	9 am - 5 pm	RAMTEC Regional Meet	Ft. Indiantown Gap, PA
Sep 5	1 - 2 pm	Goddard Launch	Greenbelt, MD
Sep 11	5:30 - 9 pm	Meeting, elections, FAI report (Ed Pearson, Chris Kidwell, Kevin Johnson)	College Park, MD
Sep 18	12 - 9:30 pm	Mt. Airy Launch, Super LeMans timed kit build/fly, night launch	Mt. Airy, MD
Oct 2	5:30 - 9 pm	Meeting, glider building session (Robert Edmonds)	College Park, MD
Oct 3	1 - 2 pm	Goddard Launch	Greenbelt, MD
Oct 16	10 am - 4 pm	Mt. Airy Launch, Oktoberfest	Mt. Airy, MD
Nov 6	5 - 10 pm	Meeting, movie night (Ed Pearson), 2011 planning	College Park, MD
Nov 7	1 - 2 pm	Goddard Launch	Greenbelt, MD
Nov 20	10 am - 4 pm	Mt. Airy Launch, R/C glider day	Mt. Airy, MD
Dec 4	5:30 - 9 pm	Holiday party, Greenbelt Community Church	Greenbelt, MD
Dec 5	1 - 2 pm	Goddard Launch	Greenbelt, MD
Dec 18	10 am - 4 pm	Mt. Airy Launch, holiday oddroc	Mt. Airy, MD

ZOG - FORTY THREE
3102 Eden Drive
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Launch Schedule

SPORT LAUNCH
Old National Pike Park
April 24th