TEAM PITTSBURGH

Newsletter of the Pittsburgh Space Command NAR Section #473

2nd Place National Champion Section 2012

JAN - FEB 2013

#168

The Kopter Rocket Story:
A Visit With Walter Senoski

'KOPTER'
ROTOR RECOVERY ROCKETS

Walt Senoski, a Pittsburgh original.

One more reason, Pittsburgh is one cool rocket town !

TEAM PITTSBURGH

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Jerry Kraus
301 Stoneybrooke Drive
Cheswick, Pa 15024
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President	**John Pace**
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TP Editor	**Art Nestor**
Webmaster	**Mike Hardobey**
Website	**http://www.psc473.org**

Submit articles for publication to:
Art Nestor
230 Arthur Street
Zelienople, Pa 16063
Email: artpeg@hotmail.com

The Pittsburgh Space Command Is dedicated to the advancement of safe model rocketry.
01/05/13-79

Editor's note

If you haven't been to our last two launches then you've missed a great opportunity to experience some authentic Pittsburgh rocketry heritage with Kopter Rockets founder, Walter Senoski.

Many thanks to **Professor Francis Graham** for keeping the interest alive in Walter Senoski and Kopter Rockets, the cover subject of this issue. In Meridian Passage #1736, October 03, he put out his annual call to his readers for the whereabouts of Walter. I had casually searched for Walt the last time Francis had brought up the subject but with no luck. However, this time was different. I posted a request on the Yahoo Groups Old Rockets online forum. Dave Fitch very quickly responded with all of Walt's contact information! Amazingly further, Peg and I, just a couple of years ago, had driven within a block or two of Walt's home in Mt. Pleasant and never knew it!

What resulted next was a wonderful visit with Walt and his wife Judy at their home, sharing photos, drawings and the story of Kopter Rockets. Walt literally had us both laughing and crying. This attention in turn led to Walt's renewed interest in flying and showing up at two of our regular monthly launches to demonstrate his gliders. And then finally, this article. I hope you enjoy it! It fills in many details that were slipping away with time. Front page photos by Art Nestor.

Rocket Journal

Don't let your rocketry legacy be lost to time. If you haven't been updating your Rocket Journal, then now is a good time to catch up by adding all your highlights and digital photos of 2012. It's surprising how it all adds up. Years from now, you and your kids and grandkids will be glad you did!

See you at the launch field!

Art

NEW ADDRESS?
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CONTACT:
Jerry Kraus
301 Stoneybrooke Drive
Cheswick, Pa 15024
Phone: (724) 275-9962

ATTENTION NAR SECTIONS:
Please send newsletter exchanges to:
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111 Crystal Springs Drive
Cranberry Twp., Pa 16066
Phone: (724) 742-8692

Walter Senoski & the Story of Kopter Rockets

By Art Nestor

From Meridian Passage #1736:

"In the 1970's, an unusual invention came about in Pittsburgh: a small sport model rocket without a parachute, but with a helicopter-like recovery system hung from a cord. This was the patented invention of Walter Senoski of Baldwin Borough and a basement firm called Kopter Rockets. My friend and Tripoli cohort A.J. Reed purchased one and demonstrated it.

It is not complicated. It flies up to about 700 feet using a small gunpowder motor, then opens a trio of helicopter blades and returns. You built it from a kit.

I did not see these again until the 1990's when another Tripolitan, Mort Binstock, fired them off at a PSC launch at Camp Lutherlyn. It was there that Mort gave me one! I still have it and plan to shoot it off for old memories sake soon perhaps with my grandson.

I took photos (of Mort) *then for a possible article in Rocket Mail or Team Pittsburgh, when I found out whatever happened to Walter Senoski who moved out of the area apparently. I never did find out what happened to him, so I never wrote the article. Perhaps one of you can discover this."* ***- Professor Francis Graham***.

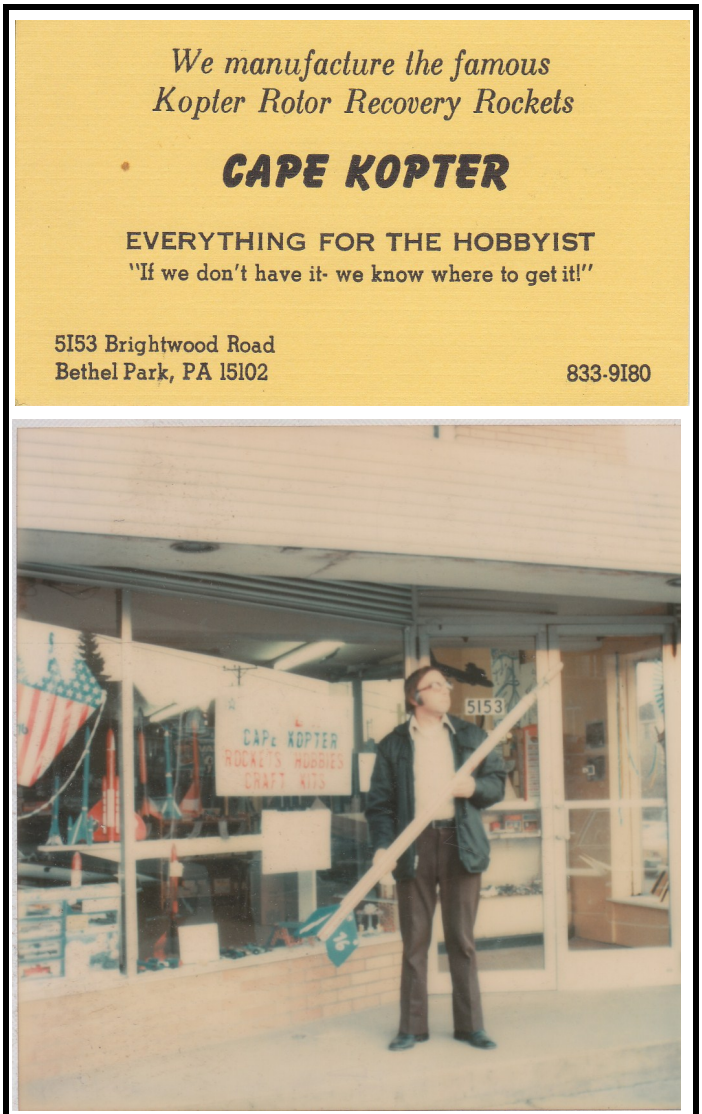
Walt is unclear of exact dates as much of the material relating to his hobby shops and his mail order business, Kopter Rockets, was either lost or destroyed over the years. But he still has great stories to tell and a few of his photos, kit plans and 8 mm movies still survive. The photos in this article haven't been seen in many years and perhaps some never shared with anyone else until now in this Team Pittsburgh exclusive. Walt Senoski is a very important part of Pittsburgh's rocketry legacy.

Walt is pure Pittsburgh. Born in 1935 in Brookline, he's lived in our area all of his 77 years. He graduated from high school at Connelly Vocational Trade School in downtown Pittsburgh where he learned drafting, a skill that served him well later as he created all the drawings for his model rocket patent applications and the rocket kit plans for his mail order model rocket business, Kopter Rockets.

For awhile after high school he worked at Koppers and Dravo Corporation in the drafting departments. He served two years in the military before starting work at Obenchain Corporation, a steel industry engineering consulting firm. It was there that his model rocketry ideas began to take shape.

Already somewhat aware of the new hobby of model rocketry but not yet a hobbyist, Walt began to dream of rocket designs while bored on his lunch breaks. Fascinated with the idea of a rocket that could return to earth under helicopter power, his first workable design was the Kopter Rocket.

His enthusiasm and self described obsession with designing rockets infected his fellow workers. On a visit to an area hobby shop, Walt purchased motors and a plastic launch pad. A group from the engineering department, led by Walt, began to build rockets and fly them in the company parking lot. It quickly became apparent that the parking lot was too small so they moved to the nearby



Walt stands outside his first hobby shop,

Cape Kopter, in Bethel Park.

Walt Senoski and his 32" long, rocket powered car.

construction site of the South Hills Village Shopping Center. Imaginations began to run wild and soon the guys in the Engineering Department began building rocket powered cars and at least twice held racing contests in the shopping center parking lot.

In his own words, Walt was becoming obsessed with building his new rotor recovery Kopter Rocket models so much that he decided to start a mail order business to sell them, appropriately named Kopter Rockets, probably in 1976. This enthusiasm in turn led to him opening a hobby shop at 5153 Brightwood Road, Bethel Park named Cape Kopter Rocket and Hobby Shop. As the steel industry declined in the seventies, Walt was laid off and he decided to go full time with his hobby shop and mail order business.

New designs were created. But his favorites were always the Kopter Rocket and the gliders.

At this time, it's unknown when the first Kopter Rocket catalog was produced. There was ever only one basic catalog but several variations exist as more rocket kits were added and subtracted. Indeed, my own catalog does not include the Bat, Pee Wee or the Mini-Saur glider shown in the Kopter catalog on the Ninfinger Productions/Rockets website but includes instead, the Astros and Delta Streak. During my visit to Walt's home I never saw a Kopter catalog other than the one I brought along. In the course of our discussions, I pulled out my Kopter Rocket catalog that I had once requested by mail a long time ago, postmarked December 29, 1978. Walt looked at it and exclaimed. "I addressed that catalog. That's my handwriting"! (Walt has informed me that since our visit he has found three.)

My catalog advertises these 17 rocket kits:

1. Astros
2. Dart
3. Delta Streak
4. Discoverer
5. Eagle
6. Falcon
7. Hawk
8. Jet-I-son Glider
9. Kopter Rocket
10. Moon Rock
11. Moray
12. Pterosaur
13. Sentinel
14. Spike
15. 2 in 1 Designer's Kit
16. XK-1
17. Zooka

The Jet-I-Son glider rotor unit was available separately and one page of rocket parts rounded out Kopter's offerings. No engines were offered for sale. From the Ninfinger/rockets.org website, you can print out your own hard copy of a Kopter Rockets catalog.

Walt's second store, Bethel Hobby & Toy Shop, was located near the corner of Brightwood Road and South Park Road or 5241 Brightwood Road.

Walt obtained three U.S. Patents on his rocket designs. They are:

US3888178 June 10, 1975 - Model rocket glider

US3903801 September 09, 1975 - Recovery device

US3942441 March 09, 1976 - Model rocket glider

A quick search on the internet can easily bring up Walt's patents in their entirety and be downloaded as PDF files. Four of Walt's patent drawings can be found on page 8.

After about four years, as problems mounted with the location, Walt decided to move his Kape Copter Rocket and Hobby Shop to a new storefront. The local fire marshal was demanding that a $32,000 fire sprinkler system be installed at Walt's expense, the shop been broken into, the parking was not that great and the store wasn't just big enough. He found a second location just a short distance down the road and renamed it, Bethel Hobby and Toy Shop.

A Kopter Rockets' Christmas card created and drawn by Walt's brother in law, Joe.

Above:

An undated photo from page 6 of the July, 1977, Volume 19 #7 issue of The Model Rocketeer.

The original caption reads: Walt Senoski of Kopter Model Rockets explains the theory behind his unique boost glider designs to interested PittCon participants. In addition to running Kopter, Walt also operates a hobby shop in suburban Pittsburgh (named, appropriately enough, Cape Kopter) that features model rocket supplies.

Coincidentally, the NAR's Journal (Sport Rocketry), then named The Model Rocketeer, was being published at the same time just 1.6 miles away from Walt's second hobby shop at Gazette Publishing on 5850 Library Road, Bethel Park. It's editor, Kevin Barkes, lived close by. Pittsburgh in the sixties and seventies was a hotbed for model rocketry, the NAR and the Tripoli Rocketry Society, forerunner of the current national association.

In those days, Walt was an NAR member (number forgotten) and had joined SPARK, Section #399, or South Pittsburgh Area Rocket Klub. While he had only attended perhaps three launches he does have the only known (to me) SPARK memorabilia, a mock up for the printer of a membership card. Spark probably disappeared several years before our own Section, PSC #473, was founded.

One day in February, 1980, a man walked into Bethel Hobby Shop and asked if Walt could help him. Showing Walt a drawing of an interstellar space ship, he wanted to know if Walt could build a model based on his

drawing. “Sure” Walt replied “That’s right up my alley”. Within two weeks Walt had built an 8 foot tall model and the man came in and picked it up.

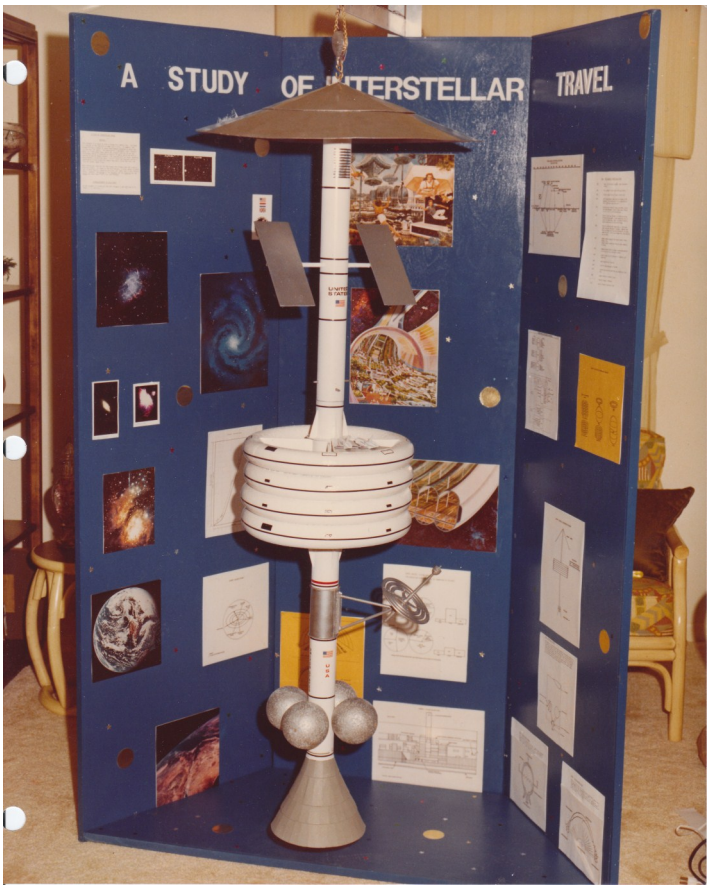
Later that year in July, Walt received a packet in the mail. In that packet was a photo showing the model he had built as part of a Science Fair display, a copy of a Science Fair report and a letter thanking Walt for the fine job he had done on the model. Walt’s model, as part of the display, had helped the man’s son place third in a state regional competition and win a trip to the Johnson Space Center in Houston, Texas.

For an air show demo launch, Walt constructed a large rocket with streamer recovery. On the streamer were printed the words “Kopter Rockets”. See photo below.

Walt was an avid photographer during this period and shot many 8mm films, some of which included his rocketry activities. A few of these films still remain and some have been converted to DVD giving us a tiny glimpse into his past.

Bethel Hobby carried a wider variety of toys and novelties than his previous shop. But Walt just couldn’t compete with the larger retail toy stores that bought and sold at discount and the shop eventually went bankrupt. His second shop had been open about 6 and a half years. Remaining stock from Bethel Hobby was placed in storage in someone’s large garage. Unfortunately, that person passed away before Walt could dispose of that stock and

Walt preps his “Kopter Rockets Streamer” rocket at a local air show location.



Above is the photo Walt received showing the Science Fair display of the winning third place entry.

the heirs or new owners, while remodeling the home, tossed out or sold off $3000 - $8000 worth of Walt’s store merchandise.

The Bethel Hobby Shop bankruptcy was the strain that finally shut down Kopter Rockets. In time, as things improved, Walt considered restarting Kopter Rockets. However, when he found out from an attorney, doing a patent search at his request, that his rocket patents had expired and he no longer owned them, a discouraged Walt gave up entirely on rockets.

Estes Industries never made an offer to buyout Kopter Rockets from Walt. Which is a little surprising to me because there is no doubt that Walt had created several notable classic model rocket designs. When asked by Trip Barber for suggestions as to what rocketry artifacts should be included in a museum’s archives, I listed Kopter Rocket kits along with many other items. Any unopened original Kopter Rocket kits today are considered quite rare and collectable. Especially as a PSC member, if you can find one pick it up.

In 2007, Walt met his current wife Judy at a dance and a year later they were married. All this rocket stuff has been a surprise to Judy.

An undated photo of Walt holding a modified Pterosaur glider. A sharp looking model indeed!

Walt has many stories from his various experiences but perhaps the one he likes to tell the most now is how he was miraculously healed of cancer. In June, 2004 Walt was diagnosed with throat cancer while being treated for chest pains. A lifelong heavy smoker, he had experienced problems with his throat since 1988. It was a diagnoses he had suspected for many years but had refused to seek medical treatment or to stop smoking. Relying on his faith, he made numerous pilgrimages to the small village of Medjugorje in Bosnia-Herzegovina. Walt says that after one such trip in 2005, he received a "blessing of the throats" at a nearby church in Dubrovnik and he was instantly healed.

Walt has written four books inspired by his miraculous healing and they can be found on Amazon.com. **However, he would prefer you contact him through his website www.waltersenoski.com to purchase a book.**

The titles are:

Gather the Broken Pieces (2009)

Pain Versus Love (2009)

Divine Mercy and Why we Need it (2010)

In Thanksgiving (2010)

Daughter Lisa Senoski poses for the camera holding a Jet-I-Son Glider .

So where does the future of Kopter Rockets go from here? Walt has begun remanufacturing several Kopter Rockets kits (Pterosaur, Jet-I-son glider and Kopter Rocket) in an extremely limited quantity to sell. But wait there's more! At your request, Walt will personally autograph your kit! He is also considering building a slightly up-scaled Pterosaur glider that should provide some awesome flights. At this time, there is no Kopter Rockets website so for questions or pricing & shipping information on Kopter Rocket kits you can email Walt at kopterrockets@zoominternet.net. **If a new Kopter Rocket kit interests you at all, don't delay in ordering.**

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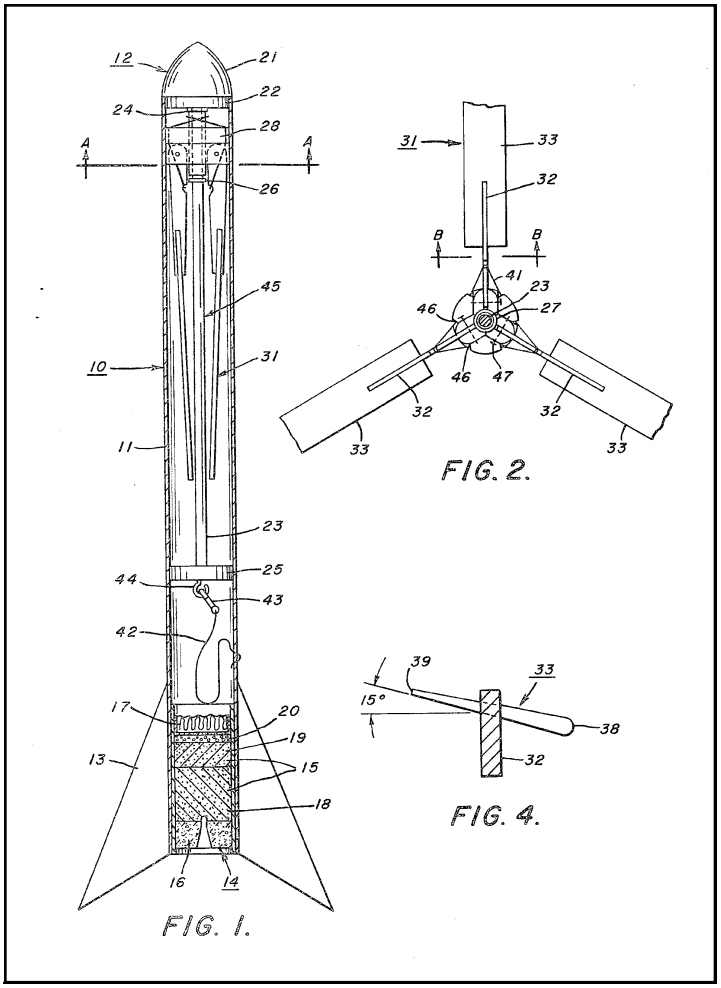
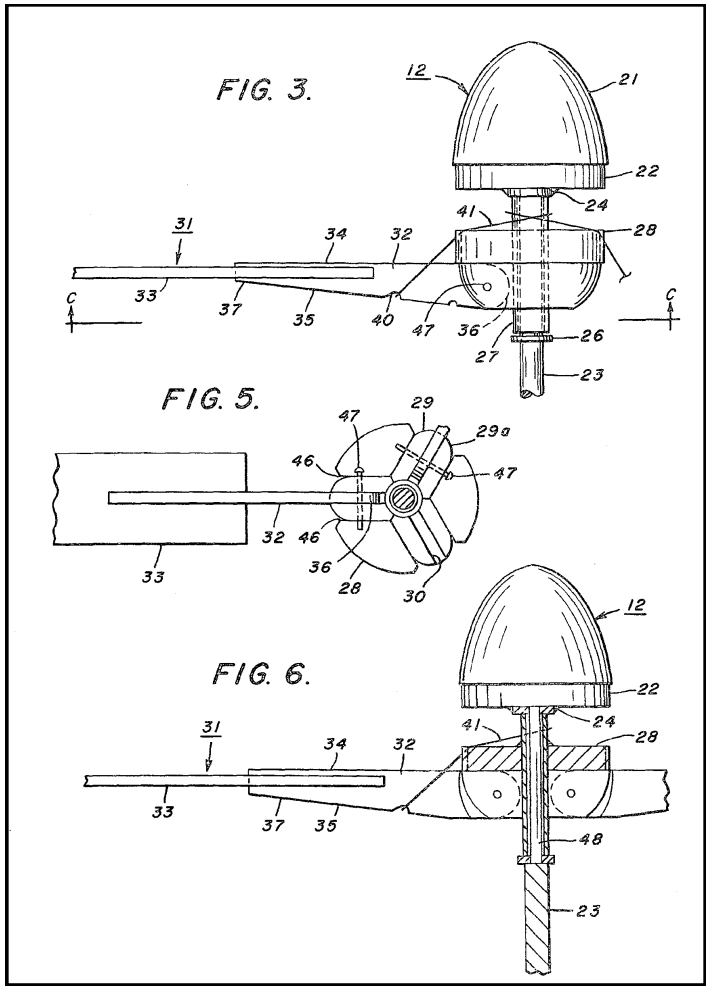
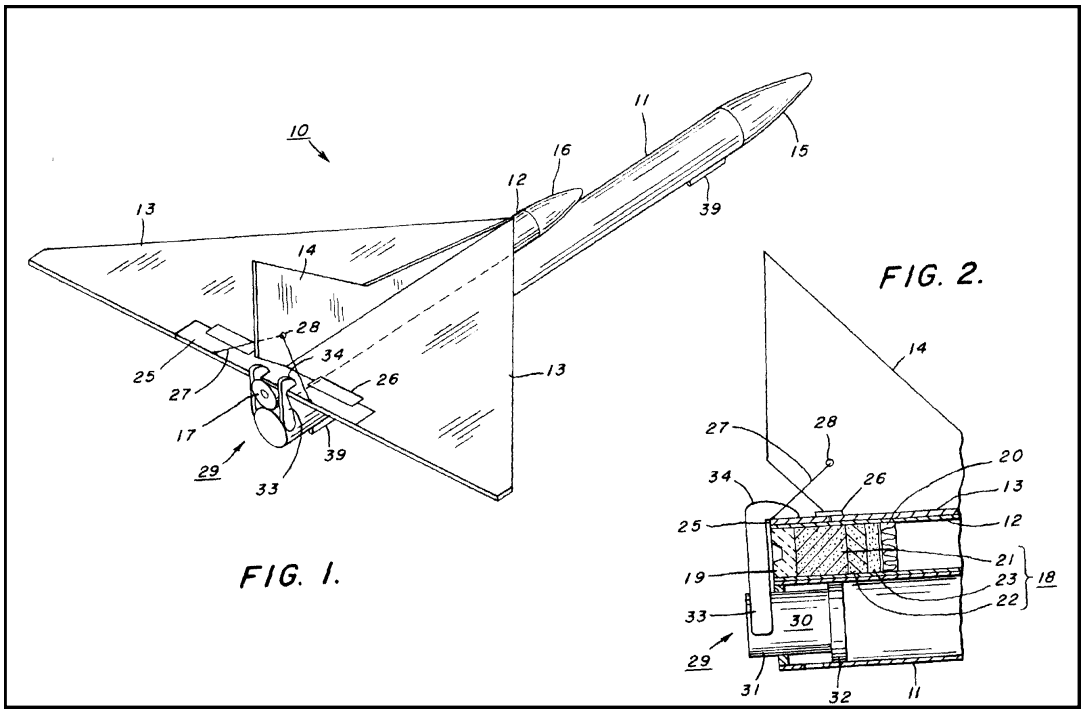
Judy & Walt in their Mt. Pleasant home on October 19, 2012. Photo by Art Nestor.

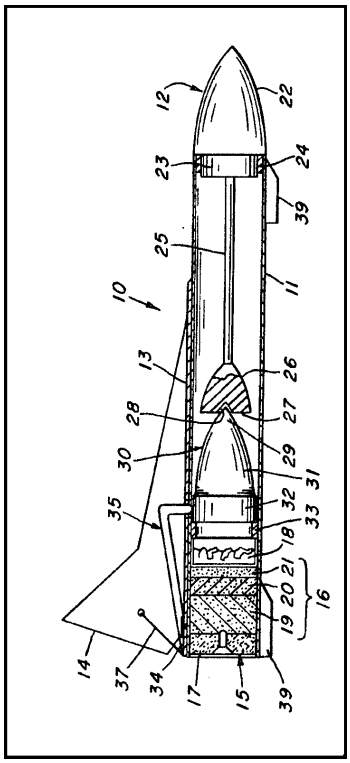




Walt Senoski

Kopter Rockets Patent Drawings





Tales of a Traveling Rocketeer: Red Glare

By George Pike

The twice-yearly Red Glare launches have become the premier regional launches in the mid-Atlantic region, maybe in the entire eastern U.S. The 3-day launches are conducted in the spring and fall and are worth experiencing at least once to see the huge, flat field, the size and number of big projects that get launched, and to experience the legendary Road Kill Café—you kill it, we grill it!

The launch is sponsored by the Maryland-Delaware Rocketry Association (MDRA), which is unique in that they are a local chapter of NAR, a prefecture of Tripoli, and an independent rocketry club. Because they are independent, they have their own insurance and because of that, Red Glare allows the concurrent launching of rockets with commercial motors as well as rockets with research motors. Anything and everything from Mini-Maxx 1/8A motors up through research "P" motors may show up and fly.

The field is well worth the trip alone. The Higgs farm is large, flat and mostly treeless. It's a roughly triangular shaped collection of fields with a minimum of ¾ miles from the range head to the major tree lines. (The exception is "Sullivan's woods" a small patch of trees about 300 yards away, but not in the direction of the normal winds). MDRA flies year-round, from November through April at the Higgs farm, then transitioning to a smaller nearby sod farm for the summer months. The Red Glare launches are their big events.

Red Glare runs from Friday through Sunday, with both commercial and research flying all three days. Last April, the Pike boys (George, Jeremy and Benjamin) traveled to the Higgs Farm outside of Price, Maryland for Red Glare 12. We arrived late Thursday and stayed at a local motel, then got to the field about 8:30 Friday morning. Friday is a great day to fly as the launch isn't too crowded and some of the big projects get prepped and ready. The boys and I each were able to get 5 or 6 rockets into the air, from Benjamin's Estes "A" powered "Pizza Rocket", through Jeremy's "F" powered "Outlaw Pete" to George's L1187 research motor powered "$88.13." Saturday has become a great day for rocket and people watching as it seems like half the eastern seaboard comes down to fly or watch rockets. The highlight flight of the day, however, was a 1/6 scale Mercury Redstone that flew perfectly on a cluster with an "N" central and several "K" and L" outboards. Sunday was more like Friday, with smaller crowds, but a number of great flights. Because of school commitments, both boys were unable to come to Red Glare 13, held in mid-November, but George went out and flew his new "Mummer's Dance" twice, once on a research L motor and next on an M.

Red Glare has several contests (not competitions in the NAR sense) including their "Mach Madness" speed contests, a "Mile-High" contest, and a "Pick-your-own (altitude)" contest, plus a lively raffle featuring several prizes. Prizes are donated by one of the several vendors onsite, and proceeds go to charity. Red Glare and MDRA have a great history of supporting local charities, including the Susan Kolman Foundation for Breast Cancer (fly Pink!) and local veterans organizations. Vendors included full-service rocket suppliers Performance Hobbies, Wildman Rocketry, and Red Arrow Hobbies, kit manufacturers Dr. Zooch and FlisKits, plus Animal Motor Works, TruCore/Brand X rocket motors, and others. Onsite food services are provided by the legendary Road Kill Café. This is landowner Tommy Higgs and family with a huge barbeque and the best grilled chicken in the mid-Atlantic region.

Red Glare is an easy 5 hour drive from Pittsburgh, past Baltimore/DC, and over the Bay Bridge (like you're heading toward Ocean City). Motels are available in Kent Narrows, Grasonville and Denton, MD, about 15 to 20 miles from the field.

Red Glare 14 will be this spring, probably in mid April and the Pike boys will again be in attendance, this time towing a rented rocket trailer so that George can bring out his big dog: A 60% scale Nike Smoke, 12' tall, 10" in diameter and 90 lb, flying on a research N motor. The boys are also hard at working building newer and bigger projects to fly. Come and join us! Scheduling and additional information will be on MDRA's website at www.mdrocketry.org

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NARAM-55
THE CONTEST EVENTS
Part 2

by Steve Foster

Happy New Year Everyone! I hope you all got plenty of good eats, good treats and plenty of quality time with friends and family over the holiday season. Ok, now that we have that out of the way it's time to tackle your New Year's resolutions head on. By the time you get this you have probably already realized you are not very good at keeping those classic resolutions and you've already skipped a few steps with your promises to get fit; lose some weight; get more organized; quit smoking and get control of your financial situation – heck, how can you do that with all the credit card bills filling up your mailbox. But there is one resolution you still have time to get to; open up the rocket workshop and build those NARAM models while the snow is still on the ground – you know you have more time now than after the grass starts growing again! Well, it's at least a plan we can dream of anyways; we will of course all be scrambling to finish up several models just in time to pack up the car this coming July. But let's all get started with step one in the process and start to think a little more seriously about the models we will need to build later this summer.

For Part 2 in my series on competition models I will try to tackle some topics and tips for the altitude events being held during NARAM-55 in Aurora, Ohio. We have 3 altitude events that will all be tracked with theodolites (no altimeters this year); these events are 1/2A Altitude, A Payload Altitude and C Dual Eggloft Altitude. I thought that perhaps the best way to start on these events is to cover them all in a sort of "frequently asked questions" and then perhaps get into each separate event later in this article. So let's think of this first section in some general terms for all the altitude events.

How Is The Competition Scored?

Highest altitude on a single flight wins.

How Many Flights Can I Make?

You can make up to two tracked flights for each event and you can use a different model for each of these flights. You will have to return the payload and egg models (eggs fully intact), but no return is required for the 1/2A Altitude event. Keep in mind that if your model isn't tracked you may keep flying until you've reached the two tracked flight limit – as long as each flight is qualified and made a safe recovery.

What Will Disqualify My Entry?

Your entry will be disqualified if it flips or loops and does not fly straight. Your entry may also be disqualified if it doesn't recover in a safe manner or the payload doesn't stay secure in your model, and for the egg lofting event if the eggs are cracked or broken during the flight or recovery process.

What Is The Best Fin Shape For My Altitude Models?

I've seen various contestants use almost every common fin shape and been successful so I've wondered about this item myself many times but never looked into deep enough until I thought I should try to answer this question for others in this article. I was able to dig up this article by Tim Van Milligan in his Apogee Components Technical Publication#16; his answer is a little surprising to me – it's a simple rectangle or the parallelogram; but you should read Tim's article to find out why!

How Else Can I Reduce Drag On My Model So It Will Fly Higher?

1) Keep it simple - drag is your enemy. You will want to fly each event at the smallest possible diameter for the motor class.

2) Very smooooooth surfaces with as few joints as possible and with those joints located as far down the model as you can in the design, you want to keep the air flowing smoothly over the model, and any disruption in the air flow will cause it to become turbulent.

Isn't Weight A Big Factor As Well?

1) Yes, extra weight is another enemy. The more fillers and paint your use, the more your rocket will weigh, so some balance is needed, try to get the finish as smooth as possible before you start into the painting process.

2) Also find the optimal weight of your model using a scale that is accurate to at least 0.05 ounce or 0.1 gram. Weigh before a few test flights, if possible, before the big contest.

Should I Use A Piston Launcher And A Tower?

YES! Use a piston launcher and a tower launcher or pop-lug to reduce drag by eliminating the drag the launch lug will add. If you need some info about getting started using pistons, you can get a piston kit from Qualified Competition Rockets .

Ok, this should be enough info to get you thinking about finish, fin shapes, improving the launch set-up, etc. Now let's look at each event separately for those final few tips. Oops, I forgot the single most important overall tip = Tracking Powder! Use it! You will need

your model to be seen by those operating the theodolites; tracking powder is usually line chalk carpenters use, dry powdered paint or epoxy pigment. You can make the powder lighter by mixing it with baby powder or micro-balloons. Now we can move onto each event.

1/2A Altitude: The most basic event of the three – a smooth finish will go a long way. Without getting into some high-tech laminar air flow shapes it's best to stick to minimum diameter models – in this case 13mm motors are required and thus most all models will be based on using BT-5 tubing. You can save some a slight bit in the diameter by making your own fiberglass tubing. Also consider a rear ejection or perhaps a separation point just above the fin can – by getting rid of the nose cone separation point, the flow of air around the model will stay less turbulent longer and thus reduce the overall drag of your model. The key will be to do this and also get a reliable recovery and tracking cloud produced at the same time. The optimal mass for this event may actually have you adding just a little bit of weight (perhaps just in the form of more tracking powder), if you get a chance to do any testing, experiment with various overall weight and see what works best.

A Payload Altitude: Very similar tips for the 1/2A event except that you will have to carry a payload device (see rules for specifications). The payload is far heavier than any weight that you would consider to reach optimal weight, so it's even more advantageous to build light. Again if you can make your model with the first separation point below the payload section you will gain an advantage – you will also need to be able to remove the payload post-flight for inspection – I use a Kevlar cord with a knot above the payload to pull the payload out of the bottom of this section. Also since the payload will move the center of gravity forward, you can reduce the size of the fins on these models which will gain you some drag reduction.

C Dual Eggloft Altitude: This event will come down to two key items: your launch rail/tower set-up and the amount of risk you take protecting the eggs with a low drag capsule. If your model does not leave the rail/tower almost perfectly straight precious altitude will be lost as it heads down after arching past altitude before ejection. Although I believe a piston will be necessary to place in each of this year's altitude events, it's almost going to be a requirement to even get a fair qualifying flight in this event. Whether you fly an egg on a stick (minimum diameter body tube) or a conical body it will be most important to eliminate any extra weight; this may require taking some risks with the amount of padding or design features you use to carry the eggs.

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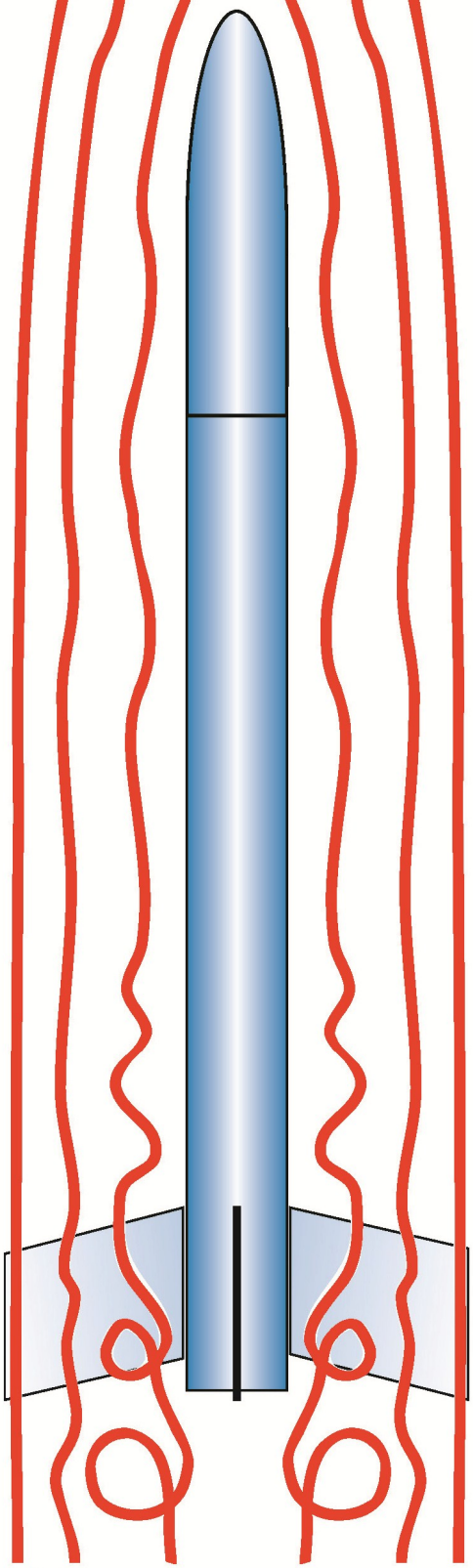

The Airflow over the surface of the rocket becomes more turbulent as the rocket travels up through it. Keeping the flow from becoming turbulent longer will reduce the drag is key to sucess in altitude events.

Pittsburgh Space Command
2013 Annual Business Meeting

The annual PSC 473 business meeting was held at 9:00 am on Sunday, December 16th, 2012 at Panera's in the Water Works Mall in Blawnox. In attendance were former club President and current newsletter editor, Art Nestor, Vice President, John Brohm, former club president, Steve Foster, former club president and current section advisor, Rod Schafer, website designer/developer, Mike Hardobey, Scott Alexander, Michala Alexander and current club president, John Pace. Club president, John Pace opened the meeting at 9:05 am. The following outlines items discussed during the meeting:

2013 PSC Launch Calendar – The following launch dates and Hobby Express build sessions/ membership drive dates were recommended and approved for calendar year 2013:

- January 20th (Sports & HP Launch)
- February 17th (Sports & HP launch)
- February 23rd (Hobby Express Builds Session – Cranberry Twp.)
- March 17th (Sports & HP Launch)
- April 6th (Hobby Express Build Session - Cranberry Twp.)
- April 20th & 21st (Possible MTMA Regional Launch – Alternate dates April 13th & 14th)
- May 18th and 19th (Steel City Smoke Trail)
- June 23rd (Sport & HP Launch)
- July 14th (Sport & HP Launch)
- August 18th (R&R, Picnic & Sport Launch) – This launch to be held at Camp Lutherlyn
- September 15th, (Sports & HP Launch)
- October 13th (Sports & HP Launch)
- November 10th (Sports & HP Launch)
- December 15th (Business Planning Meeting – Panera, Water Works Mall, Blawnox)

NOTE: All launches with the exception of the August 18th R&R will be held at Weber Farm. As a reminder, the FAA waiver at Weber Farm is 8700 feet AGL.

Other important rocketry dates identified for the 2013 calendar year include:

- NARCON 2013, Santa Clara, CA – February 22nd – February 24th
- Team America Rocketry Challenge Finals – May 11th (rain date May 12th)
- National Sports Launch, Pueblo, CO – May 25th thru 27th
- NOVAR Regional Competition Launch – June 8th & 9th
- The Plains, VA. ECRM Regional Competition Launch – June 15th and 16th, Mt. Airy, MD
- NARAM 55, Aurora, Ohio, July 20th through July 26th.

There will be three Tripoli Workshops in 2013 as follows: January 19th – Making your own igniters, February (date TBD) – Dual Deployment and March (date TBD) – Fiberglassing. Visit the Tripoli website www.tripoli-pgh.org for more information on these workshops. See exhibit "A" for a summary of the PSC launch schedule for 2013.

Contest Calendar & Events:

Event	Contest Factor	Event Weight
1/4A Helicopter Duration	3	20
A Rocket Glider	3	20
1/8 A Parachute Duration (MR)	3	7
B Streamer Duration (MR)	3	13
Sport Scale	3	20
		80

Steel City Smoke Trail – May 18th & 19th, 2013
ECRM, Mt. Airy, MD – June 15th & 16th, 2013

Event	Contest Factor	Event Weight
Classic Model (No Mission Pts.)	3	20
Set Altitude w/ Altimeter (225m)	3	8
1/4A Helicopter Duration	3	20
B Streamer Duration (MR)	3	13
1/2A Rocket Glider	3	19
		80

Budget Review (Revenue & Expenses): In 2013 approximately thirty-three people paid annual dues for PSC

membership. Twenty-two individuals or families who paid dues in 2011 did not pay dues in 2012 but received the newsletter and other club e-mail correspondence. In total, seventy-one individuals received the newsletter and club correspondence via e-mail. Another seven members receive mailed copies of the newsletter in addition to the hard copies sent to the NAR newsletter judges. 2012 revenue totaled $1168, while 2012 expenses were $1621.28 for a net loss of $456.00. However, due to donations by current PSC members, the PSC treasury ended 2012 with a net surplus of $692.84. Over the last five years certain club members have covered the cost of major capital equipment which over the last five years has totaled roughly $6400.00. In 2013 the club intends to upgrade the launch control system to accommodate high powered launches. We have applied for a $250.00 grant from NAR but will still have to cover the remaining balance of $600.00. For more detailed information on club revenue and expenses please see exhibit "B".

Dues & Expenses: Based upon an in depth review of the clubs current revenue and expenses, and the upcoming capital expenses (upgrade high power launch system to be in compliance with NAR requirements) the following decisions were made concerning dues. Membership dues will be slightly modified with family membership dues increased from $14.00 to $15.00 and individual dues from $6.00 to $8.00. These slight increases do not cover annual club expenses but will help minimize any losses. Since we now have high power capabilities and will be investing roughly $850.00 in new equipment, anyone flying high power will be asked to pay a $10.00 launch fee. In addition, those members receiving the newsletter by mail will be asked to pay an additional annual fee of $10.00. Non-members will be asked to pay an annual fee of $20.00 for mailed newsletter. John Pace will be sending all members from 2011 and 2012 a PSC registration the first week of January. We hope that anyone planning to fly with PSC at Weber farm this year completes their registration form and mails it with a check to Jerry Kraus payable to Pittsburgh Space Command. Jerry's mailing address can be found on the registration form.

Tripoli Pittsburgh: Due to PSC's high power capabilities and a reduction in launch attendance, Tripoli Pittsburgh has modified their launch schedule using a combination of one and two day launches over the calendar year. The only two day launches planned by Tripoli will be in early June and mid September. Since all one day launches will be research launches PSC members can go but the flyer of record will be a Tripoli member due to insurance requirements. All of Tripoli's Saturday launches which will occur during their two day launches are Commercial launches, which means both NAR and Tripoli (national) members and their family members may fly any commercial motor up to their individual certification level. However, fliers who are NOT a member of either rocketry group will be required to have the RSO or another Tripoli member sponsor their flight and will be limited to no more than an Estes "D" motor. When flying at a Tripoli Saturday launch please be sure to bring your NAR membership card. You'll need to show this and also sign a liability waiver. The Tripoli launch schedule for 2013 is as follows: May 4th, June 1st and 2nd, June 30th, July 30th, September 4th and 5th and October 13th. Consult the Tripoli website at www.tripoli-pgh.org for more information.

High Powered Flights at Weber Farm: With the new high power opportunities and 8700' waiver granted to us at Weber Farm, and in the interest of promoting a safe launch environment, PSC will be taking a more disciplined approach to high power flights. PSC will be recommending rail buttons be used on all high power flights ("H" impulse and above). Rail buttons will be a requirement for all level 2 flights. The Center of Gravity (CG) and the Center of Pressure (CP) needs to be shown on all level 2 rockets. The club has a limited set of rod sizes so if you have a rocket with a unique launch lug it will be your responsibility to bring a minimum 6' rod that accommodates your launch lug. All models will be inspected by the RSO prior to any launch. If the RSO does not deem the model to be safe for whatever reason, it will not be allowed to fly. As club officers we are responsible for "**ALL**" safety, not just of those attending the launch, but also of those living in and around Weber farm and their personal property.

Club Goals and Objectives: There were several discussions involving the future of the club. Topics included membership and membership growth, balancing club budget, and succession planning (future club officers). The PSC members in attendance identified several action items we plan and need to focus on over the next two to three years to expand our membership while addressing several of the challenges listed above. Those items include a bigger and better field (completed), membership drives (rocketry build sessions – on going), better advertising in local hobby stores (New generic brochure to be placed at Hobby Express in January), high power launch capabilities at site through level 2 (completed), and to attract more teens and adults to our club, place more emphasis on high powered and sports flying.

Rocket Build Session – Hobby Express, Cranberry Township, PA: In an effort to bring more attention to our hobby with the hopes of growing our membership, PSC

plans to hold a few rocketry build sessions at Hobby Express in the Target/Lowes shopping center off route 228 in Cranberry Township, PA. Rocketry build sessions have been tentatively scheduled for February 23rd and April 26th. These build session typically run from 10 am when the store opens to 3 or 4 pm. We hope that our time spent at Hobby Express will be used to help others build a model rocket they have purchased from the store. After that we give them information about the club, monthly launches and our launch site. When not helping others build a rocket, we use the time to build our own models be they for sports flying or competition. Please keep these dates on your calendar and look for e-mails announcing each build session.

NARAM 55: This year's national rocketry event will be held from July 20th through July 26th in Aurora, Ohio. The Contest Director is Robert Ferrante. The host section is Mantua Township Missile Agency (MTMA, Section 606). Events are 1/8A parachute duration multi-round, 1/4A helicopter duration, 1/2A altitude, A rocket glider duration, A payload altitude, B streamer duration, C dual Eggloft altitude, Scale, R&D. More information will be sent to NAR sections as it becomes available. For current information concerning NARAM 55 visit www.naram.org.

Treasury Status: In Jerry Kraus' absence John Pace reported on the financial status of the club. The treasury balance as of November 30, 2012 stands at $692.84. Financially, the club is in excellent shape. Membership dues are to be paid to Jerry Kraus made payable to Pittsburgh Space Command. Jerry has agreed to remain as club treasurer through calendar year 2013. See exhibit "B" for a more detailed breakdown of club expenses and revenue.

Master Address and E-Mail Listing of PSC Club Members: Our master address and e-mail spreadsheet currently tracks and keeps up to date the contact information for 111 former and current members. There are currently 32 paid PSC members for calendar year 2012.

Website: The group agreed that maintenance and website improvements cannot be handled by one individual but must be a multi-person effort. All those in attendance also agreed that all launch date, build session and flying field information must be kept current and available to all members and non members well ahead of each launch. Mike Hardobey, Scott Alexander, Michala Alexander and John Brohm agreed to take on the task of reviewing our website updating it as they see fit. Some of the objectives of their review will include: 1) A better understanding our website structure, 2) Making the website compatible with laptop and most mobile devices, 3) Move website support away from Network Solutions to someone else like pair or Go Daddy to reduce our annual website expense, 4) consider renewing domain name for as many years as we can afford to pay in an effort to keep cost down, 5) provide individual or group login for PSC members to protect certain club data (ex. Most current newsletter, 6) on line dues payment, 7) a complete on line file of past newsletters in a PDF format, and 8) a possible account with Café Express for PSC wearables and other trinkets. Other ideas for the website are more and better launch photos, update members list, a contest results section, and a more up to date history of the Pittsburgh Space Command. The ultimate goal is to make our site an excellent channel for communication of information about our hobby where the data can be easily transferred and stored.

PSC Newsletter: This past year PSC successfully made the transition from a postal mailing of the newsletter to an electronically delivered PDF version of the newsletter, to those members that provided the club with a current e-mail address. Art Nestor sends the completed newsletter to John Brohm. John converts Art's file to PDF and sends it to Steve Foster and John Pace for distribution to our membership. If you prefer a hard copy of the newsletter you're to e-mail Steve Foster at stevef63@windstream.net. Steve will also continue to make a few copies of the newsletter for Art's use, occasionally our archives and the newsletter judges. As outlined in last years business planning meeting, there will be a fee of $10 for hard copies of the newsletter requested by PSC members and $20 for non-members.

PSC has won the coveted NAR newsletter award for the past two years and is hoping to make it three in a row. However, to achieve this, we're going to need the support of all PSC members. We'd like to see members, young and old, contribute at least one article to the club. The articles need be only a few paragraphs or if possible a full page in Microsoft Word. You can talk about anything pertaining to the hobby of model rocketry. Your favorite kit, a model rocket review, or when your interest in model rocketry began. If you're a Born Again Rocketeer, why did you re-enter the hobby? What's your favorite model and why? What do you like most about model rocketry and what do you like the least? Or anything about model rocketry that interests you. For you adults, share some of your memorable moments when you were a kid or with your own children. Also, if you have a unique technique that you use in constructing your model rocket, a unique rocket design you'd like to share with the members or some new materials you've come across to make your model look or perform better, be sure to share those ideas with the club. The current newsletter is

roughly sixteen (16) pages long. Our goal is to maintain that number of pages throughout 2013. As editor, Art Nestor puts a lot of effort into developing our newsletter. In appreciation for his efforts let's all contribute to this worthy cause so we can bring back the newsletter of the year award to Art and PSC. All articles should be sent to Art Nestor at artpeg@hotmail.com.

Club Printer: The club purchased a new printer in the first quarter of 2012. All technical glitches have been overcome and the printer is functioning properly.

Equipment Needs: As stated earlier PSC will be purchasing new high power launch control equipment. PSC has applied for a $250 NAR grant that will help reduce the expense to the club to approximately $600.00. It is hoped the new high power launch control will first and foremost bring us in compliance with NAR high power launches, attract new members, and reenergize the current membership encouraging them to attend more launches in 2013.

Club Officers: All club officers have agreed to keep their positions for calendar year 2013.

Section Advisors Update: Rod Schafer reported that he will be filing for our Charter and NAR field insurance soon.

Camp Lutherlyn Donation: The membership approved a $50 donation to Camp Lutherlyn in 2013 for allowing us to use their pavilion, grills and restroom facilities during our August 18th R&R sport launch. Jerry Kraus to issue a check to Camp Lutherlyn in this amount and mail it to their offices.

The meeting adjourned at 12:30 pm, followed by a brief discussion of NARAM-55 events and suggested model designs.

John Pace
President
Pittsburgh Space Command
PSC 473

New Member Introductions

Mark and Matthew Politeski

We recently moved to the Pittsburgh area from Ontario, Canada, and have been interested in finding an extracurricular activity that my son Matthew (11 years old) and I, Mark, could join. As you may not be aware, I work for John Brohm and after a meeting one day I noticed his pictures of a rocket launch in his office. He invited my son and I to a launch if we were interested, which I thought would be fun for us to try. Not knowing, John invited us to his house one evening for dinner and to actually build our own rockets so that we had something to launch. That was the start of the interest. We learnt many aspects of rocketry, everything from kit building (not necessarily following all the instructions) to custom builds. We also witnessed the vast collection of rockets John has as well as his impressive work shop. The day of the launch was great. We saw so many different variations on rockets. It was also comforting to know that not all rocket launches are successful, including the landing. Matthew and I could see how it was so addicting and our conversation on the drive home was all about how cool the day was and how we wanted to come back. Since writing this article, we had been invited back to a second launch which was as good as the first, and have since joined the Club. We have also visited the recommended hobby store [Hobby Express – Ed.] to help build the addiction, which did exactly that. We purchased a couple of additional rockets and accessories to begin our own collection. Our next adventure will be to try our talent at painting our rockets to get that custom look like so many of the club member's rockets. We greatly appreciate John's invitation, and look forward to continued event filled launches.

PSC Shop Talk

Old 54
A Level 1 Rocket: Part III
Adding an Altimeter Bay

By John Brohm - NAR #78048

This installment of PSC Shop Talk marks somewhat of a milestone for the column. PSC Shop Talk has managed to find its way into its tenth year of publication, and this article is #40 in the series. I have genuinely appreciated the opportunity to make a contribution to this great hobby by way of Team Pittsburgh and I hope that at times the ideas, methods, and techniques that I've shared with you have been of help in some small way. Certainly the column has been a fun and creative outlet for me, and so long as our Award Winning Editor will have me, I'll continue to share my project thoughts and techniques in Team Pittsburgh for as long as circumstances permit.

Which brings us to a current subject of mine, Old 54. As told in earlier construction articles here in PSC Shop Talk, Old 54 (my Level 1 certification rocket) turned out to be one of the most rewarding projects I've taken on in some time. I think having a goal in mind for the ship, as well as a theme to build around, set the stage for a very satisfying project. There's a lot of "me" in that particular rocket, and I'm hoping that Old 54 will remain in good condition for years to come now that her certification flight has been successfully completed. I suppose I'm hoping the same thing for myself!

One of the features for Old 54 that I had decided upon early in the design phase was to provide for the inclusion of an altimeter bay. Having considered the plethora of altimeter options out there I ended up going with the PerfectFlite APRA, a compact but reasonably precise device, and certainly of a size that would easily fit in a LOC/Precision Altimeter Bay. Photo 1 shows the APRA; Photo 2 lays out the contents of the LOC altimeter bay kit.

Photo 1: PerfectFlite APRA Altimeter

Photo 2: LOC Altimeter Bay Kit

The LOC Altimeter Bay kit includes a mounting sled for the altimeter as well as the essential hardware for assembling the bay.

Now assembling and installing the altimeter in the payload bay is fairly straightforward, especially if one chooses to follow the LOC-provided instructions. But I had decided I wanted a convenient way to turn the altimeter on at the pad; the alternative would be to jumper it on before installing the sled into the Bay, and who knows

how long the device would be left on before the flight was actually launched? Not so great for the battery. So it seemed that provisions for an on/off switch were needed.

The easiest way to mount the switch is to install it on the outside of the of the rocket payload bay, and indeed many rocketeers do it precisely this way. But I wanted a cleaner look, and that meant mounting the switch inside the bay. To access the switch, I planned to use a small diameter screwdriver that would fit through one of the payload bay portholes, one which would be lined up with the switch on the inside.

But I also needed to decide on the type of switch. There's all kinds of low voltage instrumentation switches out there, ranging from the economical assortment one can find at Radio Shack to the more rugged IP-graded sealed switches that the Defense and other mission-critical industries use. But the issue here isn't so much the robustness or sexiness of the switch; it's about the physics.

At launch time one usually has the rocket sitting at the pad, pointy end up. The thrust vector of the motor is fully coincident with the longitudinal axis of the rocket. A switch aligned with that thrust vector would experience quite a significant G-force, and that jolt could bounce the internal contacts of the switch, leading to a corrupted functioning of the altimeter. We want an arrangement that will be unaffected by the imparted force, and a good way to achieve this is by using a switch with rotary contacts and placed perpendicular to the thrust vector.

Just such a switch is available from Aerocon Systems (http://aeroconsystems.com) for just a few dollars (which also happens to meet our economical requirement), and that's the type of switch I chose, as shown in Photo 3.

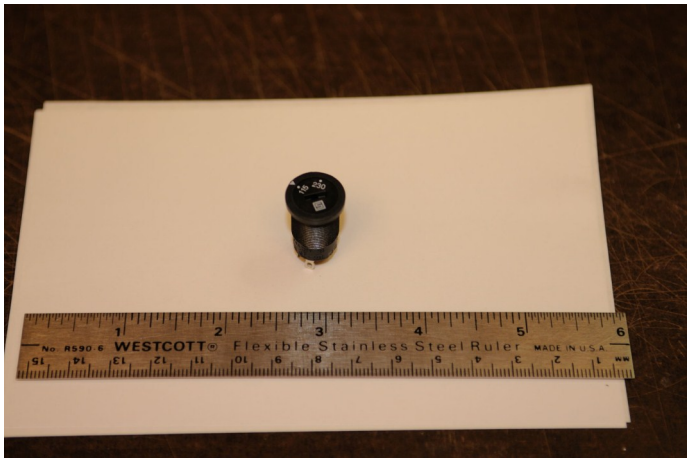

Photo 3: Altimeter Power Switch

This particular switch is intended to be used in conjunction with heavy electrical equipment, and permits the switching of loads between single and two phase power. One can readily wire it in a SPST arrangement which is what our application requires. The switch has a small slot in the face of it (not so apparent in the photo) which the tip of a small screwdriver readily fits into - the plan is coming together!

The last thing to be engineered is the mount for the switch; since the altimeter sled is mounted inside and at the center of this big 4" diameter bay, we need the switch face close enough to the altimeter porthole so that it can be reached by our little screwdriver. That means we need to fabricate a switch stand, and I did just that starting with a stock sheet of 0.016" aluminum. Photo 4 shows the mount pattern in the process of being cut out of the stock aluminum; Photo 5 shows the completed switch stand folded into shape.

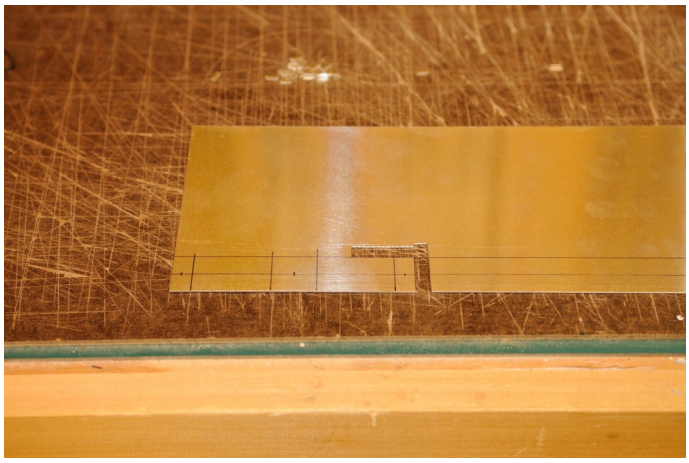

Photo 4: Fabricating the Switch Stand

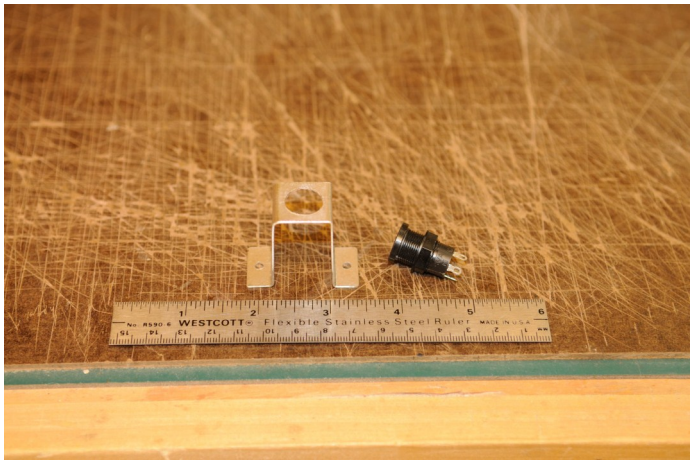

Photo 5: Switch Stand Complete

A quick dry fit showed that some further adjustment was needed; as shown in Photo 6, a clearance notch was required to accommodate the eyebolt nut on the right. You can also see that I added some rubber grommets at each end of the sled to act as shock absorbers.

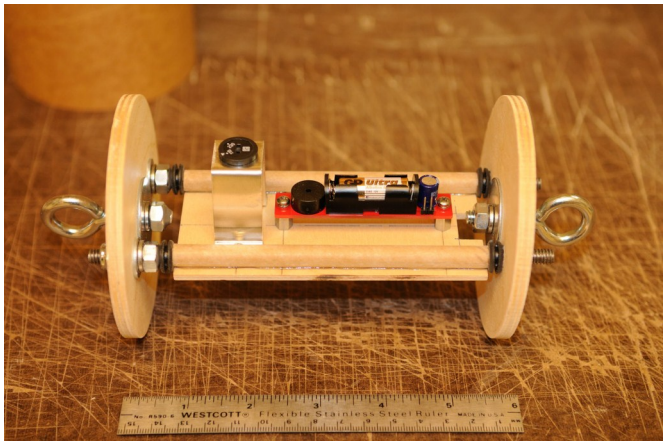

Photo 6: Altimeter Sled Dry Fit

Of course the sled needs to be painted; I doubt that helps its function, but it certainly makes it look nice! Photo 7 shows the finished assembly and the little screwdriver that will be used to turn the altimeter on with at the pad.

Photo 7: Finished Altimeter Payload

Photo 8 shows a quick alignment test; it really helps when things line up!

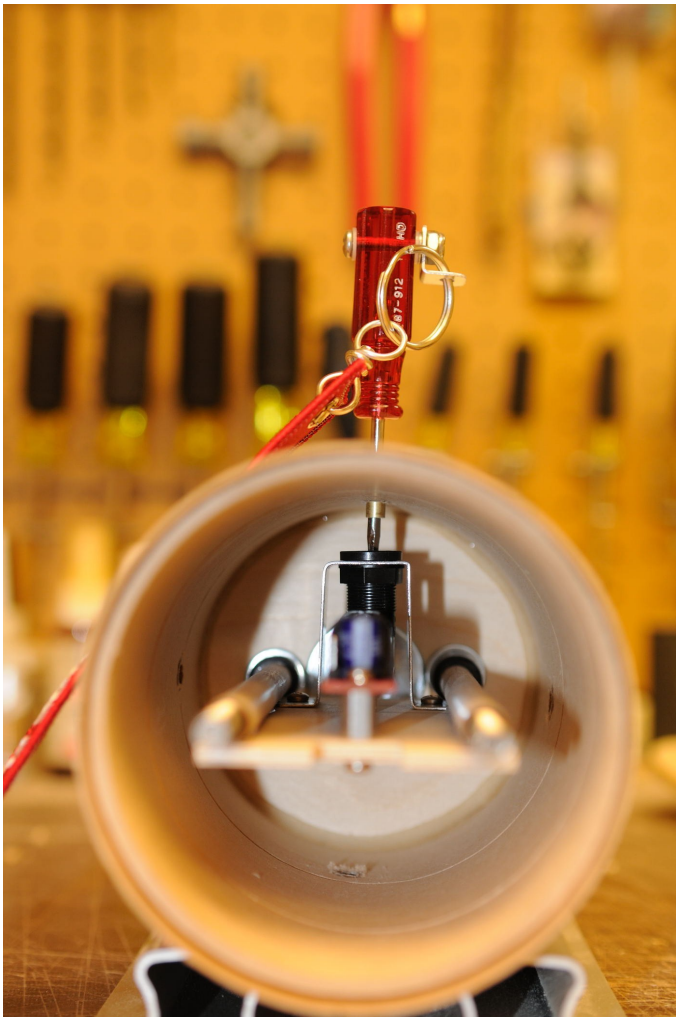

Photo 8: Alignment Test

One last feature I decided to add was a short tube section press-fitted into each altimeter porthole. I cut these from 3/16" OD brass tubing, and the ID is just large enough to permit the head of the switch screwdriver to pass through. The tube's main function is nothing more than to dress the outside finished appearance of the hole, as shown in Photo 9.

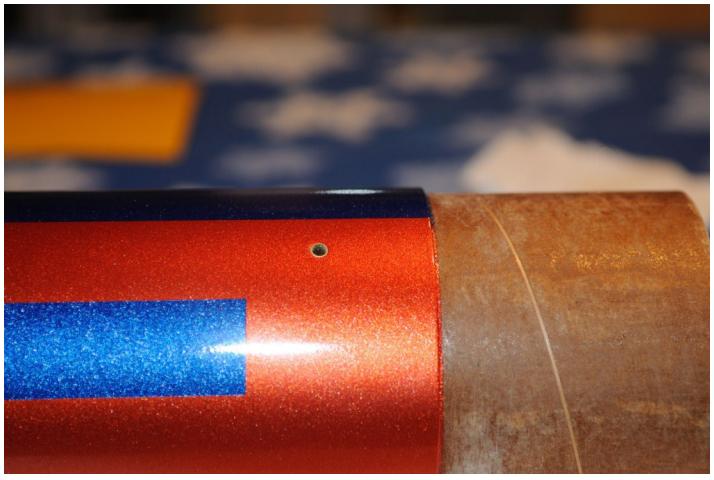

Photo 9: Dressed Altimeter Porthole

We'll wrap up with Photo 10, showing the payload bay ready to be closed in.

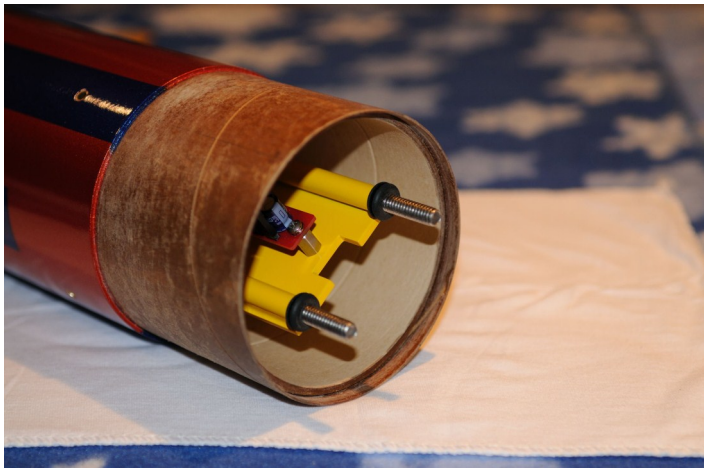

Photo 10: Ready for Closure

And there you have it – an altimeter payload ready to record and report the apogee of Old 54's flights. We'll have to get her back into the air soon to see what she can do!

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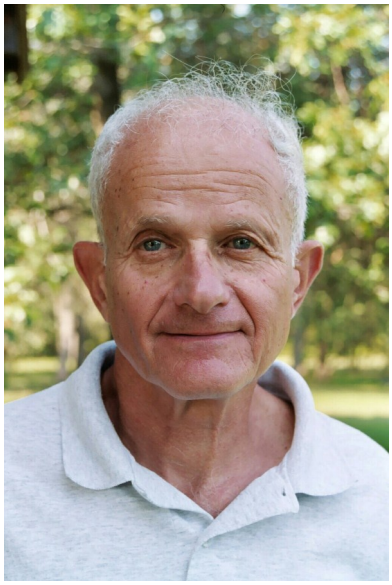
IMPRESSIONS OF THE SPACE SHUTTLE ENDEAVOUR

by Mort Binstock, NAR 27182



I was fortunate over the Thanksgiving holiday to see the Space Shuttle Endeavour now located in the Los Angeles California Science Center. But before presenting my impressions of the Endeavor, I shall first digress to other topics.

I am dictating this article on a brand new computer using its voice recognition software. This software is spooky to watch it type. It works!

Linda and I spent an enjoyable Thanksgiving holiday in Southern California. We walked along the beach. We also rented bicycles which we rode both along the beach and into the desert. Afterwards we spent Thanksgiving with relatives. The four of us visited the Los Angles California Science Center. We saw the Space Shuttle Endeavor and the SR-71 Black Bird. Both were most impressive flying machines

The Space Shuttle Endeavour is located in the California Science Center's Samuel Oschin Air & Space Center. I was totally awed when I walked into the room and laid eyes on the Endeavor. The Endeavour was enormous, much larger than I anticipated. It was supported by four large earthquake absorbing shock mounts. I was able to walk around the space shuttle as well as underneath it. I also saw a special display showcasing a shuttle's engine as well as its tires. The tires were frayed &worn out from the high speed landing.

I was initially disappointed by the shuttle's finish. When I built my Estes Space Shuttle, I carefully spray painted it to achieve a smooth and perfect white finish. The finish on the actual shuttle was quite shopworn. I did not initially expect this shopworn finish, however upon reflecting on the shuttle's considerable use, the finish should be worn. The tiles' coloration was not uniform, the upper white portion unlike my nicely sprayed model, looked like a bad job of wall papering.

Changing my thoughts from the real Space Shuttle's finish to finishing a model, I have seen pictures from contests printed in model airplane magazines where the winning models won in part because they were weathered to look like a specific actual aircraft. Paint was worn through on the wings were the pilot walked to the cockpit, paint near the engine exhaust pipes was blackened to replicate exhaust gas staining, etc.. These models did not have a classic showroom perfect finish.

I think that weathering might be the tie breaker for a win in a scale model event at NARAM. To win documentation photographs would be required showing the real craft's weathering.

I was extremely awed and impressed by the Endeavour. I look forward to flying with you!

Mort

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PSC 2013 LAUNCH WINDOWS - EVENT CALENDAR

Please consult our website at www.PSC473.org for directions to local PSC launches. You may also contact a PSC club officer through the website or obtain a club flyer (with map) at Hobby Express in Cranberry Township or J & C Hobbies in Penn Hills.

Month	Launch Date	Location	Event
January	1/19/13	Joe Pscolka's Shop, Rear 538 Franklin, Cokeburg, PA	Tripoli Workshop Making Igniters
January	1/20/13	Weber Farm – Grove City, PA	Sport & HP Launch
February	TBD	TBD	Tripoli Workshop Dual Deployment
February	2/17/13	Weber Farm – Grove City, PA	Sport & HP Launch
February	2/22/13 – 2/24/13	Santa Clara, CA	NARCON
February	2/23/13	Hobby Express – Cranberry Twp	Membership Drive
March	TBD	TBD	Tripoli Workshop Fiberglassing
March	3/17/12	Weber Farm – Grove City, PA	Sport & HP Launch
April	4/6/13	Hobby Express – Cranberry Twp	Membership Drive
April	4/20/13 & 4/21/13	TBD	Possible MTMA Regional Launch
May	5/11/13	The Plains, VA	Team America Rocketry Challenge
May	5/18/13 & 5/19/13	Weber Farm – Grove City	SCST XIII Regional & Sport/HP Launch
May	5/25/13 – 5/27/13	Pueblo, CO	National Sport Launch
June	6/8/13 & 6/9/13	The Plains, VA	NOVAR Regional Competition Launch
June	6/15/13 & 6/16/13	Mt. Airy, MD	ECRM Regional Competition Launch
June	6/23/13	Weber Farm – Grove City	Sport & HP Launch
July	7/14/13	Weber Farm – Grove City	Sport & HP Launch
July/August	7/20/13 – 7/26/13	Aurora, Ohio	NARAM - 55
August	8/18/13	Camp Lutherlyn – Prospect, PA	R&R XIX Picnic & Sport Launch
September	9/15/13	Weber Farm – Grove City, PA	Sport & HP Launch
October	10/13/13	Weber Farm – Grove City, PA	Sport & HP Launch
November	11/10/13	Weber Farm – Grove City, PA	Sport & HP Launch
December	12/15/13	Panera – Waterworks Mall – Blawnox, PA	PSC 2014 Business Planning Meeting