THE LAUNCH RACK

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National Association of Rocketry Section No. 439
New Jersey's Oldest Model Rocket Club

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***** 2014 LAC NEWSLETTER AWARD HONORABLE MENTION *****
***** 2015 LAC NEWSLETTER AWARD HONORABLE MENTION *****
***** 2016 LAC NEWSLETTER AWARD RECIPIENT *****

President's Message

Arnie Klein

Presidents Report

At the January Launch very few people showed up because of the high wind, and poor ground conditions (all mud), but we did have some interesting rockets launched. There was a group there who were working on doing TARP launches and they had six 3D printed rockets in the shape of a Saturn 5's. Five of the rockets crashed and broke apart due to the brittleness of the plastic, and the sixth one landed high in a tree and could not be recovered. Three of the rockets were low powered and three rockets were launched with an "F" motor. We have had problems getting a full launch schedule from North Branch Park and have only received a few launch dates I do not know what the problem is but we do have launch dated thru March.

-Arnie

Lackey's
The Editor's Pad

Dr. "It's the Trooth" Bob Kreutz

IF it'll FIT – I'll Print IT!
If not, I'll probably print it anyway...

Welcome to the March issue of the GSSS Launch Rack. A single months issue to make room for the "extra" issue you can receive next month if your membership details are up to date. If you haven't renewed yet, do it now, if you're not paid up, I can guarantee you will miss out come April 1st. So are the holy words from my bosses, the powers that be.

Continuing in our tradition and attempts to bring readers NRC competition modeling tips and techniques, you will find in this issue under 4Techno-Files: a review of the the Apogee Mini-Copter for 1/4A Helicopter Duration. Tim Van Milligan has graciously given permission to reprint some of the information on the Mini Copter from the Apogee website.

In addition, other techno-related articles include information on making or preparing ***real ignitors,*** after the plethora of complaints on-line about Estes new non-pyrotechnic "Starters." What it comes down to is this: If you want reliable ignition – make your own! Hey! With all the techno floating around this issue, you can just about hear that pounding beat and Moog synthesizer – can't you? <G>

I figure few read this far into the Lackey's Pad, so what the heck. I'll just admit all this: Yes. As many have pointed out, it is more than just apparent that I have a personal vendetta against our newly re-elected Senator Robert Menendez (D-NJ). Why don't you? After all, He was the One that pointed out Model Rocketeers were all terrorists since we all fly "rockets" - those he believed downed TWA Flight 800 off the south coast of Long Island. The NTSB found that the cause of the crash of Flight 800 was an explosion of flammable fuel/air vapors in a fuel tank, most likely from a short-circuit. But, not before Menendez was able to shut down hobbyist activities in NJ and lay claim to having protected our shores. What utter BS. What is simply amazing and confusing me is: why a guy indited for taking bribes and having sex with under aged human-trafficked prostitutes in Puerto Rico could get re-elected. At least we know he's true to form: only 10 days after being re-installed, Menendez needed "a break" and took a weekend jaunt back to the beach. Where? In Puerto Rico and on our dime.

I saw this once before when Marion Barry was re-elected Mayor of Washington DC. After being released from jail for soliciting and participating in a crack cocaine buy, he too was reelected. It just confounds me. It has me wondering why my formerly wonderful State of New Jersey decayed and what has it become? And who are the imbeciles that have allowed this to happen? Well, I'm left with those we have chosen to "protect" us, which clearly hasn't happened: Menendez at the front of the list. Evil incarnate. Those that re-elected him? Idiots. Pawns in the machine. I really hope he reads this. Senator, you are welcome to rebut. But please, none of your political double-speak, just tell us who pulls your strings. BTW, NJ will pay for one more trip to Puerto Rico – just make it one way.

Countdown!

2019

Please **Note**: All Launch Dates are **SATURDAY** *Except* where noted.

Somerset County Parks Commission has sill not finalized permissions for the use of North Branch Park in 2019. That has to have you wondering what they do for folks that wish to use the Park from Jan 1st to some-time-in-March...

Normally, Launches are held the last weekend of the month on Saturdays with some exceptions. – check the GSSS website for any updates or announcements

Projected

March 23 – Sport Launch (2nd BlueMoo & Vernal Equinox Launch)

Our WebMaster Rob Nee says: Check the GSSS Website! If you go to the launch dates page on the new website there is more info. You can add calendar subscriptions to most phones and Google Calendar. If the launch dates change they show up on your phone or in Outlook automatically!

NEW URL --> http://www.gsss.club/launches.php

Its The Monthly Morph!!

Daryl Kleixon-Running the Show, Rick Grimes-Walking Dead

RE:ENLISTMENTS

>>WELCOME<< ((BACK))
ONE & ALL FOR 2019!!!

Ed Fritch 1st RENEWAL for 2019!
You WILL get the April Issue!!!

Please welcome Arron Atkinson our Newest GSSS Member!!!

THE SOAPBOX

STAND UP AND SHOUT!

Shout, shout, let it all out
These are the things I can do without
Come on, I'm talking to You, come on…
Here you can say what you want: So SOUND OFF GSSS – right here - on anything you would like! May similar minds come together - or secret plans be revealed...

IS IT TIME?

TO BURN OUR TIES WITH NORTH BRANCH PARK

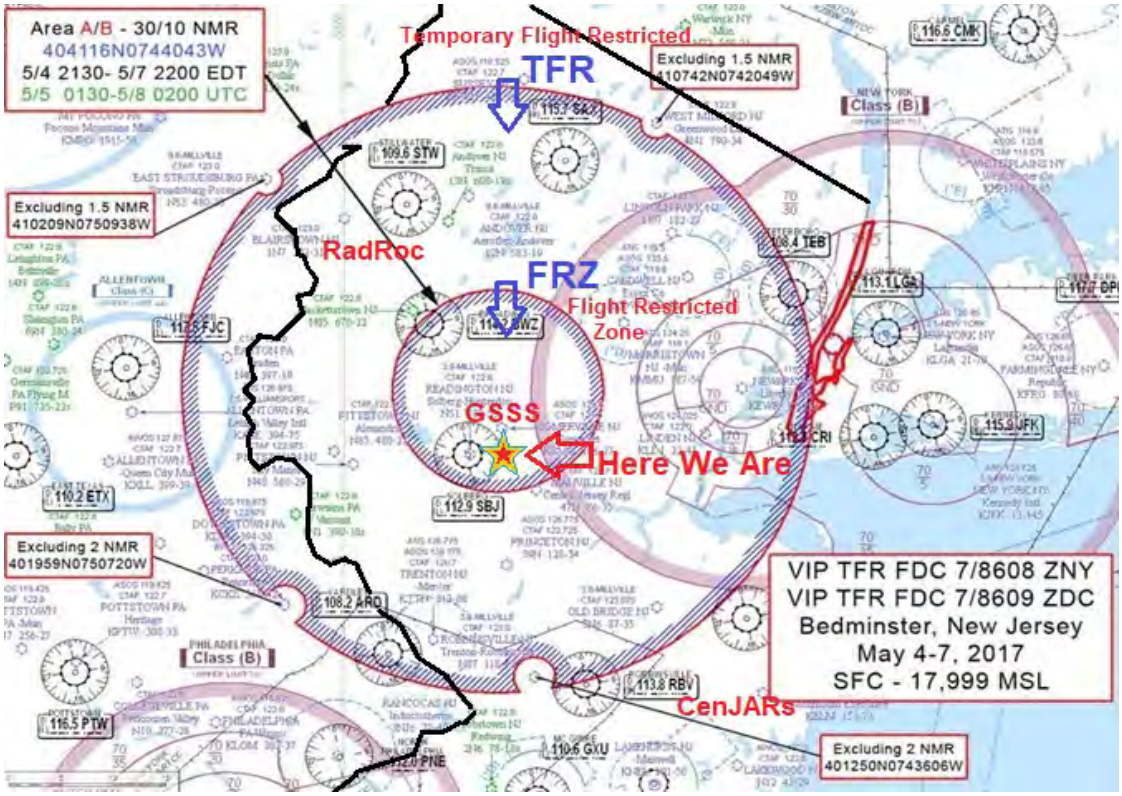
The flaws in the FAI Spacemodeling scale judging protocol are likely to condemn the S5 and S7 events and cause their ultimate demise.

Is it time?

Time to leave North Branch Park and move on to greener pastures? We're gosh-darn, right smack-dab-in-the-middle of the Bedminster Flight Restricted Zone "FRZ." Ok, I'll say it like it is: This SUCKS! Radical Rocketeers have it a bit easier and it looks like CenJARs is totally unaffected. But when the man in charge visits his golf course just north of North Branch, we're just plumb outta luck. Don't even bother showing up because we're in the no fly zone. We do have a choice though. We can put our rocket building on hold until the President leaves office (which could be 6 years) OR move our activity to a different field. Quite possibly, one of the other clubs in NJ would graciously invite us to come fly with them in our time of need? Radical Rocketeers are our closest neighbors, but they too suffer from limited flight schedules out on the fringes of the TFR zone. Which leaves CenJARs in Belmar or SoJARs in Bridgeton, or BARC in Shiloh. PARA and SPAAR are both in PA, but close enough to "fill the need" should they would be willing and if you're willing to travel and have gas money. Of all our neighbors, CenJARS is the closest OUTSIDE the No Fly Zone.

Just like our field at North Branch Park, Radical Rocketeers' field is still within the TFR. When the President is in town – they get shut down too. Although being located in the "outer ring" does give them the option to apply for a waiver, few are granted through the main office in Newark. It might even be better applying to the Federal Offices in DC or asking the President himself! HA! So what do you say CenJARs? Could you fit 2 more clubs on your field? BTW GSSS, are you aware of the 3 mile TFR that goes into effect for the Vice President, Congress – and their WIVES? Of course that's ridiculous, but so is the rest of this nonsense. The situation that has caused the cancellation of 7 of our 12 scheduled launches for 2018. That's Over HALF!!! (ok, ok, weather played a factor too...) Neither of which did we have any control over. So, what's your opinion???

There could be a number of solutions to our no-fly cancellations. But PLEASE, if you have ideas, send them in – communicate those ideas to the GSSS Board. The 2019 flying year is at our doorstep. Possibly asking North Branch for alternate "rain dates" could be considered, but I seriously doubt they would consider that. Which means rescheduling TFR canceled launches to a future weekend at some other field. Not a simple or savory concoction. However, securing a temporary alternate field could be paramount to our continued ability to fly models rockets.



FROM THE OTHER SIDE OF A BROKEN SOAPBOX

Stuart Lodge: A Response to Recent Opinion

FROM THE OTHER SIDE OF A BROKEN SOAPBOX

The Launch Rack recently ran 2 "SoapBox" OpEds (Opinion Editorials) highlighting a few (admittedly opinionated) problems some folks have with the FAI. Stuart Lodge, a periodic contributor to the Launch Rack, and an FAI Scale Judge himself – responds, with the frankness he is famous for.

It is vital that the Chairman of the S7-Scale Judging Team at a Major Championships, or World Cup event, ensures that scale models being checked in for flight, with the usual questions like " How many, motors, stages, parachutes, streamers? + Special Effects – what are they?" Also, that the model is the same as the one statically judged in the hall. In S5-Scale Altitude, processing of eAltimeters is 'taken for granted' as they produce more consistent scores than visual tracking of coloured smoke. But all personnel chosen must be responsible and trained in their use and record keeping.

Naturally, I wasn't at the 2018 WSMC, in Poland, but appreciate your feelings. Vitally, if the Judges are biased, all the 'technical stuff' like Originality, goes out of the window. No names, no pack drill, but looking at the Judges in Poland, I rate two of these highly, for technical observation and integrity, the other three, less so. World Cups like Ljubljana…you'd love it! But just remember that S5-Scale Altitude isn't flown at this, or other World Cup events.

The 'Originality rule' was always going to be controversial. Space Modelling is unique, contrasting with other AERO Modelling FAI-CIAM F-classes. In the latter the 'existing winners' dominate any 'Rules changes' and as a result, few changes occur and… participation has been in decline for decades and now at an all-time low. Space Modelling has forged onwards with evolution, across the spectrum of contest classes and participation at an all-time high. 'Originality' is opposed by existing winners – for obvious reasons – but has resulted in World Cup entry levels at an all-time high. My observations as a Judge may be of interest, if the builder of a 'good' Ariane, Saturn, Soyuz etc, delivers on the field with a good flight, the overall score will always prevail over a simpler, 'Original' prototype. There is a view that 'Originality' should feature in Class 2 World Cup events, but not in Class 1 World & Continental Championships.

It's at times like this, the late Vladimir Minakov's contribution to Space Modelling's scale classes is really appreciated! We're moving in the opposite direction now and it's becoming harder to obtain data on 'western rockets' for reasons of Security. For me, I would abolish detailed measuring in the judging hall of S5-Scale Altitude – reducing this to Length and Diameter – if for no other reason than to make life easier for the judges, there are just so many models at Major Champs. And yes, remember that S5-Scale Altitude is a 'performance class', so it's inevitable that certain prototypes will find their way to the top of the pile…MM-06m Dart is sliding towards the Bumper WAC! Some might say that S5-Scale Altitude has passed its way-point and should be phased out…very few fly it, other than the folk you see at the Worlds.

Subjective – qualitative – ranking, leaves the door open for Judges who are prone to bias, across the spectrum of Sports. Some characters are more liable to be channeled by contemporaries, or even event organizers. And some nations are naturally 'paired' and help each other. FAI-CIAM Judges' Selection Committee?!? ..just remember that any likely members of this will have their preferences. I'm of the view that it'd be no better than the situation we have now. But I've no better solution.

Those are 'my thoughts' and hope they are not too negative. Yes, I do support the 'Originality rule' in classes S5-Scale Altitude and S7-Scale…but whether it should apply in World & European Championships is open to debate. What's vital is that we continue intercontinental interaction and keep things going in the right direction. Judges...some people are just not suitable, even those with high technical abilities. Just remember, Space Modellers aren't queuing up to fill this role – in 2009, I was the least qualified person in the Serbian European Champs Scale Judges' panel. The Poles (and others..) Some may not like 'my style' 'don't like me' because I work on precedent and 'do my own thing', when static judging.

Anyway, I trust these words are helpful in your discussions with your contemporaries and upcoming The Launch Rack issues. I will contribute further to any other issues, if you think I can be of help. Best wishes for now.

ROCKET EMAIL

Send your Rocket eMail to me here:
orbitboybob@comcast.net and I'll do the rest!
...and Remember! The Postage(?) is - FREE!

Dear Dr Bob,
JUST finished watching/listening to the New year's Day Concert from Vienna. Thanks for the latest The Launch Rack...you've presented my Letovice piece brilliantly, can't claim I've read the rest yet. Have a super 2019 and hopefully we'll see each other somewhere.
sincerely....stuart

Stuart:
Thank You – but you did the work and the writing. All I do is put it in big enough print that the Editor Most High can see! <G> And thank you for your response to our last Opinionated Editorial (OpEd)!
DrB

Dr Bob!
Good issue. I have a few dental questions for you...
Thanks! KJ

KJ:
Oh Good Lord, will it ever end? <G> Sure, what Dental Plan do you have? What's the number? Ask away, I'll do the rest...
DrB

DrB
Yours is truly a great rag. Oh boy, hope you can get your head through the door now. – Anon

Anon:
If I'm ever in front of you in a line, feel free to push hard to get me through the door. You hereby have the Grand Editor's permission to post our "rag" for one more year. DrB

Messages Channeled through the Oui-GSSS Board

The GSSS BOARD will discuss matters that relate to the Club and affect the membership. A synopsis and the results of any votes will be presented here.

...Or "Stuff We've Heard That's Been Floating Around In Empty Space

SHEEEE'S BAA-aack!

Yup, our *#1 Launch Rack Reader* and Author, Mr. Stephen DeArman has posted the release of **REFLECTION** the 4th book in the Rocket Babe series:.

Quickly approaching prolific proportions as an Author (not the Rocket Babe herself., but close..) the 'Babe' is back again.

You can get your own copy (autographed if you wish) from the DearMan, himself! With any luck at all, you all got that subtle pun, or else I'll have to hit spell check next time...

Flis™ KITS Inc.

FlisKits Inc. - The RETURN!

Well, papers have been signed, so I can proudly announce that FlisKits has a new home! The materials, inventory, trademarks and all kit documents and designs are being acquired by Ray DiPoala and Eric Henderson!

I am thrilled to know our product line will continue and will do my best in the coming months and years to help Ray and Eric get the most out of their investment! Keep watch for an announcement for Ray and Eric in the coming weeks!

Thank you all, again, for your support and good wishes over the years. Time to get excited again! **Jim Flis**

SORRY: JACKSON HOBBY NOW CLOSED

B.A.R.C.

Monthly Launch

https://www.google.com/maps/place/Rabbit+Hill+Farms/@39.4575101,-75.2776996,12.83z/data=!4m53m41s0x89c73dd300c013e7:0x2d3254bddeb692e9!8m2!3d39.459597!4d-75.290785?hl=en

Date(s) – 03/16/19, 03/30/19, 04/20/19

Time: *9:30 am - 3:00 pm* **Location** Rabbit Hill Farm

Latitude / Longitude: 39.4 6595, -75.291475

Category: Sport Launch

Low, Mid, & High Power Rocket Launches. Monthly launches are typically the third Saturday of each month but are subject to change; please check our website for possible date changes.

Website » http://www.barc775.org/

Sponsor Info:

Sponsor Type: NAR Section

Sponsor: BARC #775

Event Director: Mike Zapolski Sr. | BARC2014@comcast.net | 856-455-7855

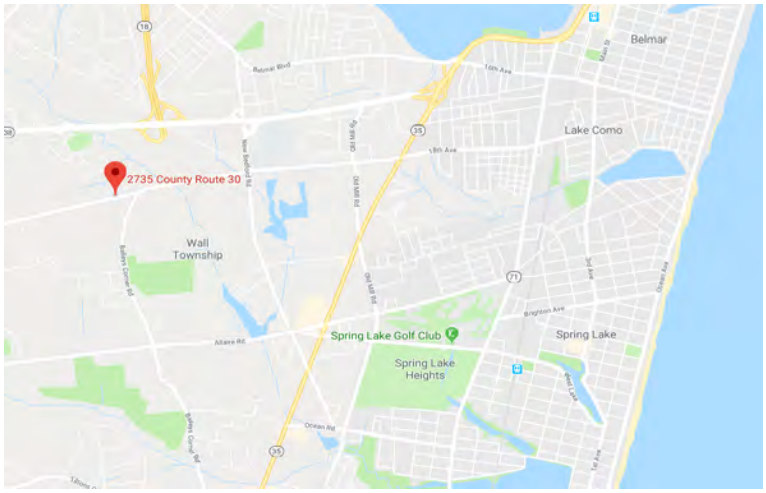
CENJARS

Monthly Launch

Belmar, NJ - 12:30pm to 3:30pm

I don't have a place on our website (cenjars.org) for launch dates. I will look into doing that. We normally launch on the first Sunday of the month from 12:30 to 3:30 or so. I do post announcements early in the week and also post on our

Facebook page. The next few planned dates will be announced there. Of course, these are all weather dependent.



https://www.google.com/maps/place/2735+18th+Ave,+Wall+Township,+NJ+07719/@40.1610314,-74.0644818,13.92z/data=!4m5!3m4!1s0x89c18779c6ee963f:0xc0a742b83b6cd6c5!8m2!3d40.1650355!4d-74.0764465?hl=en

Philadelphia Area Rocketry Association

WE LAUNCH ON THE FIRST SUNDAY OF EACH MONTH AT THE HALLOWELL FARM IN BEDMINSTER, PA 11AM till 3PM
Setup starts at 10:30. Please lend a hand.

March 3 – April 14 – May 5 – June 2 – July 7

WE PERMIT ROCKETS WITH UP TO A **G80** MOTOR!
ROCKETS MAY WEIGH UP TO **53 OUNCES (3.3 POUNDS)** WITH INSTALLED MOTORS.15 LAUNCHER CAPABILITY.

The PARA flight field is located at Hallowell farm, approximately 9 miles north of Doylestown PA on Route 611. The entrance to the farm is just north of the intersection of Route 611 and Route 113. Enter here and follow the road to the right, around the barn. Once around the barn, follow the road and you will be able to see where we are set up. The address of the property is 7554 Easton Road, Ottsville, PA 18942. Please drive only on the farm roads. DO NOT drive on anything green!

To keep down the dust, speed limit at the farm is 5MPH.

We will be launching in a corn field. As it gets later in the growing season you may want to put a beeper on your rockets to help find them in the higher crops. It's a good idea to wear rugged shoes or boots and long pants. There are no rest room facilities on the property but there are plenty of trees, so... Anything you may need - bring with you, including water.

SAFETY IS OF UTMOST IMPORTANCE !!

You will be provided with flight cards which must be filled out before each flight to help us record the days launches. If you would like to save some time at the launch, you can download the flight cards as a PDF file. This will help us with preflight inspections, maintaining as high a level of safety as possible for you. All rockets must undergo a safety inspection prior to being loaded on the launch pad. If your launch card is not signed off by the RSO, the LCO will not launch it.

Website: http://www.sojars.org/

SoJARS (NRC) Sojourn

The NEW NRC Events for 2018-19 will be:

1/4A-Parachute Duration
1/4A-Helicopter Duration
A-Boost Glider
B Eggloft Duration
B-Payload Altitude-Altimeter
C Egg Altitude-Altimeter

We will have entry forms and results cards along with a thermometer and stop watches. Altitude events fliers -you need to supply your own egg or payload along and an NAR approved Altimeter.

https://www.google.com/maps/search/South+Jersey+South+Jersey+Technology+Park,+Glassboro,+NJ+http:%2F%2Fwww.willyweather.com%2Fnj%2Fgloucester-county%2Fglassboro.html/@39.7102799,-75.1362524,13.35z?hl=en

SoJARs plans on having the same contest events every month at all our upcoming club launches.

March 17th
April 21st
May 19th
June 16th
July 21st
August 18th
September 15th
October 20th

November 17th
December 15th

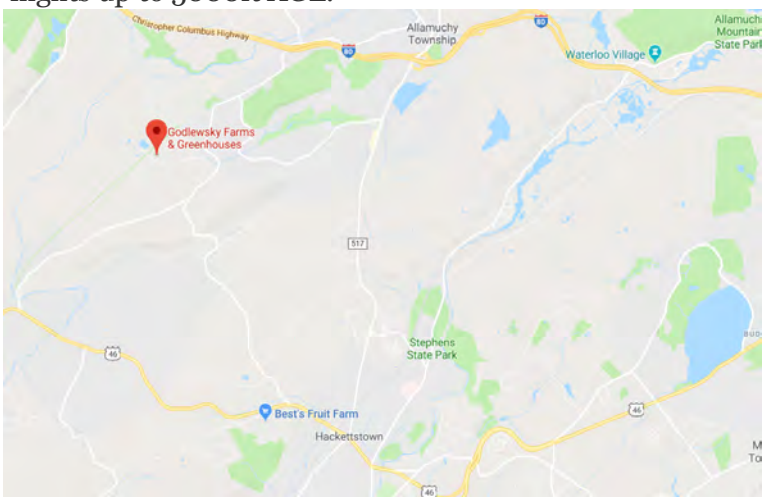
If you have any questions, please contact info@sojars.org

RADICAL ROCKETEERS

MONTHLY CLUB LAUNCHES

The club launches from Godlewsky Farms, located on Alphano Rd in Great Meadows, NJ. This location is just minutes from I-80 Exit 19. Launches are typically held the second Saturday of the month. Stay tuned to the website and forums for updates.

The large recovery area and FAA waiver allow for everything from low power model rockets to high power flights up to 5000ft AGL.

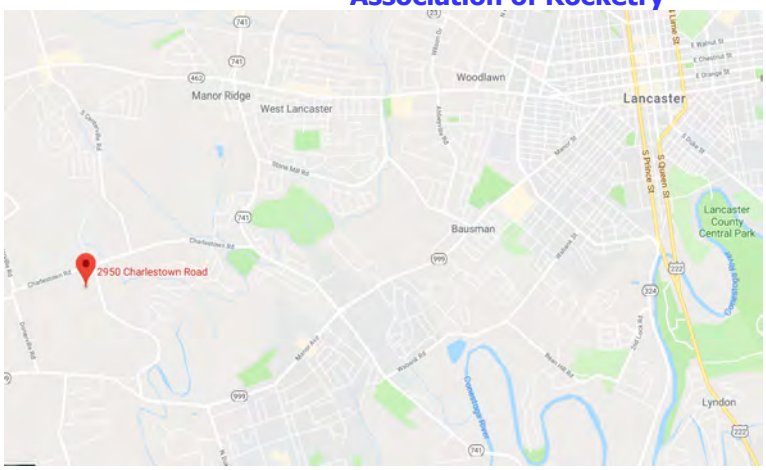


https://www.google.com/maps/place/Godlewsky+Farms+%26+Greenhouses/@40.8862607,-74.873695,12.83z/data=!4m5!3m4!1s0x89c382109ed284af:0x6badbaf16c54cac7!8m2!3d40.9009587!4d-74.8730081?hl=en

Saturday March 9th, 2019
*** stay tuned for additional ***
*** bonus launch dates! ***

S.P.A.A.R.

Southern Pennsylvania Area Association of Rocketry



https://www.google.com/maps/search/Penn+Manor+Middle+School+in+Lancaster,+Pennsylvania/@40.0264301,-76.3671795,13.65z?hl=en

SPAAR conducts regular monthly sport launch activities at our Penn Manor Launch Facility on the grounds of Penn Manor Middle School in Lancaster, Pennsylvania.
Launch equipment consists of an 8 pad launch controller for model rockets and a four pad high power rocket relay system. Up to eight pads can be available for 1/8" to 3/16" rods with four additional pads available for 1/4" rods and up.
Our Penn Manor facility is limited to 160nt-sec of total impulse and models can weigh up the NAR safety code limit of 3.3lbs.

Some launches are held at one of two other facilities Please check the SPAAR calendar for launch locations.

March 3	**1-5**
April 7	**1-5**
May 4	**9-4**
May 25	**9-5**
July 6	**9-5**

http://www.spaar.org/includes/Events.html

N.A.R.H.A.M.S.

ECRM-46 Announced

A Weekend of Contest, NRC, TARC, and Sport Flying

ECRM46 Contest Events:

1/4A Helicopter Duration
B Payload Altitude w/altimeter
A Boost Glider
Plastic Model Conversion
Open Spot Landing

June 15-16, 2019 Old National Pike Park
Mt Airy, Maryland

Contest entry fee is FREE for A/B division, $5 for C/T. Any NAR member can enter Spot Landing and PMC for FREE. Trophies will be awarded to the meet winner in each division only. Only the ECRM event list will be used to tabulate the meet winners (2017 Sporting Code).
You may fly any NRC event of your choice, only the ones listed above are a part of the meet. EGGS ARE NOT BEING PROVIDED. We will have flight cards, a scale for payloads, stop watches & club made payloads. We will also have a Firefly altimeter reader, MicroPeak reader and Adrel PC for altimeter support. Firefly altimeters will be available to borrow with the agreement they are reimbursed for if not returned.

Website: http://narhams.org/calendar_details.html

GSSS Launch Site

North Branch Park

Important note on how launches are run

1. If no one shows up to fly by 10:30am the range will be shut down early.
2. The range will not be opened until other fliers show up to help setup the range.
3. When those present say they are finished launching the range will close.
4. All launching is canceled if Trump is at his golf course in Bedminster, We are not always notified until we get to the park so a launch cancellation notice can not always be sent.

Directions to North Branch Park Launch Site

North Branch Park is very near the traffic circle junction of NJ Routes 22, 28, 202, and 206, near Somerville. Follow 202 South from the circle for 2 miles, past Bridgewater Towne Centre Shopping Mall (Wegmans), under railroad trestle marked "4H is Tops", to right turn onto Milltown Road. Make first left after firehouse and 4H Center on right; follow path to open field. Monthly launches from 10-4.

FROM NORTH

NJ Turnpike South to Exit 10, 287 North to Exit 14B (left-hand exit), 202/206 South to Circle

FROM SOUTH

202 North to Milltown Rd.; or 206 North to Circle

FROM EAST

287 North to Exit 13, 202/206 South to Circle

FROM WEST

Rt.78/ Rt.80 East to 287-S, Exit 17, 202/206 South to Circle

Local Facilities

AMENITIES Public Restrooms on site. Fast food locations (Dunkin' Donuts & McDonald's) on Rt. 202.

EQUIPMENT Launching your rocket with GSSS is free. GSSS provides launching facilities and operates under the mis-fire alley protocols. You must supply your own rockets, wadding, rocket motors and ignitors.

MODEL ROCKET SUPPLIES If you wish to purchase motors and other hobby items on-site, Heavenly Hobbies is usually present at the field. We highly recommend you contact them first with your needs and to confirm their attendance and let them know if you need something particular so they can bring it. Toys R Us, Michael's, and Walmart are in the area too and carry some model rocket items.

Map of Launch Site

GSSS Launch Regulations

1. All models/launches to be in compliance with the NAR Model Rocket.Safety Code.
2. All models ready to launch must be presented to the RSO for a safety check.
3. When using the ALLEY SYSTEM, permission to launch must be given by the RSO. A **loud** 5 second countdown must be used before launch.
4. An attempt **MUST** be made to insure that all models are recovered within the boundaries of the park. Using engine/recovery systems compatible with wind conditions etc. (This does not apply at contests).
5. High power (Over 30 Newton-seconds) flights, when allowed by the RSO will be ignited from a minimum distance of 30 feet. (Recovery as in rule #4).
6. Models using more than 30 Newton-seconds of power must use at least a 3/16" or 1/4" launch rod. If smaller, model may not be allowed to fly. (RSO to decide)
7. MOD-ROC flights will be allowed at the discretion of the RSO. (Recovery as in rule #4).
8. Entry and exit from the launch area will be from one end only, at the R S O table.
9. Static testing of engines will not be allowed.
10. Long thrusting engines should only be used in very calm wind conditions (No more than 4.5 seconds of thrust time can be flown. Recovery as in rule #4)
11. All prepping of models will be done outside of launch area.
12. Alcohol is not allowed at any GSSS model rocket launch.

A Note About North Branch Park

Please keep in mind that the park and weather conditions dictate what we allow to fly. If the Range Safety Officer (RSO) does not feel the model can be safely flown or recovered within the park's boundaries, it will not be flown regardless of the weight or impulse. If some other activity shows up and starts using the adjoining fields, the RSO will reduce impulse for all flights. So, bring some small stuff just in case. Remember, we share the park. We do not pay a fee and most of us are not a resident of that county. Rocket flying fields in New Jersey are n short supply, and we are protective of the fields we have. If you are unhappy with this limitation, then we invite you to help us in gaining legal access to privately owned, large, open fields.

Also see the GSSS Launch Regulations

National Events

The 2019 national events have been announced!
More details will follow shortly.

NARCON-2019

Coco Beach, Florida
March 1-3, 2019.

National Sport Launch

Lucerne Dry Lake, California
June 8-10 2019.

Rocketry Festival 2019

NARAM-61

US Team Selection Flyoffs

FAI Open - NorthCoast Cup

Muncie Indiana

July 27 – August 3, 2019

"The Eagle Has Landed"

50th Anniversary of the Apollo 11 Moon Landing

Sport flying will begin on Saturday the 27th and run until the following Saturday the 3rd.

FAI USA Team Flyoffs will begin on Sunday the 28th and end 3 days later on Tuesday the 30th.

NARAM blasts off on Wednesday the 31st and runs through Saturday the 3rd... a *4 day* NARAM!

NARAM 61 EVENTS

1/4A PARACHUTE DURATION
1/4A HELICOPTER DURATION
A BOOST GLIDER DURATION
A EGGLOFT DURATION
B PAYLOAD ALTITUDE ALTIMETER
B EGGLOFT ALTITUDE ALTIMETER
C ROCKET GLIDER MULTI-ROUND
E ALTITUDE ALTIMETER
SCALE
RESEARCH & DEVELOPEMENT

2018-2019 NRC Events

As of August 11, 2018, the National Rocket Competition (NRC) for the 2018-2019 season has begun. The NAR Contest Board is pleased to announce that the following events will make up the 2018-2019 National Rocket Competition (NRC).

1/4A-Parachute Duration
1/4A-Helicopter Duration
A-Boost Glider
B Eggloft Duration
B-Payload Altitude-Altimeter
C Egg Altitude-Altimeter

In accordance with Rule 6.3.1 of the Sporting Code. Members may begin flying these events the first day after NARAM ends, August 11, 2018. The NRC ends on June 30 of 2019.
Rules can be found at:
https://tinyurl.com/yd6nx73v

40TH Ljubljana Cup Stuart Lodge

LJUBLJANA is always the 'World Cup Finale', anyone in the mixer for a World Cup podium – across the spectrum of classes – must attend, entries always massive, standard of models /flying just stellar. 2018 was the 40th Ljubljana Cup and time to remember that it was Slovenia that triggered the – less than Velvet.. - schisms of the former-Yugoslavia in 1991. None of this affected the Ljubljana Cup, which proceeded through the struggles, becoming the greatest World Cup in the FAI calendar…the World Cup Finale. 2018's 40th saw Belarus, Bulgaria, Croatia, Czechia, Great Britain, Germany, guests Hungary, Poland, Romania, Russia, Serbia, Slovenia, Switzerland and Slovakia fighting it out for the Dragons, across the spectrum of classes. The World Cup embraces S4A-Boost Glider, S6A-Streamer Duration, S7-Scale and S8E/P-RC Rocket Glider… this report focuses on S7-Scale, with a very strong and varied entry in the hall, it would be a real challenge for Judges, Bedrich Pavka, Andrej Vrbec and Stuart Lodge

Soyuz TMA, by Dinitar Vachkov (BUL) sheds its boosters and stages... Spectacular and got a super Silver Dragon. One of the best prototypes in the World Cup, season-long.

Intro – part 2.. The Czech World Cup at Letovice took place three weekends earlier, featuring your scribe on the Judging panel and there was a significant commonality between the S7-Scale hall, at Letovice and Ljubljana, with half the latter's entry also having featured in the Czech event. Prototypes lining up were; Ariane 44LP, Soyuz TMA-22, Saturn 1B SA 205, Sonda S3 + S5, Eridan E012 B, Sonda S9, Rohini RH-75, Ariane 1 L03, Taurus Tomahawk, Eridan E007, Meteor 1E, Black Brant-VB. Big players in S7-Scale were, Peter Matuška, with a super Saturn 1B prototype, Dimitar Vachkov (BUL) presenting a succulent Soyuz TMA and Lucian Sercaianu with a tried and tested Ariane 44LP. Other contenders with simpler models were Jiří Konkol (CZE) with the 2-stage Sonda S3+S5, Boris Cesnek (SVK) with an Ariane 1 L03, with plenty of others ready to upset the apple cart if the stars failed to come up to expectations.

Dimitar Vachkov's (BUL) Soyuz TMA-22 – just like the one that boosted Tim Peake recently – is seriously cool. Check out the rear end detailing.

S7-Scale ~ Static judging twelve prototypes in the hall, with the magical Soyuz TMA-22 of Dimitar Vachkov (BUL) nailing a super 527 points. Letovice-winning Saturn 1B of Peter Matuška in second place with 518pts, with Lucian Sercaiainu's (ROM) Ariane 44LP nailing 507pts for 3rd. If the models flew as good as they looked, this was the podium. Plenty more impressive models in the hall, like Michal Hricinda's (SVK) Sonda S9, Ariane 1 L-03 by Boris Cesnek (SVK) and Eridan E007 by Stefan Vasilev (BUL). Like Letovice, 3 weeks earlier, it'd all come down to the flying.

Ardrej Vrbec runs his rule over the table. Always judges really well and consistently, probably the best young scale judge in the world.

S7-Scale ~ the Flying.. Conditions good, but rather damp, following heavy rain…but no wind, so the flying promised to be spectacular. Excitement mounted when superstars, Lucian Sercaianu and Peter Matuška's Ariane 44LP and Saturn 1B got DQs for technical flaws in Round 1, letting in Jiří Konkol…his Sonda S3+S5 nailing a super 2-stage boost and good recovery. There were no less than 8 disqualified flights in Round 1, which asked a few questions. Round 2 was brilliant, with Matuška's Saturn 1B bending

Lucian Sercaianu (ROM) pushes the button to fire that spectacular cluster of motors. 1st Round boost was a DQ, but got it seriously right in Round 2 to nail the Golden Dragon and top spot in 2018's World Cup. AWESOME.

Peter Matuska (SVK) boosts his super Saturn 1B. A classic prototype that boosts as well as it looks… always scores well…3rd place and the Silver Dragon this time.

Jan Sebesta (CZE) prepares his nice Eridan E 012 B sounding rocket for flight. Almost always guaranteed a 40 point 'Originality' bonus. Flies well too and came 5th.

the sky with a 3-staged boost with special effects (SFX) and lots of scoring parachutes and streamers, to become 'leader in the clubhouse' for a considerable time. Dimitar Vachkov (BUL) nailed a spectacular 2-staged boost and a decent score…and a podium surely. Lucian Sercainau stepped up to the plate, with plenty on offer…3-staged, spectacular SFX, in what has proven to be a reliable Ariane 44LP prototype for some years. Just magical, with everything working and a flight score of 210 points, rendering him untouchable. Plenty more to follow, but it was these that mattered. Almost sadly, Dimitar Vachkov suffered the usual 'penalty' for flying Soyuz…FAI Sporting Code designates these as TWO-staged, which meant that he was 30 points worse off than 3-staged Arianes and Saturn, but his second place was still a super result. So how did it look?

Dimitar Vachkov (BUL) wires up the cluster stack on his Soyuz TMA-22. Nailed a super boost with lots of SFX for 2nd lace and the Silver Dragon.

Place	Competitor	Prototype	Static	Flight	Total
1	Lucian SERCAIANU (ROM)	Ariane 44LP	507	210 =	717
2	Dimitar VACHKOV (BUL)	Soyuz TMA-22	527	185 =	712
3	Peter MATUSKA (SVK)	Saturn 1B SA 205	518	120 =	638

World Cup 2018…where did this leave us. Aggregated totals in S7-Scale for the past year look like:

1	Lucian SERCAIANU (ROM)	319 points
2	Peter MATUŠKA (SVK)	318 points
3	Aleksandr ZAGORODNY (RUS)	259 points

Soyuz TMA-22 by Bulagarian, Dimitar Vachkov, blasts off on its vital qualification flight. Got a Silver Dragon.

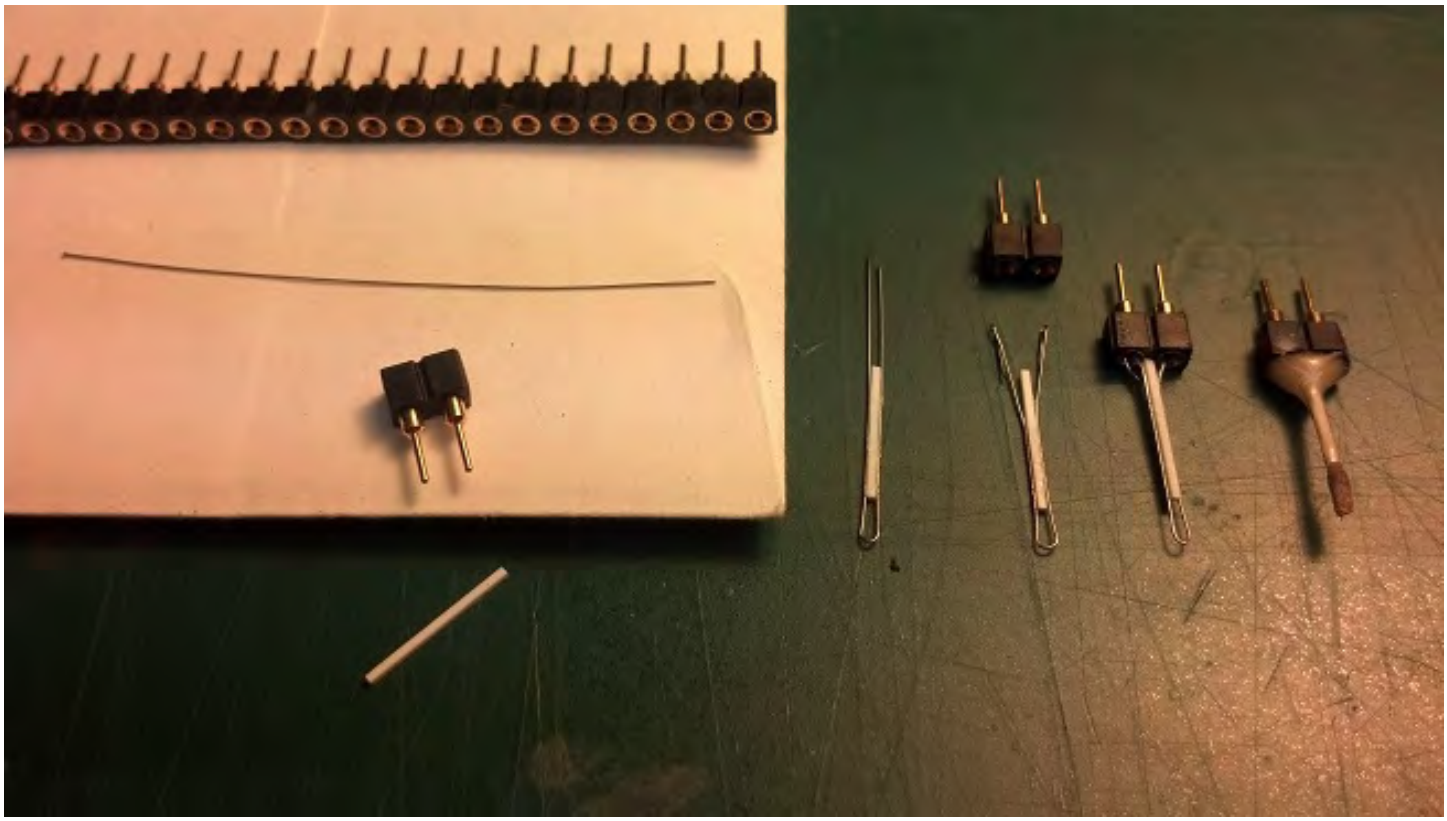
Coolest competitor on the World Cup circuit, Ewa Dudziak Przybytek (POL), preps her nice Meteor 1.

Other significant year-long scorers were, Slovakian, Michal Hricinda 231 points, with a very simple Sonda S9 protoytype and Dimitar Vachkov (BUL), 214 points. What all this proves though is that the Ljubljana Cup really is the World Cup Finale…you need to be there, shooting for the stars, in all the classes.

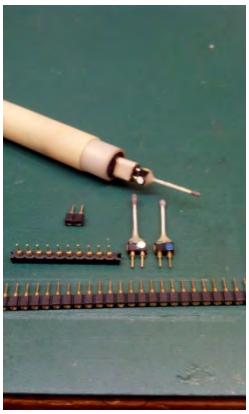
1:1 scale Portaloo always makes the best flight at Ljubljana Cups. Everyone knows it's the best way to close the party! SPECTACULAR.

Round up… .Ljubljana was a fantastic World Cup and it was a real honour to be carded as a judge S7-Scale at this event, Thank You, Tone Sijanec – Ljubljana Cup Contest Director. In addition, thanks are due for the marvelous accommodation at the Health Spa, Terme Snovok…about the best anywhere. Naturally, a few question marks persist, regarding the 'Originality Rule' , where prototypes unique in the judging hall score a bonus of 40 points; with only two, scoring 20 each. What can't be argued is that entry levels have increased since this rule came into play ~5 years ago. Whether Soyuz really are 3-staged rather than 2-staged + SFX…15 points less, is another question and one that needs FAI-CIAM to sort out. What can't be argued is that the World Cup is the best thing Space Modelling ever did, entry levels at record highs, across the classes, with lots of juniors – both sexes – in the mixer. Will I be doing this in 2019? …yup and probably carded for the European Champ's judging panel, in Romania. This weekend was were a magical experience and we haven't even included the tourism! Must do more.

SACL 15/10/18



Not ALL Ignitors are “Just an Ignitor”



Any persistent reader of the Launch Rack knows I take an absolutely evil pleasure ribbing my good friend Jay Marsh, who just so happens to be the Vice President for AMA District 4. I zing him because he IS a good friend, I like him and he can take it (sometimes.) I hate to disappoint you all, but this time I can't do that. Jay gets Top Honors and I laud him for his innovation and efforts creating an ignitor system for the US Spacemodeling Team.

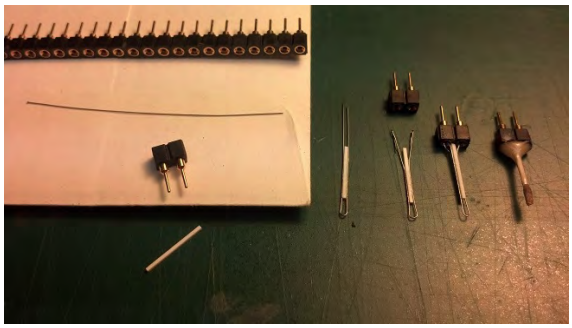
Far too often we see competitors (local, national and international) running back and forth feverishly when they have a misfire, searching for a backup ignitor. Normally I do not do that – because I use J-nitors. I have seen them fail only twice in my life and both times may have been due to the motor type and not the ignitor. The ignitors fired, but just failed to ignite the composite. But few of you know what goes into the making of a simple “ignitor” and most ponder why good ones cost soo much for a stupid loop of wire. Let me explain what Jay goes through to make his J-nitors and maybe then you will gain a greater appreciation for what your entire design/planning/building/traveling/prepping and financial investments all comes down to: Your Ignitor. If its not reliable, your sunk.

Each of these ignitors are individually - hand made, one at a time, although each “type” looks nearly identical, like they came out of a machine. “Types” differ by the over-all length and pyrogen head diameters, to fit the variances between motor nozzle diameters and core or throat depths. European competition motor manufacture is basically a “cottage industry” so motors vary widely in their dimensions. Jay has collected data on as many of these as he could find, to determine the required size ignitor for a specific motor. Each head just passes through the nozzle orifice to maximize pyrogen and is long enough to insure intimate contact with the propellant at the end of the motor core. These parameters are coded and marked on each ignitor with a series of colored paint dots. Ok, if I were to complain about something it would be here – sometimes the paint dots are not absolutely, perfectly round and you would think that someone putting in the enormous effort that he does would be a little more consistent with the marked paint dots! So, Clean It Up Jay! <G> That said, it may be a long time before I see my next one...

OK, so how is done? How do you make 1 (o-n-e) J-nitor?

Since many fliers use a 10mm piston tube for Euro-made motors, this required a small plug-in type ignitor, small enough to fit inside through an electrical connection on a centered support rod inside. A two position SIP socket was the logical choice. But dual position SIP sockets are expensive individually so Jay orders an array of 132, the longest made, then cuts them apart into 66 individual 2-position SIP sockets, reducing cost. The thickness of common Dremel separating discs is problematic – their cut is usually so thick and wide that a SIP socket on one side of the pair ends up being cut through and sacrificed. It was financially inefficient. I found through Dental Supply Houses an incredibly thin edge cutting diamond disc that neatly fit in the groove between the SIP sockets (commonly used when casting gold inlay dental restorations). With its use we eliminated the waste of a socket, despite the high initial cost of the diamond dental disc. The rest of the ignitor's structural parts consist of the support stalk and ignitor wire.

With known motor nozzle depths, pyrogen/wire support stalks are made from 1/2mm square styrene or similar ABS plastic. Each are cut to a uniform length using a jig made just for that ignitor length. Likewise, the length of the required Nichrome wire was calculated and a similar jig made to cut each to the correct length. I should note that ultra thin nichrome is not common and specially ordered. The thickness was determined by electrical characteristics and structural needs. It just so happens that the orthodontic ligature wire used for tying braces together, is commonly available on spools, close to requirements and made of nichrome. Once support parts are made and collected, fabrication is begun. And, All accurate things made, require jigs...



The nichrome wire is bent to the proper length at the center and form on a jig. Then the corresponding plastic support rod (the stalk) is positioned between the halves of wire, leaving a loop of sufficient size to hold pyrogen on the tip. Using locking dental pliers (tweezers) the loose ends of wire are then bent or rolled to fit the width of the SIP socket. CA is used to tack the nichrome wire to the stalk. The wire is removed from the jig and the rolled ends inserted into the open ends of a dual SIP socket. The ignitor support is then coated and formed by hand with a mixture of G-Flex epoxy filled with microballoons, then set aside to cure. This requires a day or 2 for a full set.

Once cured and structurally sound (each unit is tested for reliability, physically and with an ohm meter) the application of pyrogen is performed. But first, the tip of each nichrome wire loop is flattened with a flat punch and hammer tap. This thins the wire loop at its center, creating an area of higher resistance to insure the J-nitor flames at its tip. This is again checked by ohm meter for continuity. Apogee DipIt is Jay's pyrogen of choice, thinned with acetone to what has become the “proper” consistency for head formation. The ignitor tip is dipped 3 or 4 times allowing it to dry through evaporation of the solvent between coats. This allows for the head to form relatively consistently and is finally molded by hand on the later dips. To insure proper and consistent head diameter, each ignitor is sized with a wire gage (jig) for the nozzle throat it is intended for. Jay has to sand each ignitor head by hand to trim excess pyrogen to avoid breakage, until the diameter required fits the gage. Lastly, the ignitor is rechecked for continuity with an ohm meter and the proper paint dot coding applied to the base. The paint dots are applied in 3 areas to insure proper identification should one set be marred or scraped off. Only then can this critical part or your armamentarium be called a “**J-nitor**”

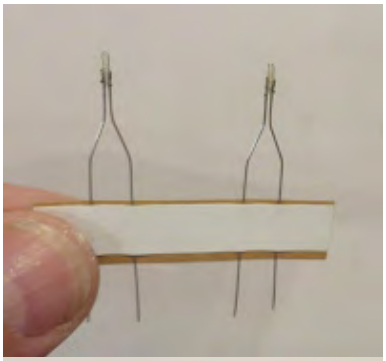
It should be noted, J-nitors are not cheap, either in their development, materials, assembly or labor. They **ARE** some of the finest, hand made, reliable and and competitive pieces of equipment on the field. I can only say, they got that way through Jay's attention to detail. Once a year I see Jay go through ignitor “Amok Time” (for those familiar with Vulcan mating ritual) where, for a few weeks, he is consumed with J-nitor fabrication. I guess you'd have to call it a labor of love? <G>

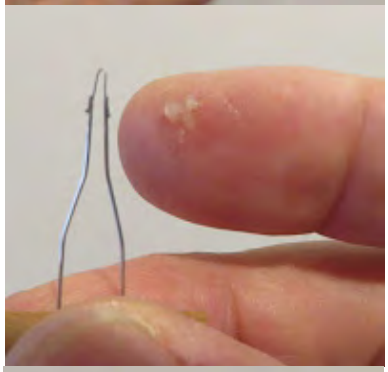
Just imagine what went into making this vast array of J-nitors for the United States Spacemodeling Team

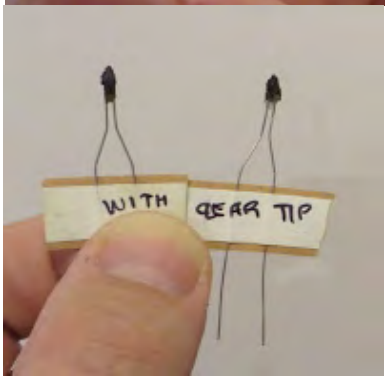
TECHNO-FILES

Well we haven't had much in the way of club launches the last year, but when you do get out there - the last thing you want is a crappy ignitor fouling up your long anticipated launch – here are some tips

About Me: **Chris Michielssen** - Orlando, Florida,
Avid builder and sometime flyer of LPR rockets. Started in 1969 with the Vashon "Cold Powered" liquid Freon powered rockets because of rigid CA fireworks laws. Back into LPR rocketry with a vengeance! In Oct. 2009 I started Odd'l Rockets, a small rocketry company selling Odd-Rocs and accessories. [See: modelrocketbuilding.blogspot.com]







Estes "Starter" Igniter Upgrade - Update

A while back I started upgrading the clear tip Estes Starter Igniters using Beacon Fabri-Tac glue and 4F black powder. Many have commented that the igniter treatment has helped them have quicker, more reliable launches.
At the recent Estes NARAM plant tour, we saw the igniter machine in operation. Somebody mentioned the clear igniter tip was nothing more than corn starch, glue and water.

The clear tip is water soluble. I bent the wire ends over the top lip glass of water and let the clear tip soak for a few minutes.

The softened clear tip came off pretty easily. The bridge wire top loop is delicate. Go easy when knocking off the clear tip.

These two bare wire starters got the Fabri-Tac glue and powdered black powder applied.

Two regular clear tip were tested beside two with the clear tip removed. All four starters got the glue and BP treatment.

It was apparent the clear tipped igniters took a moment longer to heat before the black powder treatment would flame.
The igniters with the clear tip removed flamed up much faster than the igniters with the clear tips. The clear tips slowed up the heating of the bridge wire. So, there you go! If you add an additional step, the Estes Starters can be further improved.

Upgrading Estes "Starter" Igniters, Part 1

I noticed a delay and an occasional misfire using the newer Estes "Starter" Igniters. My schoolyard launch controller is a typical 6 volt Estes system. Ignition was slower, almost like using bare nichrome wire when I started launching rockets in 1969. Press the launch button and hold it down until ignition of the engine.

I had tried using an available dip kit but became frustrated when the mixture continually dried out. Sure you can add acetone and stir (very messy), I wanted a simpler solution.

I wrote a short article for the NAR Sport Rocketry magazine and was surprised when it was published in the 2017 September/October issue. This post explains what was in that article.
Please note: Read these precautions from the Goex website before proceeding. I have not used this technique in engine clustering. I cannot guarantee this method will work with clusters.

I'm fortunate to have a black powder gun supply store here in Orlando. I bought some Goex FFFF (4F) gun powder. The 4F is finer and faster burning.

The Beacon Fabri-tac glue is used to bond the powder grains to the clear igniter tip.

Shake a small amount of the black powder into the bottle cap. It doesn't take much. Be careful, the black powder grains can and will go everywhere. Squeeze a small amount of the Beacon glue onto the clear "Starter" tip. Go light, it doesn't take much glue.

Upgrading Estes "Starter" Igniters, Part 2

Roll the glued starter in the loose black powder. Go light, it's easy to pick up too much powder in the glue. Turn over the igniter and repeat.

While the glue is still wet, form the tip with your fingertips. Keep the tip small, it still has to fit into the nozzle.

Here's the finished, upgraded starter igniter with well formed tips.

If you test them next to the clear tipped starters you'll see the starters heat and glow red. The upgraded igniters will heat, flame up and spark.

DIY Igniter Coating

From the NAR Facebook page, Steve Taylor writes: "After 15 failed igniters yesterday, they are getting the FFFF treatment. Funny how they work like the old igniters with the black tips now. I hope Estes is fixing this little problem."

That's DAP Rapidfuse glue and FFFF Black Powder. This could be a good solution. The igniter dip I purchased requires a tablespoon of acetone and stirring each month to keep the mixture from drying out.

With Steve's method you could make up pyrogen igniters whenever you want and not worry if your igniter dip has dried out.

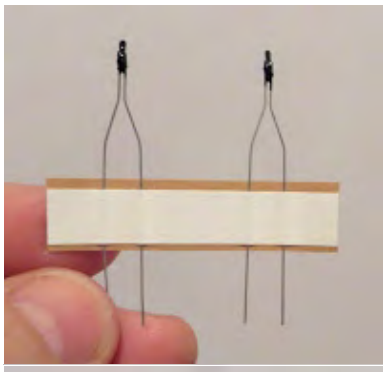
Now I just have to find the Rapidfuse glue and FFFF black powder.

Igniter Coat Testing

I've mentioned this in a post before. My supply of older (black pyrogen coated) Estes igniters is running low! Time to revisit lacquer coating the new Estes Starters.

While it's not an actual pyrogen, when coated this way the igniter will flame instead of just heating red hot.

I bought some cheap black fingernail polish at the Dollar Tree store. Be sure the ingredients include **Nitocellulose**. That's the lacquer that will burn when heated.

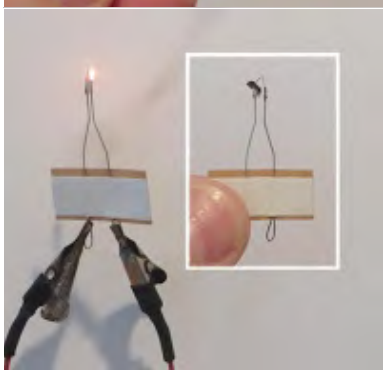


I used the brush attached to the cap to paint the igniter tips. *Now they at least look like the old Estes igniters.*

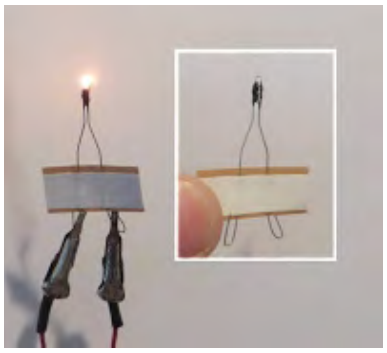
Here's an Estes clear tip Starter igniter after the launch button was pressed. I'm using my old Estes 6 volt with four AA batteries.

It's hard to capture with my digital camera, but this clear tip isn't flaring up. The bridge wire is heating and red hot, the clear coat just melts.

The inset picture shows the igniter afterwards.



Here's the black lacquer coated tip after heating. After this picture was taken the tip lit and flamed like a struck match! It took about 1/2 second for the flame to start. The inset shows the black lacquer after it flamed up.



The new clear tip Estes Starters will ignite an engine when used correctly. They remind me of using bare nichrome, it takes an extra second to ignite, where the older igniters were quick. You'll see faster ignition using a 12 volt system.

Lackey's Safety Note:

Chris has graciously given his permission to reprint these tips from his web pages. But they come with a **CAUTION**. Dealing with, making, modifying or testing pyrotechnic materials can be DANGEROUS if you do not follow the rules and exercise common safety precautions!

Estes has changed the formulation of their ignitor coating to comply with stringent shipping requirements and laws. It does not mean their Starters are any better than the old Ignitors. They are a pitiful replacement. I dare to say, many rocketeers will find this to be true and will attempt to “upgrade” their Starters with some pyrotechnic material. This in itself could compromise the safety record we have established should an accident occur. If your product works poorly, you have to expect your consumers to try and do something about it, if you as a manufacturer do nothing to meet expectations.

These articles are brought to you here in the Launch Rack to inform and instruct proper material handling and procedures and minimize uneducated experimentation. We are trying to keep you SAFE – Ok?

For Cripe's sake - don't smoke or use these materials around open flames or heat sources and only proceed in a well ventilated room due to some of the fumes. Safety First – then have fun! [lky.2theed.]

TECHNO-FILES

How do you solve a problem like ~~Maria?~~

Um, 1/4A Helicopter Duration?

A Dr.Bob Kit Review

CAUTION!: You may begin seeing Rockets in everything you look at!

Well, Maria sounded a lot better than how do you solve the problem of 1/4A Helicopter Duration – right? That might better be put: How do you get Super Performance from a small Helicopter that might fly as high as, what.... 36 meters on 1/4A??? If you believe in simulations, that's all you're going to get! The average helicopter model will drop 20 meters before it spins up to its working rpm's which leaves you with somewhere around 15 meters (45 feet) of flight altitude. Not much. Not much at all... So, how – do we – solve a problem like "Maria"?

I remember years ago Tim Van Milligan (Owner, Apogee Rockets) showing up for a US Team Trial with a 6 bladed A helicopter that when the blades folded down, they formed the body of the rocket! (I also remember him asking me for a bulk purchase of colored orthodontic elastics (rubber bands) – I see he still uses them in his kits.! <G> They will straighten anything – including helicopter rotor blades!) And Tim has come up with a design that may just answer the question "How do you solve a problem like 1/4A Helicopter Duration?"

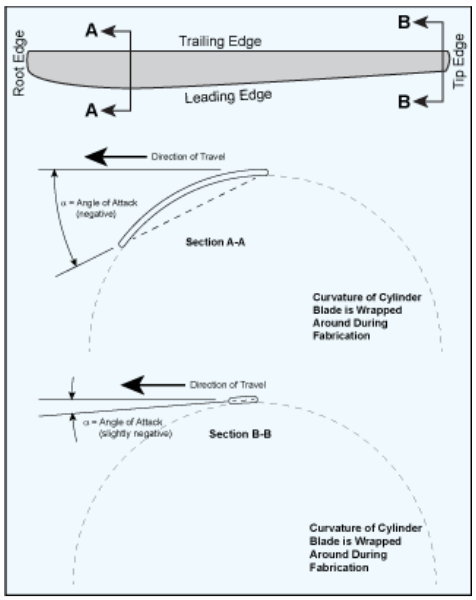
Trip Barber, our former NAR VP, won a Bronze Medal at the 2014 FAI World Championships with an HD design developed by Keith Vinyard. Based on this design Tim has scaled down this FAI A-HD model and marketed the Apogee "Mini-Copter." The construction employs some high engineering – Tim has over 80 minutes of construction videos for this model on the Apogee site. They are excellent and a "must see" when constructing this model. They are contained on a DVD that actually comes with the kit! Who needs printed instructions when you get a video of "how to do it?" <G> It is not surprising that this model is probably the smallest and lightest Skill Level 5 model you have ever come across. Let's take a look at the model's write-up and description from the Apogee web site . You can consider for yourself what makes the Mini Copter a very serious competitive model. I think you will find the amount of work and designing that went into this kit is more than the $18 price tag. Take a look at what you get:

The Mini-Copter is a small helicopter duration rocket that will help you win the next contest. It is designed to use those 13mm diameter motors, so it can be flown on 1/4A, 1/2A, and A size motors from Estes. Because it flies so high with the A-size motor, we recommend flying it first on a 1/2A3-4T motor for the first flight.

The Mini-Copter was more challenging to design than the other two curved-blades helicopters that we sell (Gyro-Chaser and the Rotary Revolution). The reason is that there isn't much space inside a small diameter body tube to fit the hub and the fold-down blades.

The three blades are laser-cut from 1/32-inch (.8 mm) thick balsa wood. This is really thin stuff. The obvious reason for such wafer-thin material is to make lightweight blades. It is so thin, that they are actually hard to cut. When the laser cutter moves over the sheet of wood to cut it, filtration fans cause air turbulence that lifts up the wood and can move it around. We have to slow down the cutting speed and use some other proprietary techniques to make sure this thin wood cuts correctly.

The other unique feature of the blades is that they have to be curved during construction. You'll do this by wetting them down so they want to warp. While they are wet, you'll strap them down



See Peak-of-Flight Newsletter #342 for more information

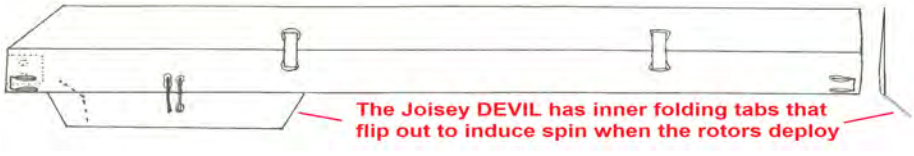
against a wood dowel. Once they are dry, they are curved and much stiffer. It is this curved shaped that causes the rotor blades to spin when they are attached to the hub. (Tim now recommends warping the blades using a 9/16" dowel not 1/2" one seen on the construction video.)

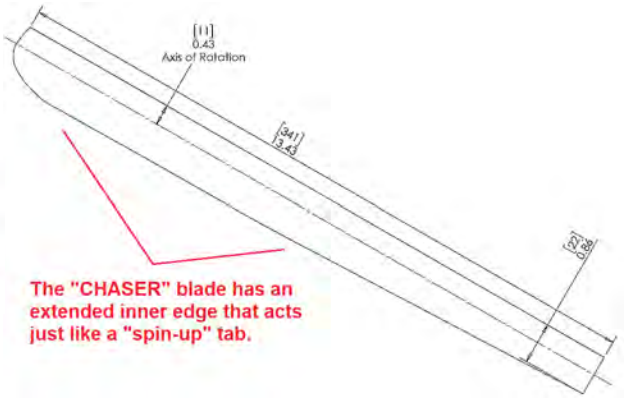
The hub is the other key component that makes the Mini-Copter special. If you read about the development of the hub in the Apogee *Peak-of-Flight Newsletter* #375, you'll see that an awful lot of engineering and testing went into the part. It looks so simple, but that hub performs a lot of functions that make the Mini-Copter state of the art.

To be honest, as the designer, I'm very pleased about the rotor hub. But then, the design of this key component took months to perfect. Looking at its simple shape, it doesn't seem apparent at how complex it really is.

It does many different things:

1. The central hole allows it to free spin about the central shaft.
2. It provides three pivot point for the rotor blades.
3. The pivot points are exactly 120 degrees apart, so your blades are spaced properly to provide easy balancing.
4. The pivot point is actually offset from the face of the hub, maximizing the strength of the dihedral stop which also allows for larger rotor blades. The pivot point is below the bottom surface of the hub plate, not in the middle.
5. The distance of the pivot points from the central shaft is set to maximize the width of the rotor blades. The blades are not perpendicular to the central shaft. They are off-set to the side because there is so little room inside the 18mm diameter tube.
6. The flat edges of the hub plate reduces any sliding friction of the hub as it ejects out of the body tube.
7. The radial slots in the hub plate prevent lateral movement of the rotor blades, so they are always perpendicular to the central shaft.
8. The support arms have a tooth on the tip that sets the correct dihedral angle of the rotor blades.
9. The support arms have a tab that engages a slot in the blades, so they are parallel to the axis of the rocket. It is impossible to have a crooked blade.
10. The support arm strengthens the balsa wood rotor blades at the point where they are at their weakest.
11. The support arm also incorporates the hook for the actuator rubber bands.





The cool thing about this is that it is made out of laser-cut plywood, so the weight is reduced while the strength is increased. The hub is also very strong, and you'll break a blade long before the hub will break. And replacing a blade, as any experienced helicopter builder will tell you, is much easier than replacing a hub.

The rocket features a central shaft that the rotor hub is attached to. We used the best material for this, which is graphite/epoxy. It is nearly unbreakable, and it is lightweight and perfectly straight.

The hub is designed to freely rotate around this graphite shaft. The advantage of this is that it limits the rotational drag of the spinning rocket, which could slow down the spinning of the blades. You want the blades to spin as fast as possible, as the then create the maximum amount of lift that slows the descent of the model.

What Makes This a Skill Level 5 Rocket?

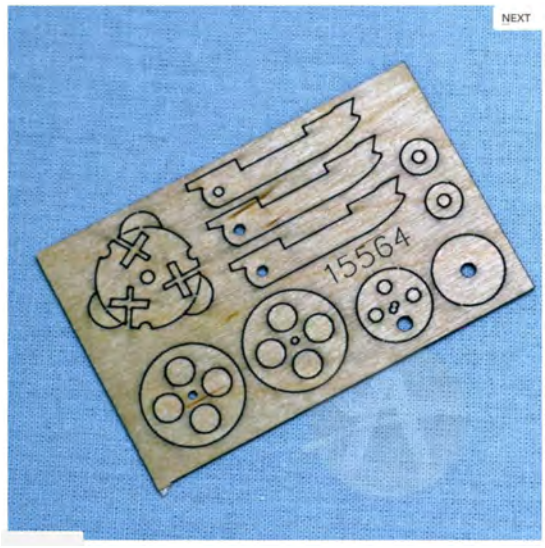
The Mini-Copter is something we classify as a Skill Level 5 category rocket kit. Under our classification system, this is a kit that requires a significant amount of experience to build it. We rate this kit as extremely challenging because the parts that make up the rotor hub are very small and hard to hold while you are putting the rocket together. The hub is the most crucial part of the kit, and the pieces have to be assembled correctly in order for this rocket to spin correctly. If the assembly process is rushed, it is easy to get glue in the pivot mechanism, rendering the hub inoperable.

Additionally, this kit requires several construction techniques that you may not have done in your previous rocketry experience.

First, the blades are curved. They have to be warped into this shape by getting them wet in a solution of water and ammonia (you can use Windex® glass cleaner). If you try to bend them dry, they will easily crack; so they must be softened using the technique in the instructional videos.

Second, you will need a number of different types of glues (see the tools and materials under the Tools box). This increases the difficulty because each type of glue has its own characteristics.

Third, you'll have to cut the little aluminum tubes with a hobby knife. This can be tricky because the parts are small and can be easily ejected into the corner of the room where you'll never find them again.



Fourth, the parts of the hub are tiny -- smaller than the small pieces in the Gyro Chaser kit. This will require a lot of dexterity in your fingers. If you have "all thumbs", you'll be cursing us for all the tiny pieces.

For these reasons, we decided to create video instructions instead of written ones. The problem with printed instructions is that you don't see the techniques used in construction. For example, how do you position your fingers as you smooth the curved rotor blades? This makes a big difference in assembly, and you can only get that knowledge by watching someone else make the part. For people that want to fly through the assembly, videos will slow the process down, and you'll probably complain to us that you want printed instructions. Sorry... To us at Apogee Components, your flight's success is more important than speed of assembly.

The other thing that is a bit different about this rocket is that you'll be sealing the fins with super-glue. This is a tricky step, because the fins are very thin, and can be broken if you get too rough when you are sanding them after you seal the surface. Using super glue like this is difficult, and ADULT SUPERVISION IS REQUIRED if you're working with kids under the age of 18. When I build rockets with my own children, I will seal the fins for them, so that they don't have to handle the water-thin super glue. I urge you to follow my example and do it for the kids.

We recommend that you have built either the Rotary Revolution or the Gyro Chaser prior to building this rocket kit.

The good news is that all the wooden parts are pre-cut with extreme precision using a laser cutter. Everything fits just about as nice as you could wish.

Take a peek at the videos first! : **https://www.apogeerockets.com/Rocket-Kits/Skill-Level-5-Model-Rocket-Kits/Mini-Copter#related**

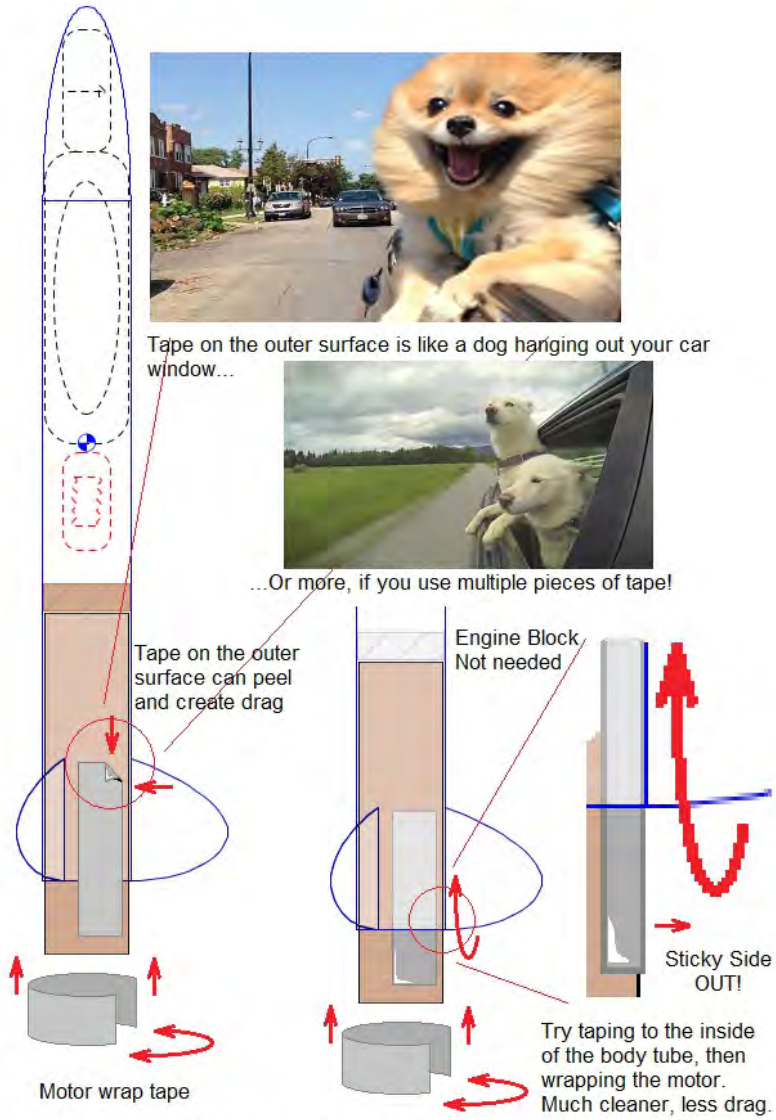
I bought and ordered the Mini-Copter to check it out. Looking at the kit that just came to me, there is a degree of complexity that must be respected – VIEW the instruction DVD FIRST – there are no “written instructions. Tim takes the time on the DVD to explain why you are doing what the kit calls for, instead of substituting materials or techniques and messing up a perfectly good model - or your money! He includes a number of modifications that will help improve your flight performance. Parts are well crafted and of high quality, but you may substitute and modify if you have built models like this before (if you know what you're doing) Oh - Tim doesn't mind if you name your Mini-Copter:“Maria.”

TECHNO-FILES

The Reverse Tape Technique

By: Dr. Bob Kreutz

Many times I position the trailing edge of my fins at the base of the model. It may be a short model body and I want to maximize the the CP as far back as I can, it may be a scale model with the fins located at the rear of the body or it could even be for a completely aesthetic thing. If you body diameter is minimum, there's just not a lot of tube to tape the motor in with. Classically, you would have to cut and position tape strips between the fins, then back onto the motor protruding from the aft of the rocket. For altitude models – this is just a plain no-no. Tape can peel, catch air and create drag on the model.



Classic Motor Tape Method **Reverse Motor Tape Technique**

I liken it to my dog hanging out of the window of my car, she's happy even at 50 mph. Now, when you're trying to squeeze the maximum altitude out of the model, everything that causes drag becomes critical!

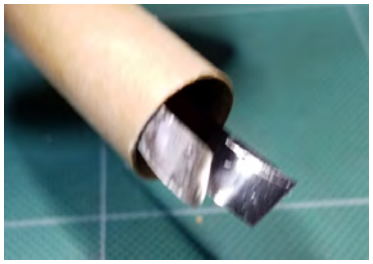
Enter the **Reverse Tape Technique.** I like to think that I came up with the idea (since I'm the only one I know using it, except those I may have shown it to...) but I'm almost certain I probably didn't. Reverse tape is a method of getting into those tight spots you absolutely have to, and its a much cleaner application that reduces drag.

Begin by cutting your tape to about 1+1/8" long (~30mm) you may also need to narrow it to about 1/4" (for small diameter models. I usually use two pieces. Place a piece of tape so 2/3rds the length is inside the model. With the sticky side facing outwards, adhere it to the inside wall of the body tube. Place the second piece on the other side, 180 degrees opposite in the same way. You'll have two pieces of tape sticking out the rear end of the model. Slide your motor in the tube between them. Then wrap the motor nozzle with an overlapping piece of the tape as you would do classically. Try to get the upper edge of the motor wrap tape strip as close to the body tube edge, as you can. You won't be pulling the paint off between your fins anymore...!

I like silver mylar tape for this technique. It is quite tear resistant and has some superior adhesive on it. When it sticks to itself, just try getting it apart. With your motor wrap tape positioned under the aft edge of the body tube, you can eliminate using an engine block and simply extend the position of the motor to where ever you want.

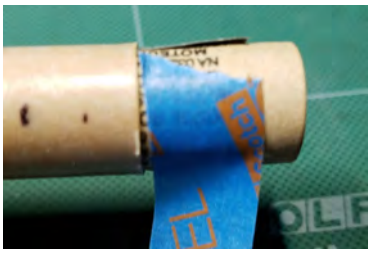
Start with a long thin strip of silver mylar tape. ←

Place the tape sticky side out on the inside of the body tube. →

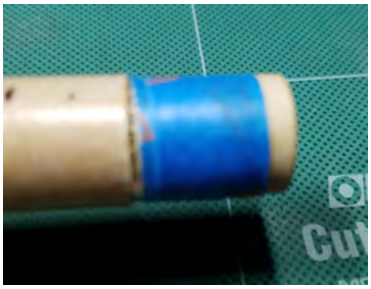


Place a second strip of tape directly opposite the first, 180 ← degrees apart.

Slide the motor between the two tape strips →



Begin motor wrap tape (of your choice) on the **uncovered motor** ← not the silver mylar tape.



Position the motor wrap tape so it butts up directly beneath the body tube. →

The Reverse Tape Technique can be applied to staged models of minimum diameter, as well as the Standard NAR Sand Payload so that the protruding section of payload can be used as a tube coupler or balsa bulkhead. It affords easy placement, removal, secure retention and a reduction in weight by eliminating unnecessary body construction parts!

Parting Shots - (or) - "Whasuup" in Space?

NEW HORIZONS Arrives: ULTIMA THULE

The New Horizons team used the Hubble Space Telescope to search for the next Kuiper Belt object to fly by after Pluto. Using observations made with Hubble on June 26, 2014, the science team discovered an object that New Horizons could reach with its available fuel. The object was subsequently designated 2014 MU69, given the minor planet number 485968, and based on public votes, nicknamed "Ultima Thule", (pronounced Tool-ae) which means "beyond the known world".

Ultima Thule is located in the Kuiper belt in the outermost regions of the Solar System. In the early morning of January 1st 2019 Eastern Time, NASA's New Horizons spacecraft flew by Ultima Thule at a distance of 3500 km (2200 miles). At this time, Ultima Thule will be at a distance of almost 6.5 billion km (4 billion miles) from the Sun, making this the most distant planetary flyby that has yet been attempted, and the first time that a Solar System object of this type has been seen close-up.

Ultima Thule measures approximately 30 km in diameter, and is irregularly shaped. In July 2017, Ultima Thule passed in front of a star as seen from Earth (a stellar occultation), allowing astronomers to determine that its shape is most likely a contact binary (two bodies that are touching) or a close binary system (two objects that are orbiting each other). An artist's impression of Ultima Thule as a contact binary is shown in the accompanying picture.

We will only know what Ultima Thule's surface looks like once New Horizons has sent back the first pictures after it has flown by, although based on observations of similar-sized Solar System objects, it will almost certainly display impact craters. The lighting environment at its surface is very dim, as it receives only about 0.05% of the light from the Sun that Earth does. We do know that Ultima Thule has a reddish color, probably caused by exposure of hydrocarbons to sunlight over billions of years. The flyby will also reveal whether it has any moons, or even a ring system. Ultima Thule belongs to a class of Kuiper belt objects called the "cold classicals", which have nearly circular orbits with low inclinations to the solar plane, and which have not been perturbed since their formation perhaps 4.6 billion years ago. Ultima Thule will therefore be the most primitive planetary object yet explored, and will reveal to us what conditions were like in this distant part of the Solar System.

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This Box is NOT Checked…

You're Good!

So this is Not your last Issue