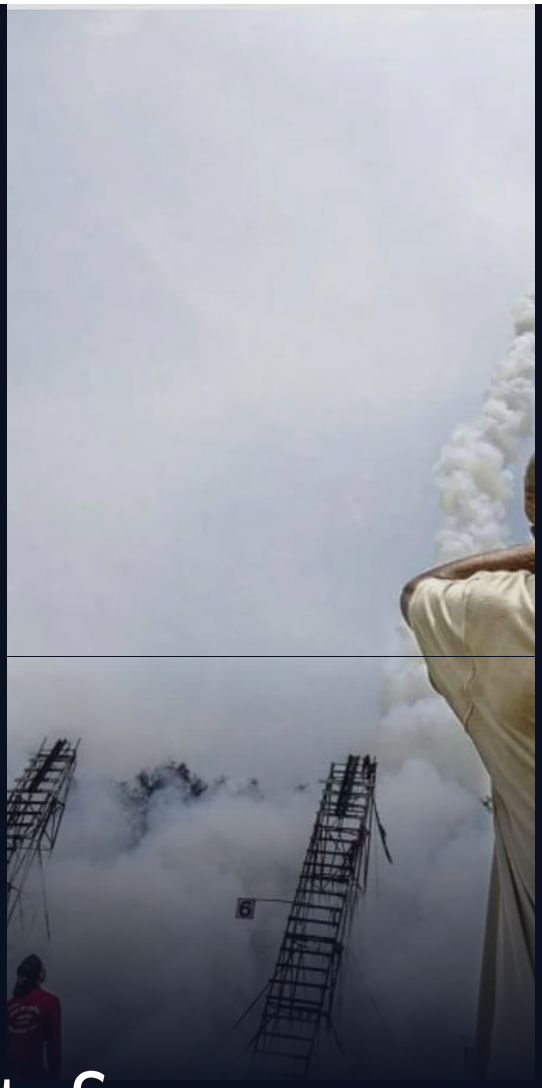
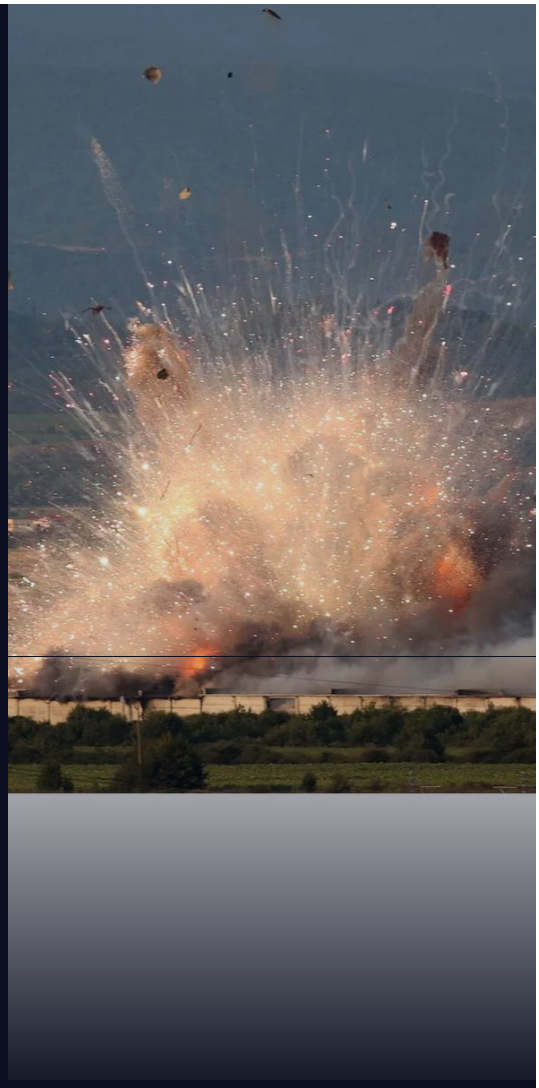






THE WPA JOURNAL

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WPA
WESTERN PYROTECHNIC ASSOCIATION

NEWS · JAN 5, 2026

Do-it 2025 at Americas Arsenal of Democracy Hawthorne NV



You have to admit, we've had a lot of fun at do-it over the years. Despite all the fears, despite all the tears. The dog food trucks blazing in the moonless night, the metal mixing bowls gleaming in the desert sunlight, the trash can mines, the jackalope instruments of terror, lampares, American Baraq shells, 16 inch shell heading on a BFR rocket with 32 motors. Trees 6lb whistles with 8" headings he somehow managed to get to go out of sight and then come down and go off at 300' every time.

All you cylinder and ball shell manufacturers that rocked our world.

Rocket men that went to the moon and back with a slide rule.

Shelters splintered by the wrath of a avenging angels howling over the hills.

Do it today, there may be a law against it tomorrow.

Watch the video

Scan the code, or visit https://youtube.com/shorts/S2sEqHHMxuM

Watch the video

Scan the code, or visit https://youtube.com/shorts/12RbQKMtihw

Watch the video

Scan the code, or visit https://youtube.com/shorts/bXrEUXOn63o

Jackalopes converging on another infernal contraption.



NUBBES NUGGETS: ZZTOP POWER TRIO





KURT ON A MISSION FUELED BY PEPSI AND THE WORD



WEST COVINA REPRESENTS



THE CHAIRMAN SPIKING







I HAD A TWO FOR ONE COUPON AT KFC I WISH I COULD FIND IT I WONDER IF IT WAS FOR A 16" CHRYSANTHEMUM



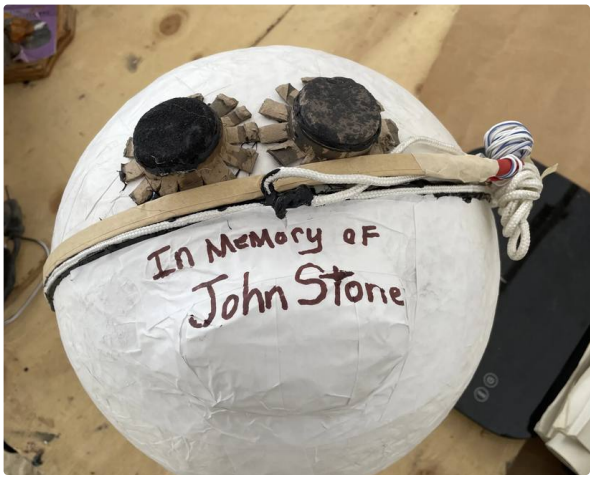
VIC AND THE GANG CRANKING THEM OUT

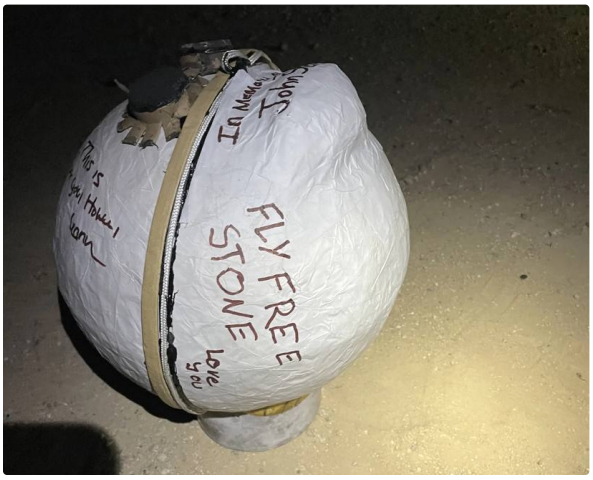


TREEMOBILE READY TO RACE TO THE ROCKET LINE



RIP JOHN STONE: HIS MEMORIAL SHELL OF SHELLS









PAPINI GROUP FINALLY STOPPED GOOFING OFF AND GOT TO WORK



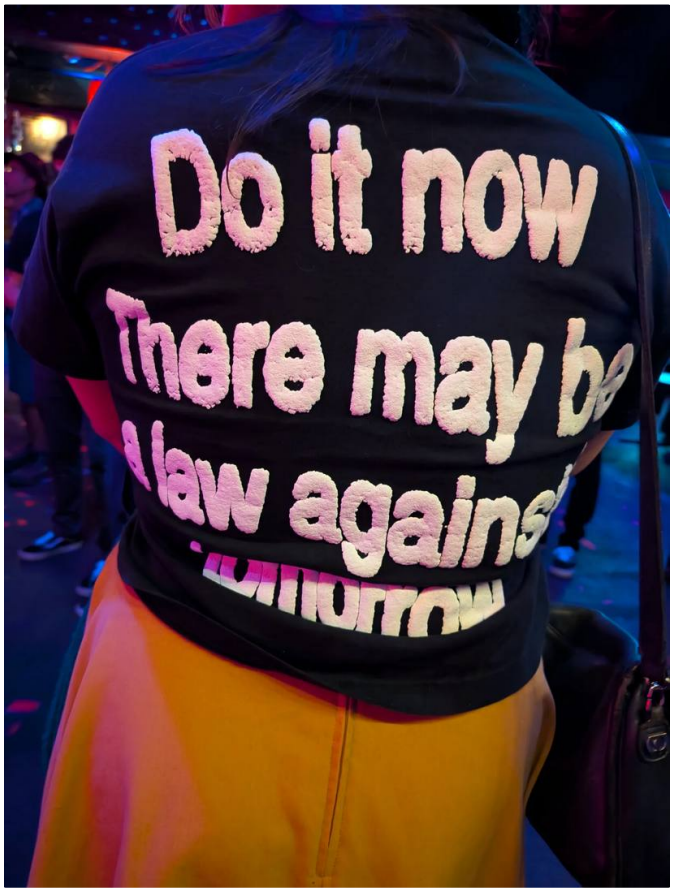






Watch the video
Scan the code, or visit https://youtu.be/j8_LpwSOjhA

LET THE WORD GO FORTH



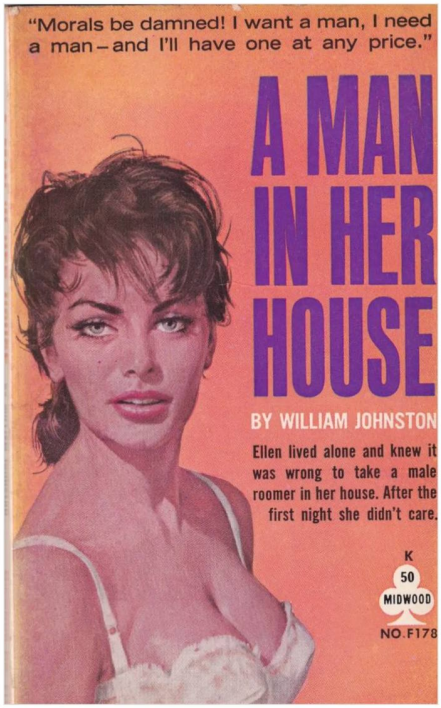
EXCEPT THE WPA SHE MEANS



FORTUNATELY THE NEW CLUB CODE OF CONDUCT COMING OUT SOON SHOULD PUT A LID ON VICE AND IMMORALITY

pulpcovers.com

A Man In Her House



"Morals be damned! I want a man, I need a

RESULTS OF OUTREACH ATTEMPTS TO GET YOUNGER MORE DIVERSE MEMBERSHIP



ORIGINAL GANGSTER: WHY BRITAIN DOESN'T ALLOW 80 PERCENT LOWERS ANY MORE



MEMBER OUTREACH TAKES US TO SOME FAR FLUNG CORNERS OF THE GLOBE LOOKING FOR THOSE ON OUR WAVELENGTH

Watch the video

Scan the code, or visit https://www.youtube.com/shorts/IrbkDbAJdU8

UNCATEGORIZED

Read it online

With the videos and comments: https://www.westernpyro.org/blog/do-it-2025-at-americas-arsenal-of-democracy-hawthorne-nv

NEWS · OCT 25, 2025

Thai Rockets Part 1 - Paul Moulder



ong and slow wins the race

Reprinted by permission of the author, originally published in fireworking.com, excellent Ned Gorski site you should all be subscribing to.

Black powder rockets have been made in Thailand, particularly in the North East (Issan) area of the country and in the bordering provinces of Laos, for hundreds of years. Other areas within Thailand where rockets are made are Sakgeow and Prajinburi provinces in the South East. The major Thai Rocket Festivals are held during the second week of May, and coincide with the beginning of the rice planting season, but groups of enthusiasts can be found almost throughout the year in some provinces, making and gambling on rocket launches during weekend meets.

Called Bang Fai or Bong Fai in Thai; ‘Bong’ is a kind of bamboo pipe and ‘Fai’ means fire

The origins and purpose of the rocket festivals have been obscured by time but are rooted in stories from Buddhist scriptures.

Rockets were launched to ask the Gods Phaya Thean and the Naga to produce rain for rice farming and as a blessing for a happy life. The ritual combines fertility rites important to agrarian society with Buddhist concepts of making merit. While there are no precise records of when this ritual began, some sources believe it originates with Tai or Dai culture in the Yunnan province of China.

Ask most Thais and they will tell you the object of the rockets is to bring on the start of the rainy season which coincides with rice planting time in the north east of the country. Gambling on the rockets flight time is immensely popular and the reason one can find groups of rocket lovers gathered in the countryside on most weekends regardless of the rice growing season to socialize and spend an afternoon's fun with their bought or self-made rockets.

Most festivals take place in North East of the country, and the province of Sakgeow in the South East near to the Cambodian border, as well as in Laos. A day before the rockets are launched, elaborately decorated Bamboo rockets are paraded through the streets on ox carts or more often on floats.

These rockets are made as were the traditional rockets from centuries ago and are seldom capable of flight. Many are decorated with garlands of flowers and brightly painted Naga heads.

Rockets in various forms were also used in warfare between the 15th and 16th centuries against Elephants during the Burmese Siamese wars of Ayuttaya between 1592 and 1605. There are many descriptions in old texts of rockets being fired in salvos and as incendiary devices against Burmese forces laying siege to Ayuttaya. Spanish mercenaries were also employed during this period for their knowledge of cannon and gunpowder manufacturing.







Rockets have a flight time from 3 to well over 5 minutes and the bigger ones can reach an altitude of over 30,000 feet. In recent years moves have been made to try and restrict the size of the rockets and the unofficial events where they are launched due to fears regarding aviation safety and the serious accidents that occur each year from returning spent rockets or rockets exploding on or after launch

Rockets come in many sizes ranging from small bottle rockets made from tissue paper and banana leaves to giants weighing over 1000kg Size designations are given that follow the Thai words for thousand, ten thousand and million. Rockets under 10 Kg are known as Bong Fai Noi, and bigger ones Muen 20 to 100 kg, Sen 120 to 300 kg and lann 700 to over 1000 kg.

Materials

Rockets of bygone days were made from bamboo tubes wrapped with layers of burlap-type cloth and hemp rope soaked in glue to give them strength, though these days all sizes are made using PVC water pipes of various diameters. Stabilizing sticks are still made from Bamboo as in the past.

Propellant Composition.

The composition used in all rockets weighing over a few hundred grams is a very slow burning rough mix of Potassium Nitrate and Charcoal. The mix contains no Sulphur. Using Sulphur as in a true gunpowder composition, or use of a fine Nitrate/Charcoal mix would result in the rocket exploding on launch or shortly after lifting off from the launch ramp.

Small rockets, in what we would call the one, two and three pound sizes, do contain Sulphur but the mix is far coarser than that which we are used to and all have a core drilled into the composition.

Both the Nitrate and Charcoal are very coarse in all rockets over 1 inch ID. The exact mesh breakdown is given in the building tables for a 2 inch ID size.

On rockets 2 inch ID and over, apart from the main composition, 2 special mixtures are also loaded into the tube before the main propellant mix.

These special mixtures serve 2 purposes. The first delivers a burst of hot fast gas production that is designed to clean out some of the residual solid combustion products from the tube to make the tube as light as possible. Since the competitive side of the rocket's launch is to attain the longest flight time, a lighter spent tube will in theory return to earth at a slower rate resulting in a longer flight time. The second special mix is designed to cause the rocket to slow down in the final 15 seconds of ascent and coast so as to adopt a horizontal position once the main propellant fuel is spent. Thais call this mixture ‘the brake’, and this is a slower burning mix than the ‘cleaner’ or main propellant.





Large press for the pressing of 300kg and larger rockets

In the days before hydraulic presses, rockets were rammed using wooden or steel rammers and sledge hammers.

These days all rockets, even the small ones, are made using hydraulic presses, some capable of exerting over 100 tons per square inch on the composition.

The plastic pipes are first inserted into the center of an oversized steel pipe, and the pipe filled with fine dry sand.

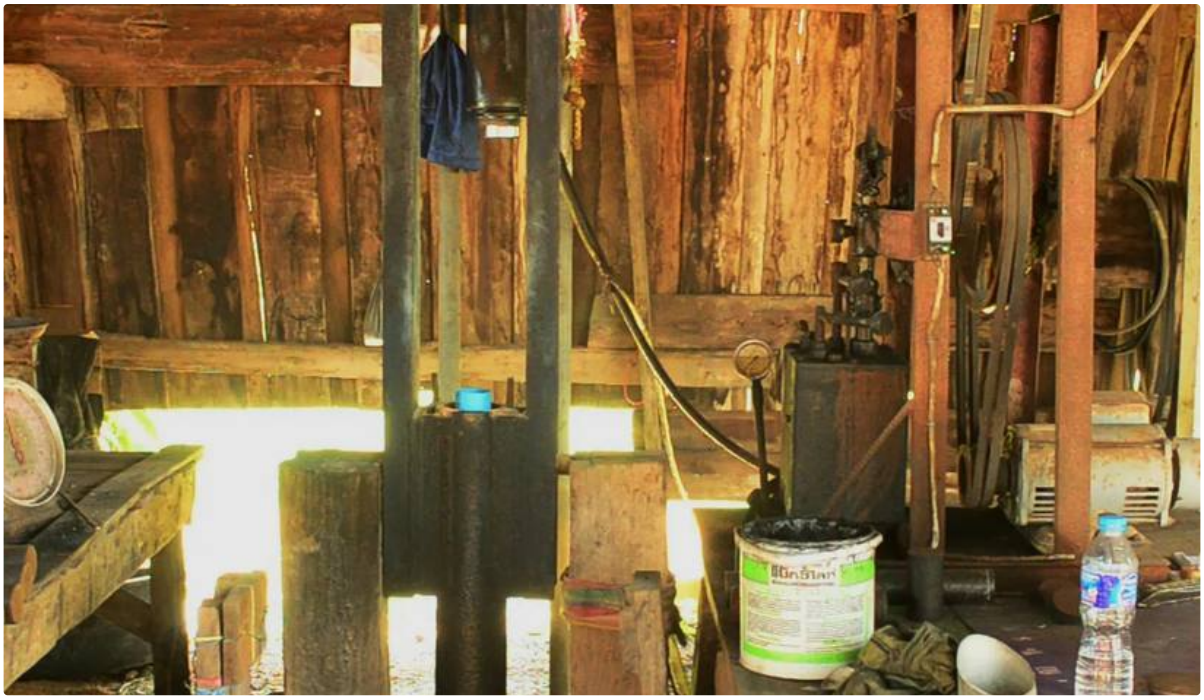
This tube support keeps the PVC tube from overstretching or splitting.

The grade of PVC used for these rocket tubes is the same as is used for water pipes and has a large percentage of plasticizer. As such it not as brittle as many other types of PVC pipe.



Workers sit on a gantry where the press ram is located. The base of the sand filled pipe sits on steel plate bolted to the floor below. The rammer are inserted and removed from the PVC pipe between increments using a chain and pulley.

Rockets in the Lann category, 700 to 1000kg in weight, can take a week or more to press while a 7 kg Bang Fai Noi takes just a couple of hours.



This is a typical arrangement for a smaller press unit capable of exerting around 8000 PSI on the composition. The ram piston is usually in the 2-1/2 to 3-1/2 inch diameter range. This size of press is used in the 2 inch ID rockets. The ram is located on a sliding gantry so it can be moved away from the top of the rammer each time the rammer is removed to put a new increment of composition into the tube.

Nozzles.

Rockets have a ‘double nozzle’ arrangement.

First an increment of Bentonite clay is pressed into the tube, followed by a tight fitting wooden nozzle usually made from Teak wood or less commonly Mai Deang, which means ‘red wood’ in Thai.

Teak is used not only for strength but also its fire resistant qualities.

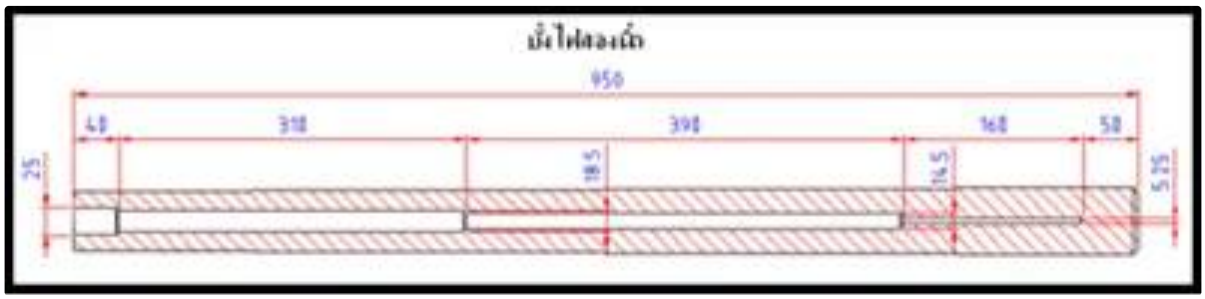




View of Teak nozzle pressed into place; the Bentonite clay layer is visible inside and needs to be drilled out along with the propellant's core.

Drill bit used for the Clay layer

Drilling Out the Core



The core is drilled out throughout the length of the pressed tube in 3 steps, each step larger than the previous as shown in the diagram.



A 1/8 inch pilot hole is first drilled almost to the end of the bore to guide subsequent drill and spade bits.

A 1/4-inch drill is then used to enlarge the hole to a depth of around three-fourths of the propellant's length.

These initial holes are drilled using an electric hand drill.

The rocket is placed in a jig, at the head of which is placed a water cooled guide device to keep the drill bit straight and the drill-bit/comp wet and cooled so the friction produced does not ignite the composition.



Lots of variations of the drill bit jig exist. An enclosed type is shown above, where water is gravity fed into the enclosed cylinder that guides the drill

They all serve the same purpose of keeping the drill straight and cool.



The larger holes comprising the 3 stepped core are drilled out using a spade bit welded to the end of a steel rod. The tube is positioned over the bit and held in place loosely by a couple of rings welded to the support post. The tube is held firmly and turned while applying downward pressure till the correct depth is achieved.

This step is repeated for each of the bit sizes 1/2 – 3/4 – 1 inch.





Drilling the main core sizes by hand with a spade bit.

Stabilizing Stick

Sticks are always made from Bamboo. The bamboo is first baked inside a large PVC or steel tube, then charred in a charcoal pit. This heat treatment serves two purposes, the first is to dry the stick and make it lighter, the second is to remove bends in the length and straighten the stick. Sticks are typically 2 ½ times the length of the rocket body. The stick is balanced in such a way that once the fuel is spent, the rocket will not come down nose first but rather float down in a horizontal position.



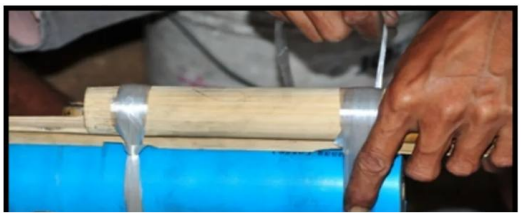


Attaching the Stick

The rocket is first fitted with a shaped piece of Bamboo the length of the tube on which the stick sits. A combination of wire and synthetic string is used to bind it to the tube. Once bound tightly to the rocket body a thin piece of poly/cotton string is laid all along the junction of the stick and rocket body and this string is soaked in super glue.









Cleaning the Bore



This is a critical step in the rocket's construction. Wooden rods of different diameters are wrapped in wet cloth (fabric taken from a monk's robes) and the rough surface of the composition inside the bore is smoothed out so there are no tiny cracks or pinholes on the surface of the core. The steps between each sized hole within the core are given a connecting taper.

During these cleaning procedures the amount of water used varies from builder to builder. Some only wet the cloth used, while others pour quite large amounts of water into the bore. One would have thought this wetting would render the composition un-ignitable, but the composition is so highly compressed as to absorb very little of the water used in the process. Some rocket makers use condensed milk and other substances to wet the cloth instead of, or as well as water. The cleaning process is always carried out just prior to the rocket's launch. Rockets left for a long time before being launched after the cleaning process often fail.



IGNITION SYSTEM



A small wad of steel wool is tied onto the end of a thin Bamboo stick long enough to reach a point ¾ up the inside the bore to the point where the 1/8 inch holes starts. Thin electrical wires are positioned on adjacent sides of the steel wool, and a small plastic bag containing

around a gram of gunpowder is tied around the steel wool. The wires run down the length of the stick and out of the rocket's nozzle. At ignition time the wires are touched to the plus and minus terminals of a 12 volt car battery, the wire wool glows red hot and the powder ignites.

Launch Method.

Rockets are launched from a ramp inclined at a 70 to 80 degree angle. Often they are just made from lashed together lengths of Bamboo to make a crude frame.

Larger permanent steel framed launch ramps are also seen at venues where the launch is a yearly event, or the rockets are too big and heavy to be supported by a bamboo framework.

Pulleys, winches and sometimes cranes are used to pull the rockets onto the launch ramps.





The rockets are lashed to the framework using chains, rope, and grass or Banana leaves, and held tightly enough that some considerable thrust is allowed to develop before the rocket overcomes the constrains of the ties and lifts off



Often washing-up liquid is poured over the tied-on vegetation to provide lubrication and just the right amount of slip



Competition Rules.

Rockets are entered into competition classes based solely on the size of the PVC tube used in their construction. The tubes for each class of rocket must all be the same length and ID; other than that anything goes.

Stabilizing sticks can be as long or as short as you like and double sticks, although never seen, could also be used. Any kind of propellant mixture can be used, as can any kind of bore, pressing pressure, and nozzle arrangement. Parachutes or other mechanical braking devices are not allowed.

The rocket flight time is recorded from the moment of ignition to the moment when the judges deem the rocket to have returned to earth. At every festival a number of Judges can be seen sitting in deck chairs armed with binoculars and stopwatches. The longest time recorded wins.

Flight times vary from size to size, but range from around 4 minutes to over 6 for some of the larger rockets. They can return to earth as far as 5 Km from the launch site.

I only know about the distance because when Jesse Ververka was out here filming for 'Passfire' we hooked up a GoPro camera to a 300 kg rocket along with a mobile phone with a downloaded GPS app and a letter with our phone number offering a reward to the finder.

As soon as the rocket was launched we jumped in my truck and started driving towards where google maps live feed told us it was located.

We lost the phone link around 20 minutes later when it had already come down and were unable to pinpoint the exact location but it was just over 5 miles as the crow flies from the festival site.

Later that afternoon the phone started transmiting a signal again, we called the number, a Cambodian farm worker answered and told us it had come down in the sugar cane field he was working in, Later he came to the rocket festival with the phone and camera intact and claimed his reward.

This picture is of the guy who found it, looking down at the rocket. It was retrieved from the GoPro which was still recording after it hit the ground. A great day for him...the reward was equal to a weeks salary for him.



Here are some examples of the manufacturing process:

Watch the video

Scan the code, or visit https://www.youtube.com/watch?v=LnFy2Rr36i8

Coming in Part 2

Complete and comprehensive step by step instructions on building a 2inch diameter 7 Kg rocket in the traditional Thai fashion with diagrams, videos and composition mesh size analysis.

UNCATEGORIZED

Read it online

With the videos and comments: https://www.westernpyro.org/blog/thai-rockets-part-1-paul-moulder

NEWS · AUG 28, 2025

We're not peeling potatoes here



Time to take another look at fireworks safety

July 26, 2024 Elin Pelin, Bulgaria

I stole the title of this article from a presentation put on by Charley Weeth at the Western WinterBlast® 2024. This seminar went through perhaps a couple dozen accidents which happened all over the world since 2000. The accidents described by Charley were all a result of ematch/quickmatch interactions. In this hour long presentation I think we were all wondering, did people know that there was maybe one incident a year like this for the last 20 years?

The recent accident in Yolo County CA which claimed the lives of seven employees of Devastating Pyrotechnics appears to follow the pattern of a crew preparing fireworks for the 4th of July and either cutting ematch out of already matched devices so they could be hand

lit, or installing ematch into quick match without the benefit of plastic safety couplers. In this case the fact that the operation was carried out in a storage building loaded with product, and perhaps 40-50 containers in the area surrounding caused the resultant explosion to be quite large.

On the morning of July 4, 2009, preparing for a 40-minute display on Ocracoke Island for South Carolina-based Melrose South Pyrotechnics. Crew was attaching ematch to devices inside the truck with the whole show in the truck with them . Four people died in this one.



In days of old, when knights were bold, the first ematches appeared. Without shroud. Friction accidents resulting in bad outcomes got people to thinking about a plastic shroud that fit around the ematch to protect it from friction and perhaps some from being crushed (by snippers) as well.

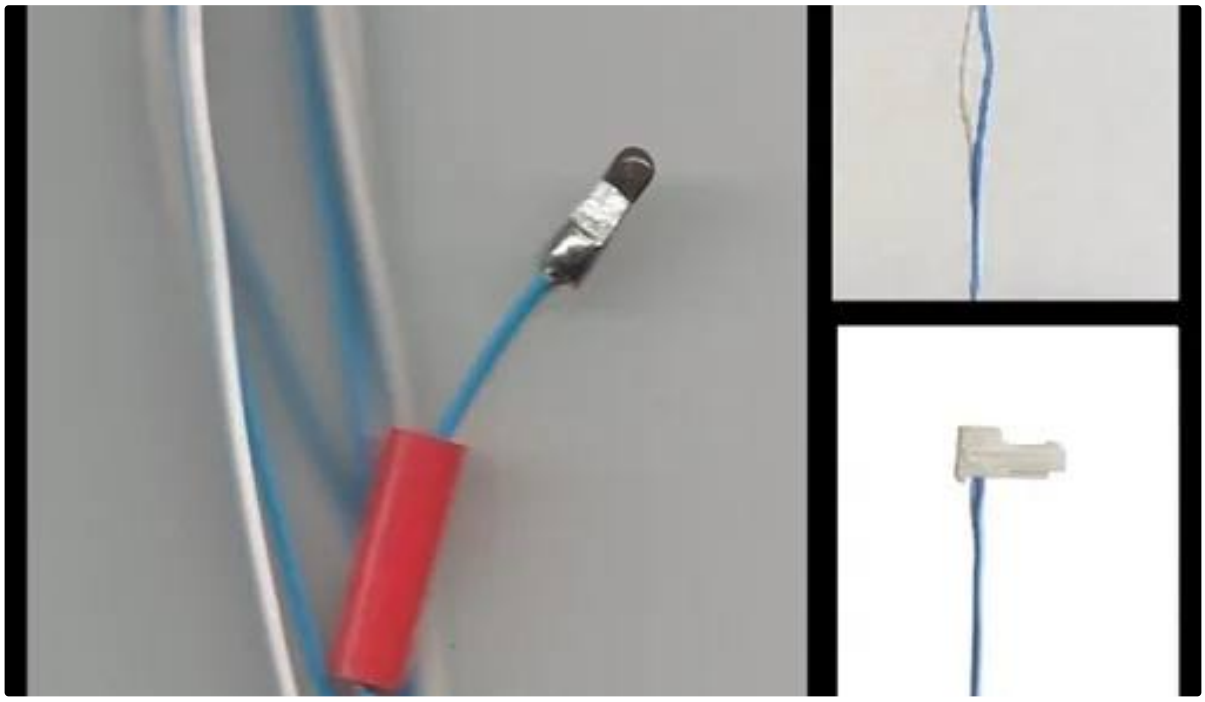
Yep no shroud but that CE mark makes me feel safe. /s

Photo courtesy MJG enterprises

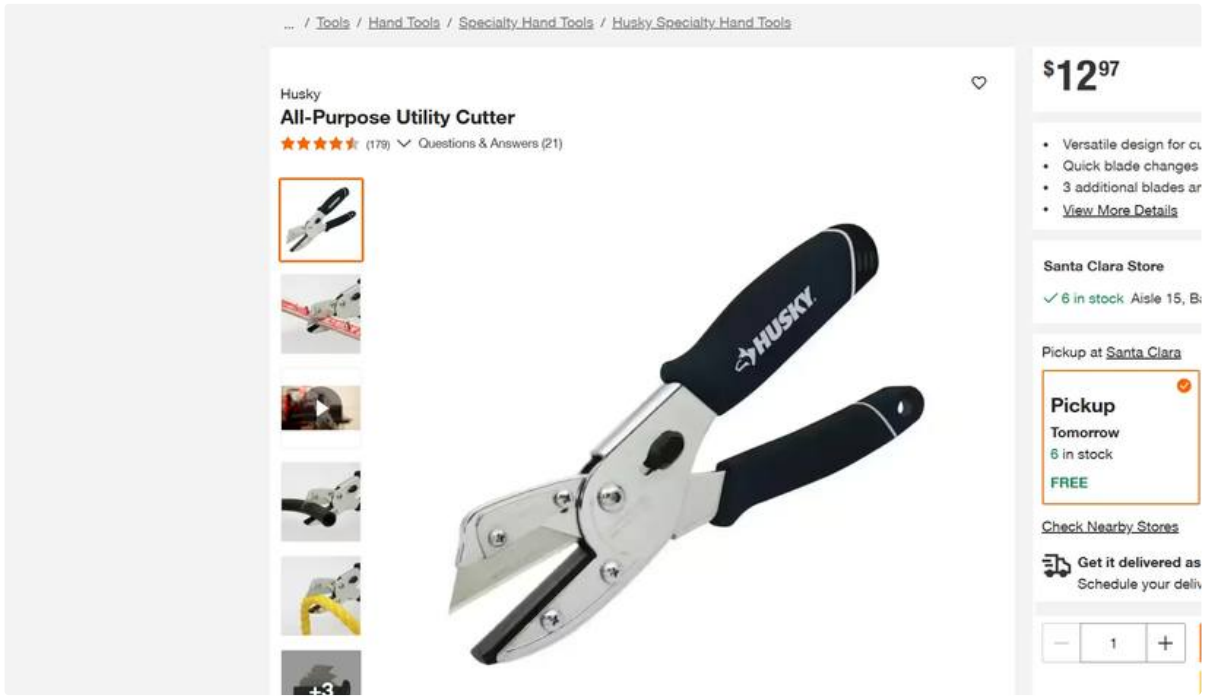


The plastic shroud definitely helped, and when used in conjunction with a plastic coupler which allowed the ematch to make a fire connection without touching the black match inside the pipe, became more or less idiot proof.

But you know how the saying goes, if the device is idiot proof, we then invent a better idiot. The quickmatch in some cases may be cut with scissors, tin snips (I'm afraid I have been guilty of this) or stapled to the rack. Stapling has been known to ignite quick match as well. Some QM based on perchlorate has also allegedly washed up on our shores and may contribute to friction sensitivity.



If the QM does need to be cut in some places the use of an anvil cutter will prevent the friction and pressure from both edges of scissors or wire snippers.



Since the qmatch/ematch has ended in tragedy so often, one must ask the question what else can be done. The answer is when preparing fireworks devices, take steps that if it does go off, it cannot set off other devices. So squibbing inside a truck with the whole rest of the show inside, inside a building or magazine filled with other shells is a super bad idea.

Shells can be placed in the individual mortar tubes and ematched at that time. If they ignite, they just go up into the air rather than go off on the ground and throw sparks and stars and set off all other material in the vicinity. Keep the doors of the magazine closed.

Its worth repeating the key rules of manufacturing and discharge of fireworks :

1. Keep MINIMUM amounts of material out. Yes things will go slower but its better than the alternative.
2. Keep distance from other manufacturing sites.
3. Always keep situational awareness. What if something inadvertantly lights?



In the last 34 year of PGI/WPA/Commercial shows, what safety lessons have we learned?

1. Don't leave metal bowls of comp out in the sun.
2. Don't leave GMC suburban windows open with product on the front seat.
3. Flash can be tricky. Flash dancing on an ashphalt track may result in missing toes. No swing dancing, no flash dancing on the flash. Swing tanzen on the flash verboten.
4. Armstrongs mixture can be even trickier. Please do not drive around town with it.
5. Be careful not to get your rocket rammer lodged on the spindle.

6. Drinking tequila and lighting rockets whilst holding them in hand, muy peligroso, especially in Mexico.
7. If you shoot a large rocket with a flash header in some random place in the desert, there is some finite chance it will land on a brand new $200k RV parked on some other random place in the desert.
8. Large caliber mines with chlorate stars may be more exciting than you want.
9. Large italian shells that have been partially eaten by termites may be more exciting than you want.
10. Even little burns hurt like hell.
11. Stay safe and alive - for your family and friends sake if nothing else!





Watch the video

Scan the code, or visit https://www.youtube.com/watch?v=ILWSp0m9G2U



And now I'd like to turn it over to Mr. Charley Weeth:

Below is my list of fireworks incidents that involved or likely involved the installation, removal or handling of fireworks and electric matches between 1997-2024. It is by no means comprehensive because many incidents are near misses and there is only scuttlebutt. Or the incidents were not reported in the news. Or it is not clear from the public information whether electric matches were involved or not (e.g. Someone making fireworks bs preparing for a show or removing electric matches after a show). Often the only real clues are:

> *the fireworks display(s) will be or was fired electrically fireworks were being prepared, handled or disconnected, or some other activity involving electric matches.*

LIST OF INCIDENTS INVOLVING ELECTRIC MATCHES & FIREWORKS 1997-2025

> *July 25, 2024 - Elin Pelin, Bulgaria - 4 dead and significant property damage July 4, 2023 - Gilmore, TX - 1 dead and some property damage December 1, 2022 - Orlando, FL - 4 dead, one severely burned and significant property damage July 4, 2021 - Ocean City, MD - A few minor injuries and some*

> *property damage June 5, 2019 - Roswell, NM - 1 dead, 1 severely injured and 10 injured with 1 building destroyed June 30, 2017 Slatington, PA - 1 severely injured and some property damage July 31, 2015 - Palo Duro Canyon, TX - 1 dead and some property damage October 7, 2014 - Maytown, PA - A few minor injuries and significant property damage July 3, 2014 Comanche, TX - 1 dead and some property damage June 18, 2014 - Tenino, WA - 1 dead ,1 inured and some property damage August 31, 2012 - Lake Elsinore, CA - 1 dead ,1 inured and some property damage July 4, 2009 - Ocracoke Island, NC - 4 dead, 1 injured and some property damage June 8, 2008 - Waconia, MN 1 injured and significant property damage December 3, 2006 - Marlie Farm, East Sussex, UK - 2 firefighters killed, 2 police officers and 2 neighbors injured and extensive property damage August 18, 2005 - Crestline, KS - 3 dead, 1 severely injured and 1 injured and some property damage November 3, 2004 - Seest, Denmark - 1 firefighter killed, 7 firefighters and 17 neighbors injured with extensive property damage July 3, 2003 - Kilgore, TX - 3 dead, 5 injured and extensive property damage July 2, 2003 - Bonita Springs, FL - 5 dead, 1 injured and some property damage March 6, 2002 - Carmel, Western Australia - 2 minor injuries and extensive property damage December 31, 1998 - New Orleans, LA - 2 dead, 1 critically injured and some property damage June 5, 1997 - La Follette, TN - 4 dead and extensive property damage*

2025 Incidents Here are news links to known incidents in 2025 involving the preparation of electrically fired fireworks displays. The tragedy in Esparto has not yet been reported to have involved the preparation of fireworks displays with electric matches, but given it occurred July 1st and the company had electrically fired shows booked for the season, it is the most likely scenario. **CAPE COD, MA** 4 people injured after fireworks discharge at golf course on Cape Cod Investigation ongoing after fireworks explode ahead of show at Cape Cod golf course Accidental ignition to blame for Mashpee fireworks explosion that hospitalized two, officials say Preliminary findings announced amid investigation into Mashpee fireworks explosion Mashpee firework inspection was 'flawless' before explosion. What we know a week later. **WEST WENDOVER, NV** West Wendover cancels fireworks display after multiple injured in accidental detonation **TUSKAHOMA, OK** Fireworks explosion in Tuskahoma critically injures 3 — here's what we know 3 in critical condition after fireworks explosion and fire Everything we know about the Choctaw Nation explosion victims Fireworks fire victim dies after Tuskahoma explosion **ALBUQUERQUE, NM** Friend of victim hopes to set record straight on home explosion in NE Albuquerque AFR: 2 injured after explosion starts home fire in NE Albuquerque ATF now investigating explosion involving

fireworks inside home Fireworks company releases statement after explosion injures 2 people in Albuquerque Man killed in Albuquerque home explosion was longtime pyrotechnician Two incidents occurred at the display site and were outside. One incident occurred in some type of park building and the other in a residential garage. **Note**: The two fatalities (so far) occurred at the incidents inside a structure. A structure confines the blasts and the fires, which accelerate the series of explosions as well as increase the damage inflicted on any humans inside. In some instances people may survive their blast and burn injuries but later succumb due to infections or other secondary issues. **INVESTIGATION REPORTS** Here are some of the best investigations into incidents involving the installation and removal of electric matches to/from fireworks.

> *The Carmel fireworks explosion: Report*

> *A Report on the Fireworks Accident at Carmel, Western Australia*

> *Marlie Farm significant findings report*

Unfortunately in the USA the ATF primarily determines if the incident was accidental or criminal with the cause secondary. OSHA primarily looks for violations, also with the cause secondary. **DISCUSSION**
Determining the actual cause is always a challenge, especially if there are no survivors. Even if there are survivors, they may not really know exactly what happened because they were looking at something else, or it happened so quickly, or the trauma.

Often the best we can do is determine the most likely cause based on what the activity was at the time.
If the activity involves electric matches, impact and friction are the most likely culprits for the initial ignition. ESD is also a possibility but not as likely because the conditions must be just right.

It is always interesting to me that there are folks that argue electrically fired displays are somehow "safer" than manually fired displays. Many have never or will never shoot display fireworks manually. Electrically fired displays are not safer than manually fired displays because it all depends on how everything is done. I'd rather manually fire and reload a show with a crew that is experienced, knows what they're doing and follow safe practices than electrically fire a show with a crew that lacks experience and thinks they know what they are doing and doesn't follow safe practices. Electrically fired displays have different risks and hazards than manually fired displays. Knowing what those risks and

hazards are and how best to mitigate and minimize them are the keys. Eliminating all the risks and hazards is impossible, so the best one can do is make the worst case scenarios SURVIVABLE! Blaming people for removing the shrouds or mishandling the fireworks with electric matches is only one part of the equation. Even the most experienced or careful pyro can have a shell with an electric match attached roll of a worktable or a host of other normal FOOPAs. The two keys to making that scenario survivable is to limit the quantity of fireworks to a single shipping carton and limit the number of people in one place at one time with that single shipping carton of fireworks - with all the other fireworks safe in a magazine, day box, box truck or trailer with the doors closed. (ATF minimum distances are 200 feet but 300 feet is better). WHINING: "But that's too far away. It is too hard and takes too much time! Besides the ATF determined installing electric matches is not manufacturing" No, there is plenty of time, just change the plan to the reality of the situation, manage the risks and hazards. And yes the ATF determined the installation of electric matches is not manufacturing, and thus an ATF Manufacturer's License is not required. However, all of the other standards such as types of buildings, maximum quantities and minimum distances remain applicable. See July 2017 ATF Newsletter. Besides nothing is harder than spending months in the burn unit and a lifetime of disfigurement and pain ..... or attending closed casket funerals!

UNCATEGORIZED

Read it online

With the videos and comments: https://www.westernpyro.org/blog/were-not-peeling-potatoes-here

NEWS · MAY 5, 2025

It was 20 years ago today

we going to hold hands and sing 'Kum-by-yah'?" Even worse, we had to talk about ourselves. The rest of the group prattled on about their great, fantastic lives. When it was my turn, I just said that I lead a very quiet and boring life. "Come on", one of the women said. "You must do something interesting?" The kid gloves came off. I gave a four-minute soliloquy about the WPA, fireworks in general, how I was going to Lake Havasu City that coming weekend for Western Winter Blast, and a very detailed description of WWB. "You win," responded one guy. "I wasn't trying to," I shot back. "Winterblast?", queried one of the women. "Isn't that a flavor of gum?"

I left Phoenix, on an endless trek thru dimly lit convenience stores and lonely truck stops in search of Winterblast (the place, not the gum). Over the horizon on Arizona 95 a white tent rose from the barren tundra (it gets cold sometimes). An eclectic assortment of figures was clustered around it, some with hard hats, and others in spirited discussion. I had found it!

I saw a few familiar faces as I signed up and received my credentials. The site was set up perfectly, nothing out of place. Since there was no sign of Major Nelson and Jeannie, I

both the SARA park site and spectator point.

The days had many fine seminars. I enjoyed the spider shell building; the instructor's explanation of black powder classifications was very informative. It was a nice tangent, and a lot of people were taking detailed notes. The other seminars were well attended, with all the participants thanking the instructors for giving their time to share their knowledge and keep the fires lit, so to speak. I don't do any manufacturing, but I still like to wander thru, it gives me a chance to meet other club members, and check out their area of expertise. It is also interesting to see how things are put together, and compare different techniques used by various people. The trade show at the aquatic center couldn't be missed, the vendors working very hard to provide pyro related items. The business meeting was packed, and congratulations to our new president Russ Laurie, and our new treasurer, Alicia Ledbetter. I always enjoy the afterglows, each year they get bigger and better. I guess next year will be the coq-au-vin and the pheasant under glass.

Oh yeah, I think we shot some fireworks, too. I always enjoy the displays. Bill Page from Silverado

was rocketing back to the Valley of the Sunstroke. My boss joked if I had all ten fingers when I returned to work. HA HA! I'm sure none of you get that one at your jobs. It was a very good WWB, and I hope to see you all at Do-It (wherever we hold it).

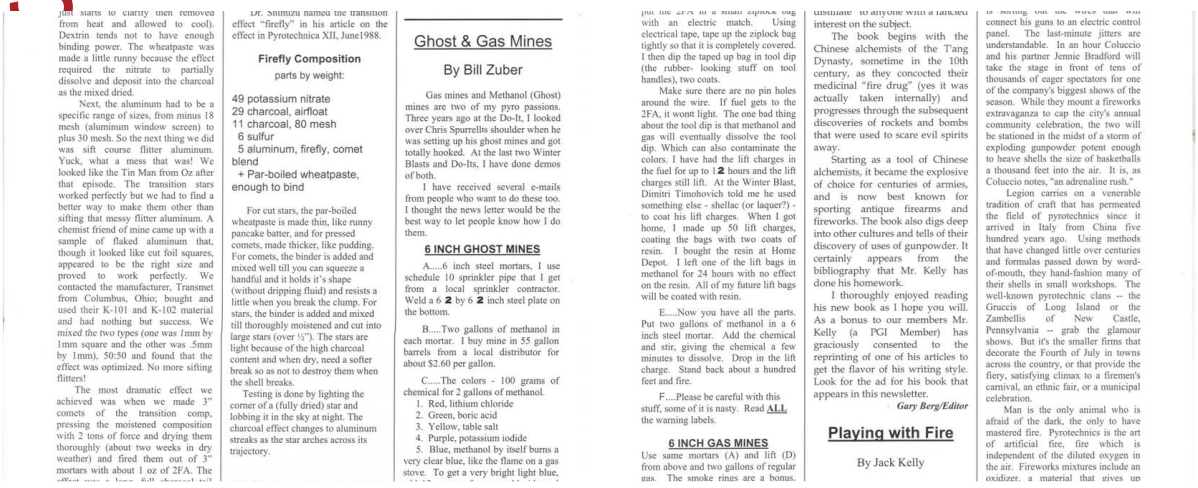
The Firefly Effect

by Steve Majdali ©2-28-04

It was either the 1986 or 1987 PGI Convention when many of us western pyros were captivated by the 'charcoal-to-aluminum-transition' stars, as they were called. A shell would lift and upon breaking a wonderful charcoal spider would develop, but before long the hanging charcoal tails would start to flicker with small white streaks which would appear randomly as the embers would drift slowly downward. Wow, what an elegant effect! We asked how it was done, but no one would tell us, other than it was Jerry Taylor's creation and they were all sworn to secrecy.

This wouldn't do, so one of us Southern California guys took the challenge and worked tirelessly with whatever clues he could get out of

gt Pepper taught the band to play


just starts to clarify then removed from heat and allowed to cool). Dextrin tends not to have enough binding power. The wheatpaste was made a little runny because the effect required the nitrate to partially dissolve and deposit into the charcoal as the mixed dried.

Next, the aluminum had to be a specific range of sizes, from minus 18 mesh (aluminum window screen) to plus 30 mesh. So the next thing we did was sift course flitter aluminum. Yuck, what a mess that was! We looked like the Tin Man from Oz after that episode. The transition stars worked perfectly but we had to find a better way to make them other than sifting that messy flitter aluminum. A chemist friend of mine came up with a sample of flaked aluminum that, though it looked like cut foil squares, appeared to be the right size and proved to work perfectly. We contacted the manufacturer, Transmet from Columbus, Ohio; bought and used their K-101 and K-102 material and had nothing but success. We *mixed the two types (one was 1mm by* 1mm square and the other was .5mm by 1mm), 50:50 and found that the effect was optimized. No more sifting flitters!

The most dramatic effect we achieved was when we made 3" comets of the transition comp, pressing the moistened composition with 2 tons of force and drying them thoroughly (about two weeks in dry weather) and fired them out of 3" mortars with about 1 oz of 2FA. The

Dr. Shimizu named the transition effect "firefly" in his article on the effect in Pyrotechnica XII, June1988.

Firefly Composition

parts by weight:

49 potassium nitrate
29 charcoal, airfloat
11 charcoal, 80 mesh
6 sulfur
5 aluminum, firefly, comet blend
+ Par-boiled wheatpaste, enough to bind

For cut stars, the par-boiled wheatpaste is made thin, like runny pancake batter, and for pressed comets, made thicker, like pudding. For comets, the binder is added and mixed well till you can squeeze a handful and it holds it's shape (without dripping fluid) and resists a little when you break the clump. For stars, the binder is added and mixed till thoroughly moistened and cut into large stars (over ½"). The stars are light because of the high charcoal content and when dry, need a softer break so as not to destroy them when the shell breaks.

Testing is done by lighting the corner of a (fully dried) star and lobbing it in the sky at night. The charcoal effect changes to aluminum streaks as the star arches across its trajectory.

Ghost & Gas Mines

By Bill Zuber

Gas mines and Methanol (Ghost) mines are two of my pyro passions. Three years ago at the Do-It, I looked over Chris Spurrells shoulder when he was setting up his ghost mines and got totally hooked. At the last two Winter Blasts and Do-Its, I have done demos of both.

I have received several e-mails from people who want to do these too. I thought the news letter would be the best way to let people know how I do them.

6 INCH GHOST MINES

A.....6 inch steel mortars, I use schedule 10 sprinkler pipe that I get from a local sprinkler contractor. Weld a 6 **2** by 6 **2** inch steel plate on the bottom.

B.....Two gallons of methanol in each mortar. I buy mine in 55 gallon barrels from a local distributor for about $2.60 per gallon.

C.....The colors - 100 grams of chemical for 2 gallons of methanol.

1. Red, lithium chloride
2. Green, boric acid
3. Yellow, table salt
4. Purple, potassium iodide
5. Blue, methanol by itself burns a very clear blue, like the flame on a gas stove. To get a very bright light blue,

put the 2FA in a small ziplock bag with an electric match. Using electrical tape, tape up the ziplock bag tightly so that it is completely covered. I then dip the taped up bag in tool dip (the rubber- looking stuff on tool handles), two coats.

Make sure there are no pin holes around the wire. If fuel gets to the 2FA, it wonst light. The one bad thing about the tool dip is that methanol and gas will eventually dissolve the tool dip. Which can also contaminate the colors. I have had the lift charges in the fuel for up to 1**2** hours and the lift charges still lift. At the Winter Blast, Dimitri Timohovich told me he used something else - shellac (or laquer?) - to coat his lift charges. When I got home, I made up 50 lift charges, coating the bags with two coats of resin. I bought the resin at Home Depot. I left one of the lift bags in methanol for 24 hours with no effect on the resin. All of my future lift bags will be coated with resin.

E.....Now you have all the parts. Put two gallons of methanol in a 6 inch steel mortar. Add the chemical and stir, giving the chemical a few minutes to dissolve. Drop in the lift charge. Stand back about a hundred feet and fire.

F.....Please be careful with this stuff, some of it is nasty. Read **ALL** the warning labels.

6 INCH GAS MINES

Use same mortars (A) and lift (D) from above and two gallons of regular gas. The smoke rings are a bonus.

distillate to anyone with a fancied interest on the subject.

The book begins with the Chinese alchemists of the T'ang Dynasty, sometime in the 10th century, as they concocted their medicinal "fire drug" (yes it was actually taken internally) and progresses through the subsequent discoveries of rockets and bombs that were used to scare evil spirits away.

Starting as a tool of Chinese alchemists, it became the explosive of choice for centuries of armies, and is now best known for sporting antique firearms and fireworks. The book also digs deep into other cultures and tells of their discovery of uses of gunpowder. It certainly appears from the bibliography that Mr. Kelly has done his homework.

I thoroughly enjoyed reading his new book as I hope you will. As a bonus to our members Mr. Kelly (a PGI Member) has graciously consented to the reprinting of one of his articles to get the flavor of his writing style. Look for the ad for his book that appears in this newsletter.

Gary Berg/Editor

Playing with Fire

By Jack Kelly

connect his guns to an electric control panel. The last-minute jitters are understandable. In an hour Coluccio and his partner Jennie Bradford will take the stage in front of tens of thousands of eager spectators for one of the company's biggest shows of the season. While they mount a fireworks extravaganza to cap the city's annual community celebration, the two will be stationed in the midst of a storm of exploding gunpowder potent enough to heave shells the size of basketballs a thousand feet into the air. It is, as Coluccio notes, "an adrenaline rush."

Legion carries on a venerable tradition of craft that has permeated the field of pyrotechnics since it arrived in Italy from China five hundred years ago. Using methods that have changed little over centuries and formulas passed down by word-of-mouth, they hand-fashion many of their shells in small workshops. The well-known pyrotechnic clans -- the Gruccis of Long Island or the Zambellis of New Castle, Pennsylvania -- grab the glamour shows. But it's the smaller firms that decorate the Fourth of July in towns across the country, or that provide the fiery, satisfying climax to a firemen's carnival, an ethnic fair, or a municipal celebration.

Man is the only animal who is afraid of the dark, the only to have mastered fire. Pyrotechnics is the art of artificial fire, fire which is independent of the diluted oxygen in the air. Fireworks mixtures include an oxidizer, a material that gives up

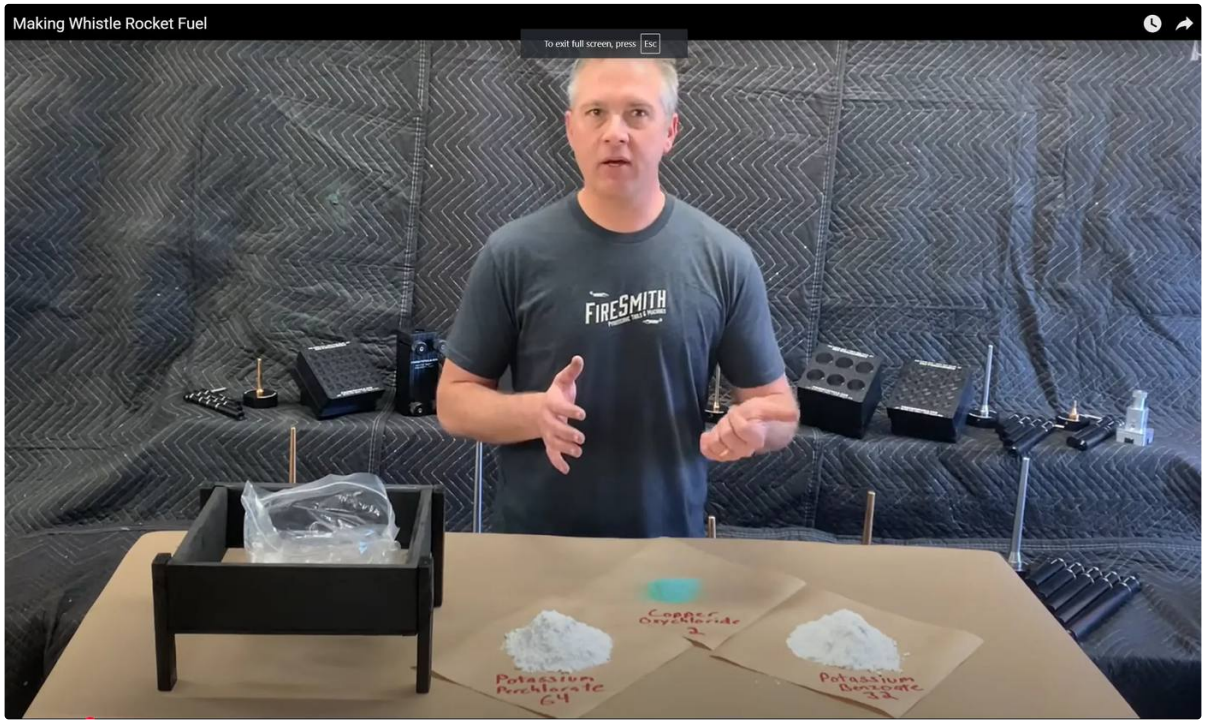
UNCATEGORIZED

Read it online

With the videos and comments: https://www.westernpyro.org/blog/it-was-20-years-ago-today

NEWS · MAY 5, 2025

"Extreme" Whistle Rockets



ot extreme enough if you ask me

Some Do-its ago one of our members, an approximately 7 foot tall hispanic former marine appeared at Do-it. He said his name was "Arbor - just call me Tree".

That's not him in the picture, I didn't have a photo of him so I had to hire an exotic fashion model at great expense to pose with some rockets, which for all I know don't even whistle. Tree if you're out there, send me a picture.

Very friendly chap, off he went and knocked out some whistle rockets in manufacturing. What was unusual or "extreme" about these rockets is that they were able to lift 8 inch headings to great height. But the heading did not go off at apogee, nooooooooooo.

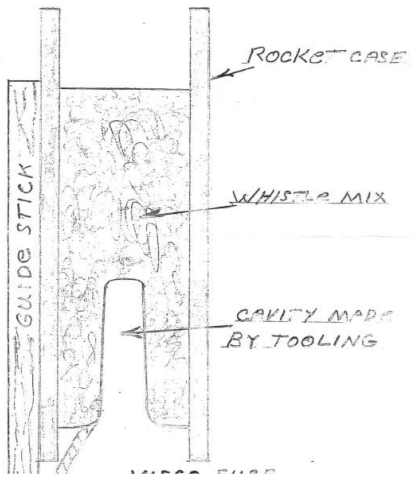
Came back down and went off at maybe 300ft? Very exciting, good effect, what pyrospectaculars used to call "High def" meaning the shell was "low altitude" so it was more in your face.

How is he able to do that, I got to give it a try. But I didn't have a press and I didn't dare pound them out with a dead blow hammer like they do in Mexico. I was more into building cylinder shells in those days anyway, but finally a Carver lab press fell into my hands for next to nothing. I was able to modify it into a car battery powered rocket press with a hydraulic pump acquired from craigslist. This was cool because I could put down the tailgate of my truck and have a mobile rocket operation.

I had some rocket tools I had bought at PGI which were on the shelf until the acquisition of the Carver press and the hydraulic pump, so I dusted those off at Do-it and gave it a try using the Ben Smith (from Firesmith) formula, that is to say 64/32/2.

Now mind you, these tools I had purchased at PGI were not Firesmith but I thought I would start with the Ben Smith formula and see what happened. And what happened was caca, I could get them to fly, barely, but they couldn't even lift a 3 inch heading.

The handout that came with the tools I bought:



Example = .441 (tool sq. inches) x 6500 PSI (desired pressure) = 2866 pounds. Next 2866 pounds divided by cylinder square inches (2.405) = 1191 PSI gauge pressure.

Recommended Case Lengths for Extreme Whistles

Rocket I.D.	*Case Length*	*Sq. Inch Area of Tool*
½" I.D.	*3-1/2" long*	*.196 sq. inches*
5/8" I.D.	*4" long*	*.307 sq. inches*
¾" I.D.	*6-1/2" long*	*.441 sq. inches*
7/8" I.D.	*6-1/2" long*	*.600 sq. inches*
1" I.D.	*7-1/2" long*	*.785 sq. inches*
1-1/4" I.D.	*8-1/2" long*	*.1.227 sq. inches*
1-1/2" I.D.	*10" long*	*.1.770 sq. inches*

Extreme Whistle rocket Fuel

Potassium Perchlorate	*70%*
Sodium Benzoate	*30%*
Vasoline-additional	*3%*
Iron Oxide-additional	*2%*

Note: When attaching guide sticks it is best to glue and tape to Rocket case, these rockets take off so fast that I have seen them

these rockets must be PRESSED AND NEVER RAMMED using a mallet or hammer etc. In the event of a stuck rammer, do not attempt to twist the rammer loose from the spindle. This may cause an explosion. If a stuck rammer should accrue soak in water and after a while you can remove the stuck rammer by cutting away the case and remove any propellant.

It's best to heed the above advice than to rush and have an accident. There is a chart showing the various diameter rockets, their approximate case lengths, pressing pressures etc. The case length chart is just a guide and your tools have been made to fall into these approximate case lengths. Longer or shorter cases can be cut to suit the individual. The rammers are long enough to accept up to a 1" longer case than listed on the chart. When pressing whistle rockets it's best to add just enough whistle composition to the case to fill it one "inside diameter". Example: If you have a ¼" I.D. rocket case, the composition should rise ¾" in height with each pressing.

Pressing pressures should be 6500 PSI. This does not mean to mash down with your press till the gauge reads 6500 pounds. You have to take in account the diameter of your rocket tooling, the cylinder diameter etc. Example: If your cylinder is 1-3/4" diameter this equals 2.405 square inches. Use the formula below to figure what the pressure gauge should read after factoring in the square area of your tool and the square area of the hydraulic

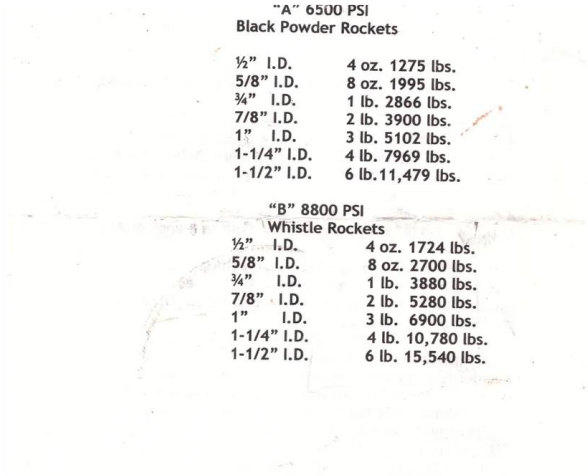
a black powder type mix are pressed to 6500 PSI and rockets that use a whistle mix propellant are pressed to 8800 PSI.

The most common rocket sizes and the square inch area:

4 oz.	½" diameter	.196 Square Inches of Area
8 oz.	5/8" diameter	.307 Square Inches of Area
1 lb.	¾" diameter	.441 Square Inches of Area
2 lb.	7/8" diameter	.600 Square Inches of Area
3 lb.	1" diameter	.785 Square Inches of Area
4 lb.	1-1/4" diameter	1.226 Square Inches of Area
6 lb.	1-1/2" diameter	1.766 Square Inches of Area

This pressure conversion gauge is machined so that the piston area is exactly one square inch in area. This eliminates the necessity of knowing what size hydraulic cylinder your press has.

I have listed the actual pressures for both the Black powder fuels and the Whistle mix fuels for each size rocket. Column "A" is Black powder fuel and column "B" is Whistle mix fuels. Keep in mind that the listed pressure will give you the necessary 6500 PSI and 8800 PSI loading when taking into account the actual square



"A" 6500 PSI
Black Powder Rockets

½" I.D.	4 oz. 1275 lbs.
5/8" I.D.	8 oz. 1995 lbs.
¾" I.D.	1 lb. 2866 lbs.
7/8" I.D.	2 lb. 3900 lbs.
1" I.D.	3 lb. 5102 lbs.
1-1/4" I.D.	4 lb. 7969 lbs.
1-1/2" I.D.	6 lb.11,479 lbs.

"B" 8800 PSI
Whistle Rockets

½" I.D.	4 oz. 1724 lbs.
5/8" I.D.	8 oz. 2700 lbs.
¾" I.D.	1 lb. 3880 lbs.
7/8" I.D.	2 lb. 5280 lbs.
1" I.D.	3 lb. 6900 lbs.
1-1/4" I.D.	4 lb. 10,780 lbs.
1-1/2" I.D.	6 lb. 15,540 lbs.

So I went away, licking my wounds (tasted like perchlorate) made some shells instead whilst thinking about what to try next.

I believe one problem with what I did with the first batch was that the material was not mixed well enough. Everything was ball milled well, but an experienced whistler suggested I push the de-sensitized material through a finer screen like 40 mesh several times with the help of a 3" wide paint brush whose bristles had been cut down to about 1/4". Rather than pushing it through 20 mesh window screen with a delrin scraper. Anyone who has worked with whistle material knows this part is something of a pain because the benzoate has a mind of its own.

One of the video links down at the end shows a man mixing whistle using a kitchen strainer with the usual 20 mesh so maybe its just a matter of running it through the screen more times to get it consolidated. Or spending more time in the mixing phase with the solvent.

The other issue was the formula itself. Ben Smith had advocated 64/32/2 yet the tools I purchased suggested 70/30/1. Yes I know they don't add up to 100, this is pyro, if you want advanced math try Hahvahd, I'm just the messenger.

My friend the whistler suggested trying the more oxider heavy "extreme" formula recommended by the tooling in addition to the finer mesh screening.

If one were to apply "logic" or the "scientific method" one would change one variable at a time. But that's not how we roll around here, we need results god dammit, so I decided to go for the big enchilada.

Result was that the first few rockets blew up. But wait, what about lighting the nozzle as shown in the picture, or as my friend the whistle man suggested, winding the visco around the bottom of the nozzle half a turn. Well that worked, and I was able at least to lift a 4" canister heading!

But I don't think it has the snort to lift an 8". Maybe the next step is to do some static engine tests as shown in the final video link and work out the issues that way first. Plan B, talk to Tree.



Watch the video
Scan the code, or visit https://www.youtube.com/watch?v=V_bSbo35JS0



Watch the video
Scan the code, or visit https://www.youtube.com/watch?v=-m7iu7DgFvE



Watch the video
Scan the code, or visit https://www.youtube.com/watch?v=y_N4CI4D57o



Watch the video
Scan the code, or visit https://www.youtube.com/watch?v=DWPuOM7RtXQ



Watch the video
Scan the code, or visit https://www.youtube.com/watch?v=mzwg0Ojf998

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Read it online
With the videos and comments: https://www.westernpyro.org/blog/extreme-whistle-rockets

NEWS · MAR 16, 2025

Remain in Mexico



WPA luminaries did not get enough in Havasu and travelled to Tultapec Mexico fireworks festival for another fix after the winter blast. And to drum up a bit of business maybe..

Check out the WPA facebook page as well for more pictures and videos.

Pensive pyros at the beginning of the trip: "Yeah man, the world is in a terrible place man. I just get brought down thinking about it man"



Hey look at what I found at the local liquor store!



Hey look what I found at the street vendor down the way!



Hey look what I found at the Toro festival! Well that is definitely a morale booster. What happens in Mexico stays in Mexico unless its so big it comes over the border and threatens the whole state of Texas.



Wait a minute, we're las chicas bonitas Americanas, the whole world revolves around us. We control the audio, we control the video. Tequila, rockets y verga gigante, what more do you need to get in a happy mood.



"I'm in with the in crowd, I go where the in crowd goes.

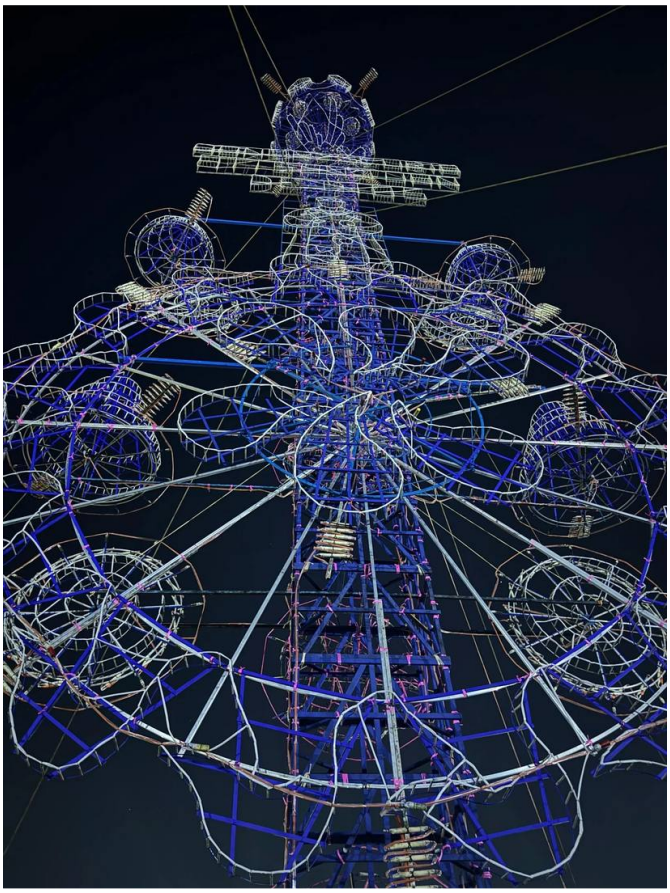
I'm in with the in crowd, and I know what the in crowd knows"



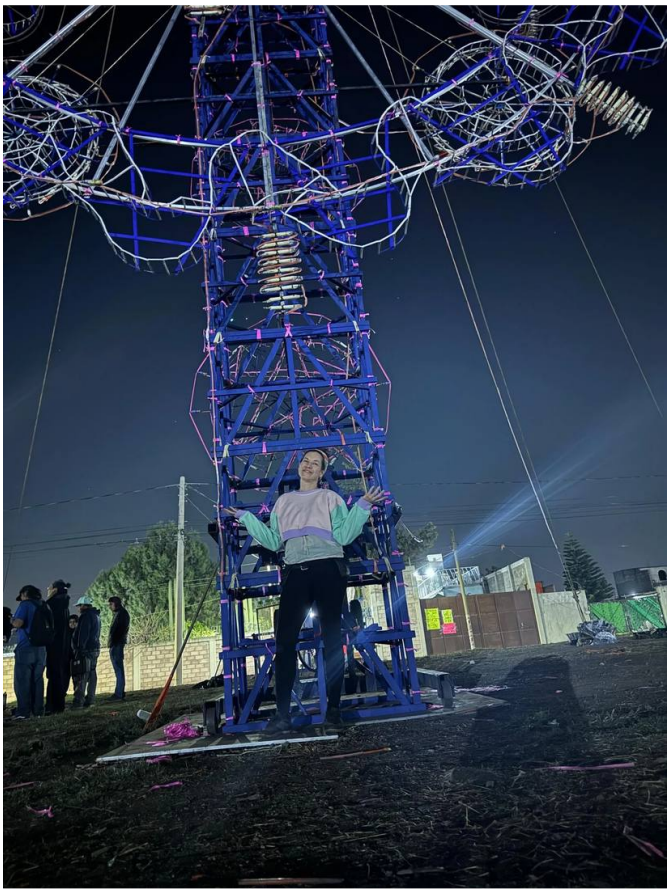
"All dressed up with nowhere to go", Think I'll join an ecstatic mob in the town square then.



Shout out to all those bulls who don't want to be a part of the toxic male masculinity that permeates the bovine patriarchy. There, I said it.



Man that is a big twinkie



Big Castillo. Mi castillo es tu castillo.



Boss lady told me to build this chrysanthemum, la senora Americana, probably going to be a dud gigante because what do girls know about shell building, but fortunately for me its "beer 30" so I can at least get in the mood.



Mass hysteria but of the good kind

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Read it online

With the videos and comments: https://www.westernpyro.org/blog/remain-in-mexico