

June 2013, Vol 24-1

Western Pyrotechnic Association Newsletter



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WPA Newsletter, Volume 24, Issue 1

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Elected Officers of the WPA

President: Lynden King.
VP: Greg Dandurand
VP publications: Pete Hand
Treasurer: Ann Hill
Secretary: Kathy Bauer

IMPORTANT NOTICE

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Combined Specialities

Novato, CA

Extreme Pyro

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Holatron Systems LLC

Honolulu, HI

Pyro Novelties

Lenexa, KS

Pyro Spectaculars

Rialto, CA

Friends of the Fair

Lake Havasu City, AZ

We would like to take this space to express our thanks to our corporate members. These are folks who recognize that the health and longevity of pyrotechnic clubs and organizations is responsible in part of the continued success of fireworks in America. In these economic times, their support can be especially hard on them. It goes above and beyond the standard.

The WPA relies on our corporate members' continued support for the health of our club.

Do us ALL a favor and be sure to use their services.



The Jackalope in Jackalope Gulch

Editor's Remarks

Pete Hand

Wow, half a year gone already! I know what you're thinking - "What took you so long?" A crippling back injury and a couple of months laid up didn't help, but here we are with a new issue stuffed with good things. Lots of Winter Blast reports, the Maker Faire report, and part 3 of Peter Schowe's interesting series on the Firework Factories of India, among other things.

As always, I'm grateful for your contributions of articles and pictures. I can't do this without you.

From the President

Lynden King

Editor's Note: President King is presently being held incommunicado at an undisclosed location, where a spokesman who cannot be named for national security reasons says he is launching non-stop firework displays. The following communiqué was obtained by a Freedom of Information Request to the National Security Agency, which has been monitoring President King's communications with great diligence.

Fellow members of the WPA,

I am addressing you from [REDACTED] in [REDACTED]. I am currently doing all [REDACTED] for [REDACTED] cannot name [REDACTED] end of the world.

[REDACTED] massive quantities of [REDACTED] some [REDACTED] inches which can be seen as far away as [REDACTED] smoke clears [REDACTED]

Wishing all members [REDACTED] July 4th. Do enjoy [REDACTED] sparklers [REDACTED] and try to stay [REDACTED] insufferable heat.

Looking forward to seeing you all at [REDACTED] in late September, by which time I hope [REDACTED]

Lynden King

From the Veep

Greg Dandurand

It is July 4th, I know we are all trembling with anticipation. Please be safe and don't forget to have a good time! It has been a while since we have had a newsletter. If you have any thoughts of being an amateur writer, this is the vehicle for your verbal vomit. Our editor is always looking for pyro related articles, from the light whimsical to serious technical fair. How to articles are always welcome. The WPA newsletter is what you make of it, we can't publish empty pages.

I want to thank Wally Glenn and all those who worked the booth at the Maker Faire event. These are the type of things the members need to be doing to attract new people. We (the Board) can do some things, but the day-to-day operation of the WPA can take up a lot of time. More members equals more hands to help at events.

The web site (or lack thereof) has been a heated topic on the digest of late. We are having a new, more interactive web site built. It will take some time to get everything together, so please be patient. I think it will be liked by everyone. OK, not everyone, but you can't keep everyone happy.

Do-It dates have been confirmed (26-29 September). Please come if you can, it is always a good time. There is also a plan to confirm the Do-It dates for 2014, that will allow for more planning.

WWB is also around the corner. It is the the 25th Winterblast, in addition, it is also the 50th anniversary of Lake Havasu City. Keep that in mind if you have any ideas to put on a demo or a mini display.

Remember that the Board is always there for the members. I (and the others) are willing to listen to your concerns about the club. I can't tell you what color to paint your kitchen or the next car to buy, but we are here for you. Have a pyro filled summer and I hope to see you at Do-It.

From the ~~Desk~~ Recliner of Kathy Bauer, Secretary

Ahhhh...I've recovered from another wonderful WPA event: WWBXXIV.

Thank you all for putting up with the computer and printer crashes of this event. One day all will run smoothly, or should this start with "Once upon a time....things will run smoothly" Until such a time, thank you all for your understanding and smiles.

I will be asking the committee who is looking at the current WPA by-laws to discuss some needed changes to the job of WPA Secretary. At this time it does not reflect the true running of this office. The secretary receives all monies from membership and event registrations, updates sent to all chairman and send the receipts and break downs to the treasurer. Also makes sure the membership chairman knows who will be attending. This part of the job is not reflected in our current by-laws and the next person willing to take this job needs to know the true working of the office.

Everyone have a safe and exciting 4th of July.

Very soon the registration forms will be ready for Do-It 2013. Look for them after the 4th of July. Let me know if you need one mailed to you.

Kathy



Let's give a round of applause to the caterers

From the Secure Vault of Ann Hill, Treasurer

Hello All,

Hope everyone has had a wonderful year. Thank you all for such a great turn out at our last Winter Blast. Looking forward to our 25th anniversary in Feb. 2014. Hope to see you all there again.

I have included our year end P&L that we will vote on in Feb 2014. Also a short edition as promised.

I do understand this last year was the longer P&L that we all use to fall asleep with at night, but it could not be changed until the start of our new year. Our new year which started on April 1, 2013 will feature the new shorter version. This version will be able to be read as you are waiting for the light to change at the intersection.

However, there will also be a longer version in waiting not only for the accountant but also for those late night readers.

Do It is coming in Sept. The 26th to the 29th. If you have never been, you should go. The people are great, hotels and walk across to the casino is fun. Machines pay, best chicken fried steak and gravy I've had in a long time. Walk a few blocks and there are many interesting free museums to visit. Then out to site, which is maybe a three minute drive to build fun things, visit with friends, and to top this off a wonderful afterglow at the end of a great day. Just like a camp out in the desert with wonderful pyro buddies but all the comforts of home within a few minutes to your hotel room.

Hope everyone has a wonderful and Safe 4th. Do lots of shows, or Attend as many as you can.

Enjoy the summer!!!

Ann Hill
WPA Treasurer

Winter Blast 24 walk-around

Winter Blast caters to many different interests. Here's a walk-round of some of the seminars, the "trade tent" and manufacturing.



The Round Shell workshop is always very popular with beginning makers. This year we had some advanced level shell workshops - a "Pattern Shell Workshop" (above) with Gary Hanson, and a "Pasteless Italian Shell Workshop" (below). Italian or cylinder shells generally need a lot of string spiking and pasting, which takes a couple of days. Randy and Aaron (AM Pyrotechnics) showed us how to do it quickly and easily, with little or no drying time. (I have other photos of this, but they show the faces of some members who shun publicity.)



One of the great traditions of olden times is the set piece, a fire picture made up of lancework. In the great displays of the early 20th century at Crystal Palace, London, these set pieces were sometimes sixty feet high and more that twice that width. Our efforts are more modest.



First the outline of the desired image is laid out on a trellis using thin wooden lathes, then colored gerbs are nailed to the outline to form the image of fire. Finally (not shown) all the gerbs are connected with piped quick match to ignite simultaneously at show time. Even a modest set piece can need thousands of gerbs and hundreds of feet of match, not to mention hundreds of hours of construction.



No seminar program would be complete without a rocket workshop or three. Here we have Ben Smith teaching how to make different kinds of rocket - BP, whistle and strobe - with one kind of tooling.



Other rocket seminars included "Introduction to Whistle Rockets", a Girandola workshop, and a hands-on "Black Powder Rockets for Beginners" workshop.

There were many other seminars - 25 in all - covering everything from display safety to manufacturing chlorate oxidizers. Nobody could get to all of them, and this has been just a taste.

Below - Ken Kosanke's "Hazard Management" seminar



The trade show tent was an opportunity to spend some money and put faces to some famous, and some not so famous, names. Regrettably I did not get a photo of everyone, so to those I left out, please accept my apologies. There was also a well-stocked 'C' product tent, which I have left out entirely,



Ken and Bonnie Kosanke, with their recently published "Encyclopedia of Pyrotechnics"

(Below) Eldon Hershberger with some of his Winter Blast video DVDs



Hunter Barrera, seen here holding a star plate and a rocket tool, now makes and sells all kinds of pyro tools. Two years ago, Hunter was one of our "Minors in Manufacturing".



Ben Smith of Firesmith Tools, with a large selection of his rocket press tools and star plates.



The manufacturing area was as crowded as ever, with many rocket scientists. Your editor made a few rockets this year, but must draw a veil of obscurity over their performance, or lack of it. Others have good reason for pride.



Nice little girandola

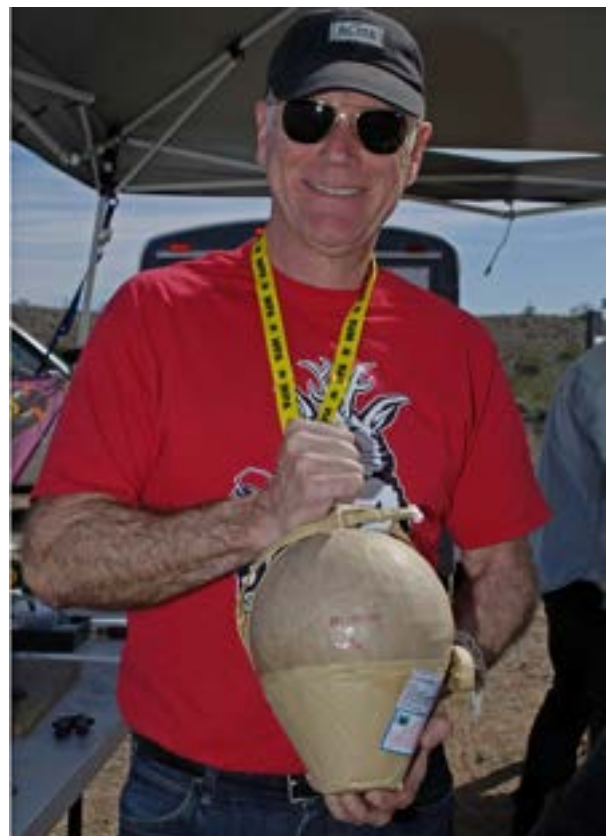
Very professional-looking rocket press



Of course there were shell makers as well. These shells are the little guys. The man-size shells were shunted off to "Area 51" where they could do no mischief. I'll get to them in a moment.



And as always, shooting commercial 'B' product is a popular recreation that most of us don't get much chance to enjoy. Here's Dave with a 6 inch, by the look of it.





BIG MAN, BIG SHELL

Ed Osdale holding his monster shell (below), and under construction (above and left) at “Area 51” on the far side of the park.



This looks interesting - a giant home-made cake of Class C shells and other consumer cakes. I watched this couple spend nearly an entire day loading and fusing their masterpiece, and after all that I forgot to speak to them and ask their names so I could credit them here.



Well, I could go on, but I'm out of pictures and it's time to let someone else have a chance.

PH

Cover Story

Winter Blast XXIV by Dave Ferguson

The preparation for Winter Blast XXIV started at DOIT, and we had a group conference December 1st. The group is Al Stahler, Andy Munios, and Dave Ferguson.



December 1st was not very pyro friendly; the wind was blowing above 40 mph most of the time. We were able to launch a few rockets during lulls in the wind. I have wind chimes that are about 5 feet long, and pretty loud, so we would build, and at the same time listen to the chimes. When the wind let up, we would load up and drive east of town into a valley and launch.

At one time we realized the rockets were going higher than the surrounding mountains. The people driving down the highway must have had a UFO experience.

We set up the new wolter pyro press, and found out that the NEPT tubes could not withstand the pressures, so we kept dialing back the pressure until they did not break. One of the major accomplishments was launching a multiple four motor rocket successfully.

The launch stand had to be steadied with heavy rocks because the wind kept blowing the test rocket over. Finally we were able to get it in the air.



Ignition!



Less than 1 second later

After the guys went home, a local and I put together an eight motor rocket. The eight motor rocket had three pounds of FFG in a V8 bottle on top. It flew pretty well.



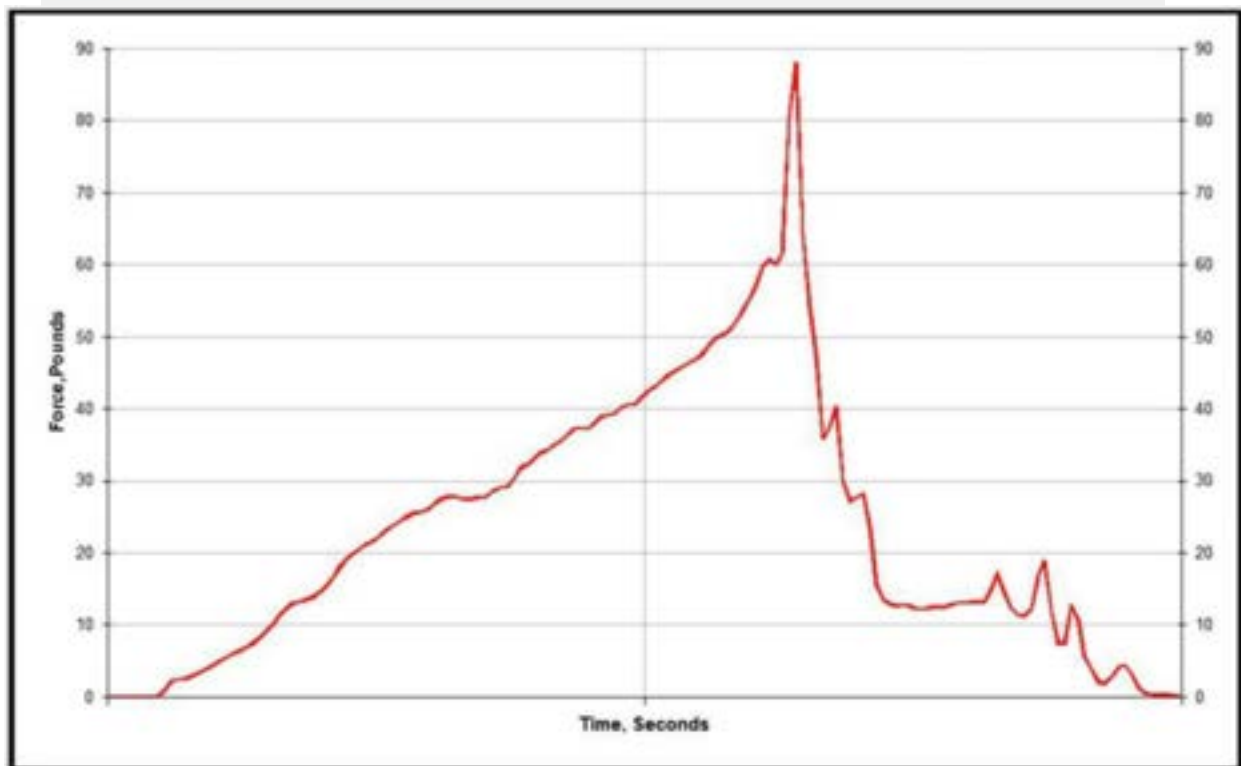
Next the press pressure was addressed, we cranked the PSI up to 8,500 built a sleeve to protect the tubes during manufacturing. This allowed the amount of fuel to go up an additional ounce, and made much better nozzles.

When we got to WinterBlast, we had 12 foot rocket sticks, 60 pounds of fuel, and many rocket tubes. Possibly we were a little overzealous because we only used about one half of the fuel.

I talked with Peter Hand at breakfast, he brought his rocket test station and volunteered to evaluate our motor. It was very interesting!

Run Number 33

**Peak Force 90.57 lb, Burn Time 1.75 seconds, Impulse 1469.91 lb.ft/sec
Fuel Consumed 16.41 ounces**



It appears that our ignition time is a bit slow. That needs attention. We were also able to scale the results to show our plans for this year's DOIT will not work as planned. I cannot tell you what it is, but be sure to attend DOIT to see the project, I promise you will not be disappointed. Oh, one more thing the pulled pork will be much better this year!

dv

Blinded by the Light by Dan Creagan

Each year in the week preceding Presidents Day, the Western Pyro Association hosts a big club meet in the desert near Lake Havasu City, Arizona. This year it was the 24th Annual Western Winter Blast (WWB) with the theme “Blinded by the Light”.

Several from the PGI are WPA members, and we often meet at WWB and make it our “relaxation event” for the year. We are all on our own dime - none of us are supported by the PGI to go - we just go because we love fireworks and we love the event. However, one or two of us were stopped and asked somewhat undiplomatically why we were there. Geesh... In any case, once we disposed of the bodies, we managed to have a great time lighting fuses and meeting many of our friends from the Western areas.

The event usually starts on a Thursday and goes for four days. Many of us come in the night before and meet for a “preglow” at a local venue. The “preglow” has taken on larger importance as the years have progressed and this time it was exceptional. We had a couple of hundred people wandering in and out and, for \$15, we had lots of root beer (?) From Mudsharks - a local microbrewery that is the biggest WWB sponsor - and pizza. Kief Adler gets the credit for organizing this each year.

It is not just a club shoot - it is also an opportunity to have public displays and get support of the local community. This year, Pyrotecnico, Wolverine and J&M put on professional displays that were well received by the town and by the WPA members. In addition, there were member featured pyrotechnics, and a great tribute to deceased members that put a tear in many eyes. They did it right. There were seminars, trade show vending, class C sales and even a Display Operator’s Course taught by PGI trainer Deb Ludwig.

Bright and early Wednesday we pumped up on orange juice and coffee and went into the desert (actually Sara Park, which is a very hospitable place) to start making pyro and meeting and greeting friends. By the time Sunday night had ended we were sleep deprived, dehydrated, sunburned, and had permanent smiles on our faces.



Bare camping area was packed!



'B' Rocket Line



'B' Line (shells)



Here is an impromptu girandola seminar with PGI and WPA members. You may recognize Carol Hostetter, Uncle Buck's head, Jim Biersach and Kurt Medlin. Note also the layout of the open area manufacturing. Bill Ryan - manufacturing chair for WWB - did a great job of setting things up.



The Jackalopes had an open shoot area where they set up lots of wired targets, such as the Jackalope pictured here, and attendees happily blasted away with consumer shells and roman candles. Giggling was rampant.

Of course there were fireworks too! This shot was from the Pyrotecnico program..

All pictures in this article were by Tom Handel - Thanks Tom. Also, once we start giving thanks, it becomes hard to make sure everyone is included. The Board of Directors, staff, and volunteers who made WWB24 happen deserve a special round of applause. Nice job, guys! Heck ... nice job to all the members of WPA - you made me a little kid for four days.

Want to have some fun? Think about showing up in the desert for Western Winter Blast next year. You can read all about it and get all the information on the WPA website at www.westernpyro.org

(This article originally appeared in the PGI bulletin. Used by permission.)



Bay Area Maker Faire

WPA was represented with a booth at the Bay Area Maker Faire in May this year. The Maker Faire is an annual event, sponsored by Make Magazine, that attracts people who like to roll their sleeves up and *make things*. All sorts of things. - robots, art projects, electronics and so forth. The prime mover was WPA member Dave X, with help from Dave Best, Marty Walker, Wally Glen and many others.

The level of interest was so great that the stand ran out of promotional materials before the show even opened. Mike Garret reports:



I helped at the WPA booth for most of Sunday. The interested and enthusiastic traffic volume was truly amazing! We had 3 to 6 WPA members available in the booth all day and I think most of us had less than 30 minutes of down time to guzzle some water, sneak a quick bite of food, and to pee. We were all hoarse from talking to the continuous stream of people.

The reactions and questions were varied but common themes went something like Chris' comment above or "Can you really do that ... legally? Really? Wow, tell me more!"

I was struck by how curious people

were and how quickly they grasped the basic concepts of shells and rockets. There were a couple of knuckleheads in the crowd but more than 95% of the people were reasonable pyro candidates. I personally talked to 6 or 8 people who got that gleam in their eye suggesting they had found something significant and possibly life changing in a good way. The Maker Faire is a self selecting crowd of people who are naturally curious about things and want to get their hands into the mix. It might be a near perfect hunting ground for finding new pyros. My question is why didn't we think of this earlier?



Booth design by Dave Best
Pictures by Marty Walker and Dave X
Demo shells by Dave X and Wally Glen
Tools supplied by Mike Garrett

(The Editor would like to hear from you, if you joined the WPA as a result of visiting our stand at the Faire)

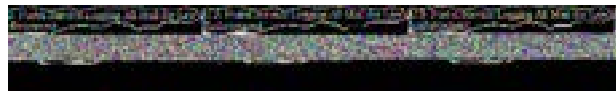




“They hate us for our freedom”



None of us ever expected that “they” would be our own government.



NSA collected US email records in bulk for more than two years under Obama

- Secret program launched by Bush continued 'until 2011'
- Fisa court renewed collection order every 90 days
- Current NSA programs still mine US internet metadata

We're very privileged in the United States that we still have the freedom to practice our art. There are plenty of people who would like to take that freedom away from us. Don't give them any excuse.

Stay legal, and stay safe.

The Firework Factories of India

By Peter Schoewe

This four part article covers the 12+ Firework and Chemical factories
I toured in Sivakasi, Southern India.

Part Three

AJA Sulfur Pulverizing Plant, A Magnalium Crushing plant,
And The Sri Kaliswari and Cornation Firework Factories.

AJA Chemicals

The AJA sulfur pulverizing plant is twenty minutes east of the Barium Nitrate plant in Sivakasi. Sitting on about two hectares (2.47 acres per hectare,) that is covered with dry grass and trees. This sulfur plant will pulverize 700 MT (metric tons) a year, it was built five months earlier. There is no Sulfur or Magnesium mined in India so the owner of AJA Chemicals buys his sulfur from Jordan. He could buy it from Russia, but it would costs more.

Several tons of sulfur laid in one corner on the cement floor. From there the sulfur was shoveled into the pulverizer. The pulverizer was engineered and patented by Raja of SME Chemicals who is also in Sivakasi.

The pulverizer operates by a spinning metal wheel inside the unit that breaks apart the sulfur into dust. The sulfur then passes through a metal plate with many holes in, 200 or 325 mesh sizes. From the pulverizer the sulfur is blown into a hopper which drops it into fifty Kilo bags.



AJA Chemicals



Soft Chemical Pulverizer

Raja of SME Chemicals sells these pulverizers throughout India and has helped the owner of AJA Chemicals get into this business.

An employee of AJA Chemicals lives in his own one room grass hut he built near the work building.

Locals can buy sulfur for around 0.37 U.S. cents a pound.



Sulfur



Employee Housing

After lunch we toured the Sri Ramesh company makers of Robin brand match sparklers. They were at the west edge of town.

Robin Match Sparklers

This property was about one hectare in size. After walking through the office we came to a small courtyard with doors on each side leading into work rooms. Some rooms were for storing the finished product, others for different stages of manufacturing or boxing.

In one room a woman put many rows of wood sticks, the size of the sparklers into a wood rack then temporarily bolted them together. These racks would get taken outside where they would get dipped into sparkler comp and left to dry in the sun. The match sparkler has a strike head on it like a match and would get struck on the side of the box to light. Seven different sizes are made, from four to 50cm long.

Regular sparklers were made at another factory across the street which was twice the size, with many more buildings, having fifty employees in all. Inside photography was not allowed.



By the way I was told match crackers are against the law to make as in China, but I've seen some from both India and China.

We skipped seeing a Potassium Perchlorate factory. That owner didn't want to discuss anything nor give a tour, because he was six months back logged with orders.

Magnalium Pulverizing

A Magnalium pulverizing plant was twenty minutes out of Sivakasi. The property was on a small lot next door to other small industrial buildings. We walked past a desk inside the front door and down the hall. To the left were three small rooms that stored their finished product.

They crushed and ground 100MT of mostly Magnalium and some Magnesium per year. They get most of their mag. from China in custom ordered ingots, sized to fit their machines. Some Mag they get locally sold as scrap.

The last small room on the left had a sanding disk that ground down 50cm flat bars of mag. The bar was clamped in place by metal mounts and a spring pushed the bar into a rotating cylinder covered with what looked like 20 grit sand paper. This took the mag. down to 200 mesh.

In the main room were six machines with five men and lots of mag dust floating in the air that covered our clothes. There was a lathe for making curls of mag. which would get reduced further at the fireworks factory. A cutting bar was weaved back and forth by hand to shave off the curls.

There were three roller crushers in two different sizes. Large chunks of mag. were dropped in by the pan-fulls. The smooth rollers could move apart in case some pieces didn't crush fast enough.

The crushed magnalium dropped into a tray and slid down to a bucket. The operator picked up the bucket and dumped it back in the same crusher to reduce the mag. smaller. He did this three times with each batch, then moved it to a smaller crusher to reduce it to 20-60 mesh. A vibrating screen helped separate the sizes.

Some men wore goggles and a cloth over their faces, but they needed a heavy fan to blow the dust out the windows.



Grinding Magnalium



Making Magnalium shavings

From here some magnalium was coated with Potassium Dichromate. (An orange and poisonous chemical.) The Dichromate was added to hot water in a five gallon steel bucket. It was stirred to mix; then the powdered magnesium was added and stirred.

Plastic tarps were indoors and out for drying the Dichromate covered mag. The mag. was piled on the tarps 2cm thick. Every so often a worker walked out and shoveled the fine particles around to expose a new surface to dry.



Roller Crusher



Magnalium

No one in India is allowed to make or own five micron magnalium or Aluminum without a special license. In this case they could only sell it to the military or for export.

Offset Printing

From the Magnesium shop we stopped by an offset printing company where fireworks labels were printed.

After Germany, Sivakasi has the second largest number of German offset printing machines in the world.

This place was nicely air-conditioned at sixty-five degrees Fahrenheit. Nine men worked here. Among other jobs about 10% of their work was producing labels for fireworks. The shop had a heavy smell of ink, but not as bad as the printing places in China.

This press had a four color printer. Each roller section added a different color. They ran one sheet of paper though, then four men looked at it, while some used a large magnifying glass. If they saw any mistakes they would tell the operator to make an adjustment and then run another test sheet. They did this many time over.



Four Color Printer



Casino Balls Cake Labels



Nayagi Fireworks Store

The Nayagi Fireworks store was down an alley off the main street. I was not allowed to take pictures inside. This store was the cleanest place in town. Three well dressed men walked around with their hands behind their backs. The floor was polished marble. Clean glass shelves were filled with sample products, with a warehouse in back filled with boxes of fireworks. Firework stores may not be any larger than three meters square. Since this was considered a show room, the stores floor space was allowed to be much larger.

Explosion at Sri Krishna Fireworks Factory

The next day in the English version of the Hindi Times featured a story about an explosion at the Sri Krishna fireworks factory. It had happened the previous day. The company name sounded familiar. The time of the explosion was about 11:00am, which was the same time I was at the Sri Krishna chemical plant. The owner had received calls right away about the explosion, but I was not told about any problem, so I knew nothing about it until I saw it in the paper. A dramatic photo showed bricks and cement scattered with firemen walking around the rubble. At least twenty-five out of sixty-five small cement buildings were flattened. Another seven with severe damage. Eight people died right away, nine more were expected to die within the week from severe burns and forty-five more were injured. At least 200 people worked at that factory. It took three hours to put out the flames. It didn't say how the explosion happened, but I found out through other factory owners. An employee carried a steel bowl of black powder into his cement work building when it slipped out of his hand. A spark was made when the bowl hit the cement steps. Unlike in China where chemicals are washed off with water from the cement floors with a garden hose at least twice a day, in India, any chemical dust is swept up using only a very inefficient broom made of small twigs. This type of broom is commonly found in stores there and I saw it used at all factories I toured.

The spark had ignited loose powder on the steps, which ignited the powder that fell out of the bowl then spread and ignited rockets in the building. These rockets flew out and landed on drying platforms igniting more rockets which flew into other manufacturing buildings and the chemical supply room. The doors to the chemical supply and other buildings, by law have to remain open during manufacturing.



What was a Sri Kristna Factory

A week earlier when I was in Mumbai there had been another explosion at an illegal fireworks factory two hours south. One factory owner said. "You know it was illegal because the explosion happened at 7pm. It's against the law to work past five pm at fireworks factories."

Sri Kaliswari Fireworks Company

At 9am the next day Mr. A.P. Salvarajan showed up with a driver. He is the head director and one of fourteen people from two families who own the company. Only one person a year tours his factories, I assume from India with little to no foreigners. At least 150 people work at the two story office. Two to three men sit at each small wood desk across from one another receiving firework orders from through out India.

The company has been around since 1923. 2,300 men and 4,800 women work for Sri Kaliswari at over twenty factories. Sri Kaliswari also produces matches, has a printing shop or two and owns one of the two Aluminum atomizing plants nearby. The “Standard Fireworks Company” has the same number of employees.

Mr. Salvarajan, like other factory managers and owners subscribes to the American Fireworks business news. He’s read that America’s fireworks sales have gone down 10% because of the economy and now the Chinese market is saturated with consumer fireworks.

Fountains, rockets and firecrackers were made at the first factory we stopped at. The place looked about twenty hectares (50acres) with at least ninety small manufacturing sheds.

Inside the factory I was greeted with a charming impromptu welcome sign made out of colored sand on the ground. It took three women forty-five minutes to make. I asked Mr. Salvarajan to thank the women for the Welcome sign.



He told me anything for export always needs visco, even on firecrackers, it's what their government demands.

No less than six managers followed us around. They kept walking back and forth in front of my camera while they picked up fireworks and showed them to me.

We drove to another place. This was at the edge of town with houses across the street. It was on one hectare with four, two-story buildings.

In one room sulfur was pulverized in another was a machine that made plastic parts such as fountain stands and rocket nose cones. Other rooms made paper tubes.

Upstairs were about fifteen tube rollers operated mostly by women who rolled the paper into mortar tubes. Some machines cut the papers to size, and others rolled it up with the assistance of a worker. The paper was on a three meter long narrow table. A woman wrapped each sheet of paper around a metal tube and then with the help of a motor spun it around, sealing with glue at one end. In a few seconds the tube was done.



Hardening Paper for Cone Fountains



Making Mortar Tubes

We stopped at a sparkler factory with over 100 employees in at least fifty buildings. Many racks of sparklers were outside drying in the sun. Then we visited a plant that, cut, folded and labeled boxes for their products. This too was in a residential area. Inside a large building were all the machines to make boxes including a four color printer. In another room women sat on the cement floor while operating at least ten screw presses that made circular disks for ground spinners.

Outside, triangle shaped papers were dipped by hand into a solution for making cone fountains. This gave them strength for hammering in the comp and also fire resistance. A hollowed out log was used to hold the solution.

Another factory made firecrackers in sizes of 180 milligrams, 1.5 grams, two grams and 2.5 grams, nothing larger.

We dropped Mr. Salvarajan off at his office while three men and I continued to another magnalium plant thirty kilometers east.



Empty Firecracker Tubes



Melting Magnesium Engines

Another Magnalium Pulverizing Plant

This plant pulverized 70MT of magnalium a year. The company was building three more small buildings to expand. 80% of their magnalium and magnesium came from China. 20% came locally from engine blocks and scrap aircraft parts, which the owner told me was Ferro Magnesium, 40% steel and the rest magnesium.

The Engine blocks were melted in a cone shaped pot. A young man stood mixing the magnesium where charcoal and a fan were used to heat up the pot. Even though windows and doors were open, two meters away from the fire it felt like 150 degrees Fahrenheit.

In another room a worker let these cone shaped ingots fall out of his hands onto the cement floor to break them apart and then broke them up further with a 5lb hammer.

The casted ingots from China were not broken, but instead ground by a sander or put on a lathe. As in the other plant the curls from the lathe were shipped in burlap bags to the fireworks factory where they were reduced down to forty mesh.

At 7pm back at Mr. Salvarajan's office, twenty-two factory managers stood in line to show their production papers for that day.

Around 9pm I was picked up at the Bell hotel. Twelve of us, ages twenty-five to fifty-five, ended up at one of the factories for a fireworks demo. A strong wooden table was set up for one of the owner's sons and myself to sit around with two plastic chairs, a table cloth and soda.

Three carts full of consumer cakes stood nearby 20-30 in all.

The demo lasted at least forty-five minutes. The shells from the cakes had many good and interesting colors with good height and spread. The men standing behind me commented on a halo around the star bursts on my video monitor. I hadn't seen this before.



Chemical Prices

Later that night Raja had arrived at my hotel with a price list for chemicals. 325 mesh of Antimony tri-sulfide, for example was \$18,000 per MT (a metric tone is 2,210lbs or \$5.43lb for this antimony). If the chemicals are in large tyvek bags then a twenty foot shipping container could hold up to twenty-two MT. If the chemicals are in steel drums, then up to 18MT can be transported.

It's not allowed to export sulfur out of India unless you have a letter from your government giving you permission to import it into your country. But then it isn't mined in India either.

Raja asked me what restrictions we have on sulfur in the U.S.. I told him we can buy it at some hardware and nursery stores. He said ten years ago he and a friend went to Sri Lanka to see if they could sell chemicals. In Sri Lanka they made all their own fireworks, because the government of Sri Lanka doesn't allow import. There were no labels, just brown paper. They made fireworks in their houses, backyards and almost anywhere.

A day earlier Mr. Paneer of Sri Kaliswari said there would be a full eclipse from 6:30-8:30am the next morning. All temples would be closed. Good! At least I wouldn't have to hear that bell ringing next door at 5:30am! Many in India believe you shouldn't do anything, but stay indoors during an eclipse.

At 6:20am Wednesday morning I got up to photo the eclipse from my 5th floor bathroom window. (It was the only room on that top floor.) I saw only a small part of it. I went back to get my camera and never saw it again. When the local paper arrived, it said the eclipse had started at 4:30am and ended by 6:30am. I saw a photo of it in the paper.

Cornation Fireworks

Because of boulder sized pot holes in the road we drove ten MPH to one of Cornation Fireworks factories, it took us forty-five minutes.

Cornation has six factories with up to 1,000 employees, with 480 buildings in all.

Inside one of the factories there was a cardboard box a meter high by 50cm square that sat on a drying platform. It was full of five-gram box salutes made of aluminum, potassium nitrate and sulfur

To make charcoal snakes, comp was poured into eight small steel cups which sat at the bottom of the press. The worker turned a handle, steel rods came down, and the chemicals were compressed into small snake pellets. As he continued turning, a steel arm came out from behind and slid the pellets off the plate into a small chute that guided them into a steel bucket on the floor. The older salesman told me they were installing motors in the back to automat the process.

They made two sizes of snakes here as well as ones called Silver snakes in the shape of stars. In another small building five women sat on the floor putting snakes into boxes with a piece of cotton. Other snakes were put into plastic bags without a box. The salesman told me “Appearance of the box (art deco) is very important in India.”



Factory Entrance

In another building they made Inserts for cakes. Clay was hammered into one end of a small tube with a hole for a fuse. Then black powder was hammered into the fuse hole. The bottom of the fuse hole was concaved so a larger amount of black powder was exposed to the lift. Small round stars half a centimeter across were dropped in, then sand then packed in with clay.

My guide said the law allows a maximum of four grams of lift for any size consumer shell. Cakes and single shot mortars may have shells as large as 3.5" and contain up to six grams for burst.

There was no burst charge for these inserts. I've also noticed this with some shells made in China. There's only the black powder coating around the stars.

The ingredients and percentages are on each box as required by law. One box of salutes said six grams, but my guide told me it's no more than five the maximum allowed. The cracker sizes made by Cornation were 250mg, and one, two, four, and five grams. All these have the shape of a regular firecracker with a fuse coming out the end. Four and five gram crackers were also in the shape of balls made with a small cardboard box with green string around the outside.



Catalogue



Five Gram Salutes

Across the street in an empty field we watched two employees light off crackers and fountains. The salutes had a muffled sound to them, even with a lot of string wrapped around them. Was it the 57% Potassium nitrate, 23% 325 mesh Aluminum and 20% sulfur or because we were in an open field so the sound had nothing to bounce off of?

Green salutes consisted 32% Aluminum, 25% Barium Nitrate, 23% potassium nitrate and 20% sulfur. Lift for shells was of 55% potassium nitrate, 38% charcoal, 6% sulfur and 1% C₆H₁₀O₅, (Cellulose). Green aerial bursts were 61% Barium Nitrate, 21% Magnesium, 10% C₂H₃Cl and 8% sulfur. (Researching on line I couldn't find what this C₂H₃Cl was.)

His men lit off fountains under a tree to see them better in the shade. The cone fountains had great sparks but only lasted two seconds.

After three fountains, the dry grass caught on fire. One man threw sand on it with his hands and put it out. He couldn't stomp on it since he had on sandals and a sarong above his knees.

100 people were cleaning the large rain ditches of weeds and paper junk. They were paid 100Rs a day for a month, every year by the state getting the ditches ready for the rainy season.



A Box Strapping Machine



Factory Store, Artillery Shells

On the drive back to town many women walked along the country road barefoot on the hot ashfault in the heat, with buckets of water on top their heads, others had large baskets of food or clothes they had washed in a nearby less than clean river.

I asked if we could see the factory that blew up. The company salesman called someone then said. "No. Especially that you are a foreign national."

At the office I met the founder. The office was 12m long. Cornation is run by two brothers. It was started by their father in 1973. He was the first firework factory owner there to find a way to make the color green without potassium Perchlorate. Some manufacturers didn't find it worth while going through the trouble of getting the license to use Potassium Perchlorate, so they used PVC. Cornation made extra money in that first year since many customers bought from them until the other companies caught on how to make green with out Potassium Perchlorate.

We drove to a Cornation fireworks store. 2Rs 0.04 cents U.S. for a pack of 28 firecrackers. 150Rs. (\$3.00) for 10 ground bombs of one gram each and \$3.00 for a single shot five gram aerial salute. I thought that was a lot of money. He showed me a twenty-five shot cake with $\frac{3}{4}$ tubes and said "the se and others are manufactured with Potassium Chlorate." I don't know if he meant Perchlorate.

From my hotel I was picked up by Ravi's office worker in his late teens. He played Hindi rock music from the radio as we drove in an SUV.

We stopped to walk around town, visiting a few more fireworks stores and pastry shops with 100s of flies on the pastries behind glass.

My guide seemed to have known many of the shop keepers. And there was nothing grocery about the grocery store. It was filled mostly with plastic one-dollar products from China, and little food.

Outside we saw six monkeys on the roof tops, walking from one building to the next. One hung upside down on the power line to cross the street. The monkey stopped on the awning of a small convenience shop and reached down to grab some potato chips. The owner tried to take the chips off. The monkey would hiss and show his teeth. The store owner scared him away with a stick so he got no chips. I guess that's why some call this the Urban Jungle.



No Charge for Dinner

Later in the evening I drove around town on the back of a motorcycle. After eating at a small pasta shop the owner told me I didn't owe him anything.

In temples you were required to take off your shoes, even though the floors were not so clean. Photography was not allowed. At one temple there was a two headed, 2m tall, black marble Cobra. White stone elephants also stood 2m high.



On the ceiling were paintings of women of either green, blue or yellow with six arms, riding large fish, lions and dragons as well as other mythological creatures.

In our last section, we will visit the Asok Sparkler Factories, the Arasan Aluminum atomizing plant and fireworks factory, and the small, but colorful Fireworks Market of New Delhi.

AJA Chemicals has no website

www.Kaliswari-Fireworks.com

www.CornationFireworks.com

On the following two pages is our WPA publicity brochure. If you are able to print these two pages double-sided, they can be Z-folded into a hand-out.

DO IT is our second annual event. It is presently held in Hawthorne, Nevada, in late September.

DO IT is primarily an event for those who like to build their own fireworks. Class B and C product is sold for shooting at the event, but most of the fire in the sky is made on site by the members.

DO IT is an opportunity to move forward with the craft - make that big shell you always wanted to try, experiment with rockets and mines, build a dozen or two smaller shells or a couple of special ones for the member's showcase display.

DO IT is affordable, with an inexpensive motel and diner less than a mile from the site where they're pleased to have us and really know how to make us welcome.

DO IT has long manufacturing hours, so you can get the most out of the time. With helpful and experienced members around to share advice (or a WASP shell pasteurizer), DO IT is the premier maker event of the Southwest.

DO IT

WPA



Western Pyrotechnic
Association

Where and what we do

WINTER BLAST

Western Pyrotechnic Association is a club that brings together amateur and professional pyrotechnists and people who just love fireworks. Our premier event, Winter Blast, is held in Lake Havasu City, Arizona, every February in the week leading up to President's Day weekend.

Over the course of four days, learn from the pros at teaching seminars led by some of the most accomplished pyrotechnists in the USA. Develop your knowledge to make rockets, shells and set pieces in practical hands-on sessions under the guidance of experienced instructors.

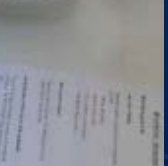
If you already know how it's done, set up a table in the manufacturing area and have at it along with our other experienced members.

Have a blast shooting fireworks at the event. Fireworks of all kinds can be pre-ordered, and Class C consumer fireworks are on sale from several vendors at deep discount. Other vendors can supply the chemicals you need to make your own devices.

There are professional shows every night, including showcase items the like of which you never get to see at public displays. Thousands of local people drive out every night to watch these shows.

There isn't enough space to tell you everything that goes on - the clever and the crazy, monster shells, anvil shooting, afterglow socials that run late into the night.

You just have to BE THERE.



COME AND JOIN US!

Membership of the WPA offers you many unique benefits -

- Purchase and shoot large professional fireworks not available to the public;
- Make and shoot your own fireworks, with expert help and instruction on hand;
- Learn from the experts who share their knowledge on techniques and chemistry;
- Enjoy the best professional showcase displays you will ever see;
- Eat, drink and be merry with a friendly bunch of people who share your interests.

These things are only possible when we do things together. Only a large group has the resources to put on events like these.

Membership is open to anyone 18 years of age or over. For details on how to join, please visit our web site

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