



July 2012, Vol 23-1

# Western Pyrotechnic Association Newsletter



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To receive a catalog or request information,  
please call or email. Ask for Jim or Becky on  
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# WPA Newsletter, Volume 23, Issue 1

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oops...

## **Elected Officers of the WPA**

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

Cover Picture: "Colored Stars" by Frankie Hand

## IMPORTANT NOTICE

The Western Pyrotechnic Association, Inc., also known as the WPA, is a non-profit group of fireworks professionals and their apprentices. This newsletter is a vehicle for their exchange of information in this craft and the right to publish this information is guaranteed by the Constitution of the United States of America. Nonetheless, readers are urged to learn and obey all laws and regulations of all federal, state, and local jurisdictions and of their agencies and representatives. Some information herein may contain incomplete descriptions of fireworks techniques based on the experience of its author(s) in a controlled environment with circumstances, and conditions different from the reader. Readers must form their own opinion as to the application of this information. This information is considered documentary in nature and no opinion is given as to its suitability or use. No warranties are made either expressed or implied, including but not limited to warranties of the accuracy of the information herein. The WPA is not responsible for the opinions of authors or mistakes in printing. All information is intended solely for viewing by members of the Western Pyrotechnic Association, Inc. and its associates. The WPA's entire liability and anyone else's remedy shall be a refund of the subscription price. In no event shall the WPA, or its officers, or the editor, be held liable for any damages whatsoever arising out of use or inability to use the information in this publication, even if said parties have been advised of the possibility of such damages. This publication is published by and is the sole property of the copyright owner, and is not to be sold or reproduced in whole or in part without written consent of the editor and publisher. The contents of this newsletter are Copyright 2012. All Rights Reserved by the Western Pyrotechnic Association, Inc., or the author(s), if so indicated, and is re-published by permission of the copyright owner. Any previous agreement to allow any one to re-publish any material from the WPA, Inc. Newsletter is revoked and void as of March 1, 1995. Reproduction without permission will be deemed a purchase and implied authorization by the user to accept billing and make payment of a minimum \$50 user's fee per instance of use. Distribution is limited to paid subscribers. Submission of written material, graphics, and photographs dealing with pyrotechnics or fireworks, related technologies or activities of, and information to the benefit of the members of the WPA, Inc. are gladly solicited. All submissions become the property of the Western Pyrotechnic Association, Inc., and may be edited or rejected for any reason. No payment is made for submissions and submitted materials cannot be returned.



# From the Desk of the President

Time keeps moving, four months has passed since WWB23, and while the event has passed, the memories of this fun event remain. The fun, the friendship and fireworks couldn't have been better and the weather was great. I want to take this opportunity to extend my thanks to all who participated. Without your involvement, participation and support, none of this would be possible. Our member volunteers, WWB Staff, vendors, display companies, the Lake Havasu Cert Team members, and the general public made this possible and I thank you all for stepping up in a poor economic time, to show your support and help keep this event alive. I would like to personally thank our WWB23 event staff, and my co-chair, Richard Haase for his work on this years event and for heading up the shell-building seminar. I would also like to thank Steve Wilson, for having such a great seminar line up and the wide diversity of seminars this year, including the ongoing PGI shooter certification course taught by our past Treasurer Debbie Ludwig with the help of Micki and Steve McDanal from Aurora, Co., we hope to continue to provide this ongoing certification process for a better understanding of the safe and legal shooting aspects in pyrotechnic displays. All went so incredibly well and Aaron Mayfield, from A.M. Pyrotechnics did a pubic display to make us proud. The public loved it, and so did I. Great job and kudos to Aaron and crew! A big thanks to Blue Parish for putting together the Members Showcase, and to all of the demo providers, the Jackalopes, the anvil guys (what a kick!), the fire-cracker wall etc., I thank you and thoroughly enjoyed your efforts and presentations.

We held elections for the office of President, Treasurer and VP of Publications at the General Business meeting on Sunday morning at the Aquatic Center, and I'm honored to say that I was elected to serve as your President, Ann took on the office as our Treasurer and Peter Hand was elected VP of Publications. I thank all who donate their time and efforts to see that the club continues on. Pete gets well deserved thanks from me and the new board of directors. Tom Calderwood held The Office of Publications VP and Treasurer Debra Ludwick went out as well, I can guarantee they have served the club over and above, we thank you.

DO IT 2012 in Hawthorne, is the clubs next event, here's what I have so far. Joe Wright is your event Chairman. Daniel Dutra is the co-Chair, the dates are confirmed for

September 20, 21, 22, 23, of 2012. The 23rd is clean up. The host hotel will once again be the El Capitan. I suggest you act quickly to reserve your rooms. We have a 75 room block as of right now, and if more are needed, they will try and accommodate us. (IMPORTANT! IF YOU WANT A MICROWAVE in your room, be sure to ask for this when making your reservation.) If you stay 3 nights or less - you pay \$42.95 plus tax per night. If you stay 4 nights - you pay \$32.95 plus tax per night. If you stay 5 nights you pay \$29.95 plus tax per night.

The number for reservations at the El Capitan is 1-800-922-2311.

For you folks who plan on bringing your RV's it's the Whiskey Flats RV Park you want. They have 60 pull through spaces, full hookup rate \$25.00 + tax per night, weekly full hookup rate \$152.90 + tax.

3045 Hwy 95 Hawthorne, NV 1-775-945-1800 or [www.whiskeyflats.net](http://www.whiskeyflats.net)

Peter Hand will be doing the News Letter, we have the talent and the members who can turn a relatively low input newsletter into one full of new, old and interesting information, whether you are a long time member or a new one, we want (and need) to hear from you. It's our club and our newsletter, but it needs our input to make it happen. For more info on this, contact Peter Hand, at [pete@westernpyro.org](mailto:pete@westernpyro.org) and I'm sure he'll appreciate it.

In closing, I will ask that anyone that might have ambitions towards being more involved in Club politics or being more involved in the setup and execution of club events please let myself or any BOD, Event Chairperson or Staff member know of your desire. It would certainly be advantageous to have people being trained to eventually take on any of the many positions that are necessary for this club and it's events to continue.

Again, my sincere thanks to all involved in our club, and thanks for allowing me the privilege and the honor of presiding over this great club.

Lynden King  
WPA President

## From the Veep!!

Another Winter Blast has come and gone. We have a new Board and I look forward to us working together to make the WPA the best Pyro organization around. I would like to thank Pete Wood, Tom Calderwood and Debbie Ludwig for their service to the WPA. AM Pyro delivered a fine public display and we had great demos, too. As usual, the staff worked tirelessly to make this a successful event. Thank you to all those who volunteered some (or a lot) of their time to make Winter Blast the event that it is. We also had a fine seminar schedule that afforded everyone the opportunity to share and gain Knowledge.

"Every production of genius must be the production of enthusiasm."

Reading this fortune I pulled from my cookie (disregarding the fact I was in a Mexican restaurant at the time), I had an epiphany that this applies to our membership efforts. Just a few facts from the census.gov website. The population of Los Angeles County, CA (LA, natch), is 9.8 million, while Maricopa County's (Phoenix) is 3.8 million, and Clark County's (Las Vegas) is 1.9 million. That means 15.5 MILLION people live within 5 hours of Lake Havasu City, where WWB is held. The board is looking at different ways to recruit quality members. There is no reason we cannot have a core membership between 1200 to 1700 people with approximately half (or better) attending WWB every other year. This just includes the three major metropolitan areas I mentioned. We have quite a few members from the rest of the US and the world. All membership drive efforts involve not just the Board, but also the membership. The fastest way to double our numbers is to have everyone recruit one new member. Think of all the people you know, the folks on your pyro crew, even your relatives. I know we have several members who bring their parents just to hang out and watch the shows.

I look forward to hearing from y'all with ideas and please don't get mad if we don't use yours (no free Cadillac with paid membership). Be careful on the Fourth (remember, safety third) and have fun. See everyone at Do-It!!

Greg Dandurand  
WPA Vice President

## Secretary Notes

Well - As the WPA secretary I suck for the months of March, April and May -But I'm great the rest of the year. If any of you who have all months of the year to dedicate, please step forward next February.

As a teacher, I am over worked the last few months of the school years (planning my summer break) but have renewed energy in time for Do-It and the next Winter Blast before I burn out again. (refueling with great pyro during the 4th of July spectaculars). I look forward to another great year of fun !

Share the fun with those you know! Membership needs to grow!

Kathy Bauer  
WPA Secretary

## From the Desk of the Treasurer

Hello Everyone,

With another Great Winter Blast under our belt, and the anticipation of Pyro Playa and Do It on the horizon, it is with great pleasure to be back after three years off as your Treasurer. I enjoyed my Five Years of service to you and the club and looking forward to many future years ahead.

We now must turn our attention to Pyro Playa and Do It. So start saving those cans, get a newspaper route or what ever it takes to be able to get to these Events.

Also, you ask I have many friends who want to become members, or those you don't know yet. Now is the time to get these people signed up as New WPA Members. Membership is something we all need to do something about.

Looking forward to a Great Year.

Ann Hill  
WPA Treasurer

## Publications

Well, here it is at last, the long-awaited first 2012 Newsletter, and my first as VP of publications. I hope the lengthy wait was worth it, and I'll do my best to make sure you won't have to wait so long for subsequent issues.

Tom Calderwood is a hard act to follow, and I am acutely aware that my work is not up to the same standard yet and lacks flash and style, but I hope you'll bear with me as I climb the learning curve with this new-fangled Desk Top Publishing software thingie. Photography is not a major activity for me, so I am more dependent than Tom was on member submitted material. If you have some nice photos you'd like to share with the membership, feel free to send them to me and I'll fit them in (with proper attribution) wherever I can.

There will be two editions of the Newsletter in future. One will be published as normal in a section of the web site that requires a member login. The other will be made freely available in a public section of the web site that does not require a login. The difference between these two editions is that the public version will not contain the "business section", items such as meeting minutes and accounts intended for members only.

Pete Hand

## Farewell from your Ex-President

(Pete Wood)

As you might already be aware of, I am no longer the President of the WPA.

Your new President ( Lynden King ) now takes the reins of the club, and his past experience and dedication to the club can not be disputed. I'm confident that Lynden will do a fine job and keep things moving in the next two years for the good of the members and the WPA. I sincerely wish the best for the new members that have recently joined the BOD's and for those that still remain. Much is at hand and I expect they will be busy addressing new and old issues to adapt to their visions and hopes.

After looking back over 4 years of service as your past President, I can say with confidence that it was a great trip! Much was accomplished and much was learned on the way. I leave feeling accomplished in some areas and disappointed in others. There is no "perfect world" – it's only what you put in to it that can ever come back – good or perhaps not so good. Nothing ventured – nothing gained.

I was honored to have the BOD's grant me a lifetime membership based on my efforts over the years, and while I was virtually speechless at the business meeting in regard to the award, I can't tell you how honored I was to have been considered for such a prestigious award. Thank you all for bestowing this upon me.

In closing, just let me say that open minds create new possibilities. In our current political climate from the agencies that regulate and watch our moves, to the economy, personal apprehensions regarding club policies etc, don't let your fears and gossip rule your decisions in whether you keep on as a WPA member or not. Use YOUR best judgment as to how you want to see the club progress and then **SPEAK YOUR MIND** by attending the next business meeting, in order to have your voice heard. If you don't attend or choose to say nothing during the meeting, you have only yourselves to blame. **This is how Democracy works – USE IT!**

I'll still be involved and you all won't be that lucky to never see or hear from me again.

Thank you all for the honor of serving the WPA as your President for the past 4 years.

Fireworks are a freedom – but only if you're willing to fight the fight for them. Otherwise they will just be a memory in years to come.

Sincerely,

Pete Wood

# WPA CORPORATE MEMBERS

## **Combined Specialities**

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## **Pyro Spectaculars**

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## **Friends of the Fair**

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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.



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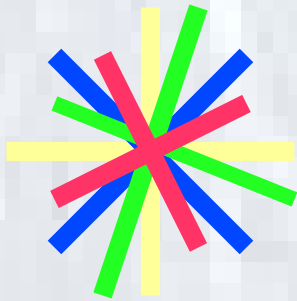
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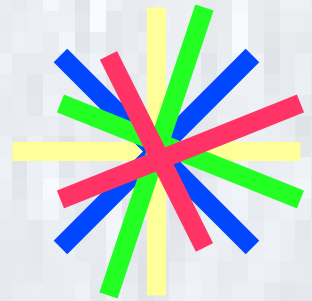
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# **LOVE FIREWORKS?**

# **THE**



# **WPA**



**(WESTERN PYROTECHNICS ASSOCIATION)**

# **WANTS YOU!!!**

**We are a group of fireworks enthusiasts who believe in the safe use of fireworks, a sharing of ideas and the pursuit of fun while doing it!**

**Western Winter Blast and Do It are our two events that attract participants from across the country! Attend seminars, see manufacturing, and experience AWESOME fireworks displays!!**

**Please visit**

**[www.westernpyro.org](http://www.westernpyro.org)**

**For more information**



# IN MEMORIAM



## Robert John 'Griz' Smith, 1943-2012

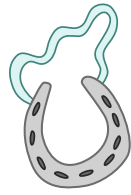
Griz was our regional vice-president for Alaska. He passed away unexpectedly on May 20<sup>th</sup>, 2012 while out riding his Harley with friends.

He was a pyro and loved his work. Griz was a man on fire, and proved true the old saying "if you find something you love to do, you'll never work a day in your life." He worked hard, and played harder, and possessed the fortitude to get stuff done, especially when it came to building stuff. Including the cabin he built on the shore of the Lake they call Woody, that has just woken up from a long Winter's Nap. He was a honey-do list destroyer, and was the first to show up if a house needed buildin or wood needed splittin. He was always there.

Griz was born Robert John Smith in St. Paul Minnesota on May 12, 1943 to Melvin and Dorothy Smith. Graduated a 2nd Lieutenant from Cretin Catholic Military Academy in St. Paul in 1961. Married in 1963. Divorced in 1974. He is survived by a long list of friends, two sisters Marjorie and Gloria, four children, eight grandchildren, and six great grandchildren.



# MARRY ME FRANCINE!



I left that in good hands.

I wanted the show announcer to say something like "before we begin the grand public display, someone in the audience wants to ask someone something special". I knew that Kief wasn't going to be announcing this year, but he stepped up and said that he would do it for me. This was to be the cue for Matt & company to fire the set-piece.

My sister-in-law Kathy Bauer was going to cue Jean Starr by radio to fire the finale after Francine said yes, Plans changed a bit, and Jean was sitting directly next to me. She whispered in my ear, "do you want the set-piece first or the finale", all along with Francine directly on my other side. I somehow let her know that I wanted the set-piece to go first.

When I originally proposed to my wife over 15 years ago, I did it in front of a bunch of fellow pyros at a Pyro Spectacular training seminar. I thought the next time I should "kick it up an notch" and do it at Winter Blast. I started back in November thinking just how should I go about this. My first idea was to approach Aaron Mayfield from AM Pyro to see if he could throw up a little something after she said yes, and he said that it would be difficult to do since everything was synced up to his CD soundtrack and he wouldn't be actually able to start and stop it before the public display. My next idea was to get a big finale cake from Flying Phoenix and have Beckie and Dimitri fire it off after she said Yes. Unfortunately the cake I wanted wasn't in stock. Then I found out my long time friend Jean Starr (with whom I worked for many many years as my producer for the show I did at a local country club on the 4th. of July) was going to be doing a demo with her new company, Bay fireworks out of New York. She said that she would be more than willing to do something for a friend.

For the set piece, I thought it might be a nice idea to approach Steve Wilson and see if it could be incorporated into a set-piece building seminar this year. He pointed out that if we did that, we couldn't keep it a secret. Sammy Brugemma did an awesome job choreographing my wife's memorial show last year, so I decided to approach him. He said that he could do it, again with the help of Beckie & Dimitri to build and set it up. Unfortunately I got word from Sammy about a week before the event that he might not make it to the blast after all.

As a last resort I contacted Matt Sutcliff from Premier Pyrotechnics to ask, since he was going to be doing something on Saturday as well, if he could build one for me on such a short notice. His reply back was "What do you want it to say?"

Matt had not given me any confirmation during the week that it was going to happen, so I still wasn't really quite sure until I heard this from Jean. I had no idea where it was going to be placed, I had originally wanted it to be near the base of the ramp, so Francine could easily see it from where we were sitting. Little did I know that they were still erecting it just before show time.

While we were waiting, Francine decided she wanted to be on my other side where Jean had been sitting. I somehow had to transfer the ring box from my left pocket to my right in case her hand got cold and she put in my pocket to get warm. Fortunately, she left for a minute to go get some of those yummy potato chips and I got the transfer done. While she was gone I leaned over to my best friend and said "Can you keep a secret?" His immediate reply was "Are you proposing?", I had not let him know beforehand, I was almost in tears telling him and was hoping I would be composed enough when Francine came back with the chips.

When the set-piece fired, I told Francine to get up and go see what it said,. She saw what she thought said FRANCINE, then something then ME, She still didn't quite understand until she turned around and saw me with the ring. Then it all clicked and then gave me a BIG hug and said "with all my heart". This was Jean's cue for the finale,

Unfortunately we won't be having the wedding at the track next year, but we are postponing our honeymoon and will celebrate it the entire week of Winterblast (and then some).

**Paul Salverson**



# WPA MEMBERS DO IT BECAUSE THEY CAN!



Join us for the premier maker event of the year - **DO IT** at Hawthorne, Nevada from September 20<sup>th</sup> to 23<sup>rd</sup> 2012. Details have now been worked out and application forms will be on the web site shortly.

The cost this year will be \$60 for members, \$25 for spouses and students, and \$10 for minors. A \$25 clean-up fee will be added, and the total clean-up collected will be divided among members who stay until the clean-up is complete on the 24<sup>th</sup>.



Unlike Winter Blast, there is no time limit on manufacturing! If you can see to work, you can build. Class B and C product will be available to order from Flying Phoenix, and powder from Bear River Powder. Accommodation is inexpensive at El Capitan motel, and there is a trailer park with full hookups for those bringing an RV. Full details will be on the web site.

***FUN FUN FUN!***

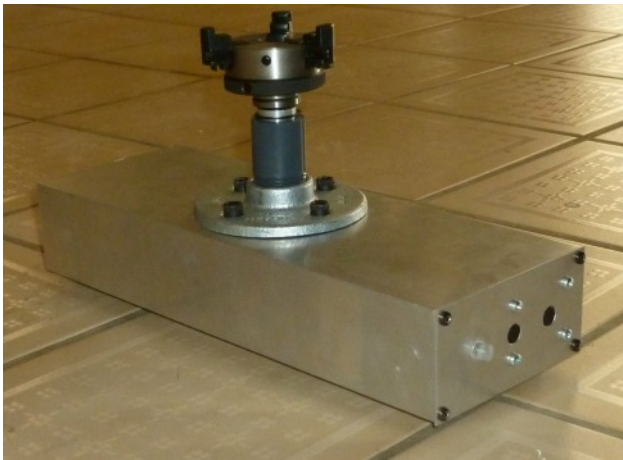
*Be there. It's a blast.*



# ROCKET TEST RIGS

One of the most difficult things to determine about a pyro rocket is how much heading it can lift. Generally people estimate, based on information found online or by word of mouth, and if they're sensible they play it safe. There's nothing more discouraging than to spend hours making a rocket and header and then to have it fall at your feet fizzing, and sprinting away before the header explodes. Only slightly less discouraging is watching it fly in a beautiful arc, power down to the ground, then explode on the highway next to the county sheriff walking his dog (no names will be mentioned).

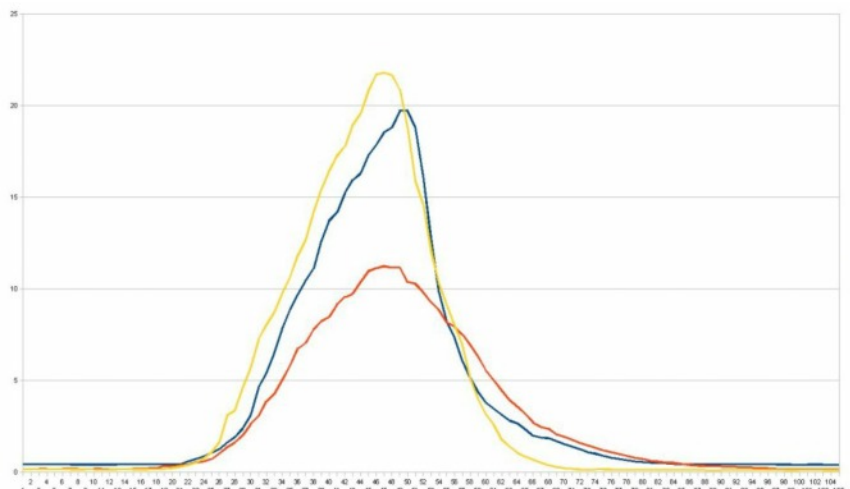
There is a better way.



Those of us who are also members of PGI will have seen Danny Creagan's series on building a rocket test rig in the PGI Newsletter. The subject has also been extensively covered on Passfire. These rigs allow you to test motors to see how much force they generate - or in rocket jargon, how much impulse they generate. Impulse is the amount of momentum generated, which directly converts into how fast the motor will propel a given weight into the sky. From this you can calculate how high it will go, and adjust the header weight accordingly.

The Creagan - Passfire Rocket rigs are fiddly to put together. The electronics is a little complicated, and setting one up and using it isn't simple. It needs a computer out there on the rocket line to take measurements in real time, with vulnerable wiring trailing from point to point. I'm an electronics engineer and I thought there had to be a better way, so I designed a rig that's completely self-contained and easy to use. It logs the force patterns internally and stores them in memory, so you can drop the rig on the ground, mount a motor, fire it and then take it to a comfortable place and upload the data to a computer for analysis, in less time than it would take you to untangle the wires for the traditional rig.

The traces on the right show the force produced by three identical 1lb ( $\frac{3}{4}$  inch) cored black powder rockets. The only difference is where the fuse ignited the core. Being able to run this trace enabled me to get the fusing right, and determine how heavy a shell I could lift with them.





There is enough memory to store 18 rocket traces at once, so you can test a whole series one after another and look at them later, although there's nothing to stop you hooking up a computer out on the line to look at them right away. As an extra widget, it has a built-in E-Match igniter with a programmable time delay after you press the Start button, if you prefer to light your motors that way.

I'm taking my rig to Do It and I'll have it set up at the line for anyone who wants to test their motors. It can handle rockets with a thrust of 200 pounds, so it will test your 6-pound whistler, should you be willing to sacrifice such a magnificent piece of work just to find out how powerful it is.

If you like it, I'll make you one.

Pete Hand

## **TONIGHT'S MOVIE HAS BEEN WESTERN WINTER BLAST 23**

***Very Special Thanks*** to Eldon Hershberger.

Eldon produced an excellent CD from footage he filmed at Winter Blast 23, and distributed it to members who attended WWB entirely on his own initiative and at his own expense.

It was a big surprise to me when my copy arrived in the mailbox, as I wasn't expecting anything. I know I speak for everyone who received a copy, that we are in awe of your generosity and truly grateful.

## ***THANK YOU ELDON!***

# The Firework Factories of India

By Peter Schoewe

**The Sai Prasad Fireworks Store in Mumbai and  
The Kala Fireworks Company in Sivakasi**

In almost every city I visited there was a smell that could have been improved. The sewers that ran along the gutters were covered with cement blocks. Many times the blocks were missing, allowing you to see and smell everything. Men and women beggars at intersections put their hands up to the taxi window and stare, unblinking, at you for a full minute before moving on to the next car. Practically any farm animal you can think of were in large and small cities alike such as Bombay. Goats being herded on main boulevards, sheep or ox jogging loose on their own along side our taxi. Chickens, cats or dogs with no owners and all animals looked underweight. Taxi drivers who know more ways to raise your fare then you knew were possible. While as much as half of Bombay is estimated to be homeless. I could go on for the next two days on this, but we're here for something else, fireworks!

## Welcome to India!

I'll start off with some facts about India and then go on to the stores and factories themselves.



Haji Ali Shrine, Mumbai, on a fine day

India has twenty-eight states and seven territories. It is in South Asia and is the second most populated country after China with 1.2 billion people and rising. It was first settled over 9,000 years ago. While civilizations started appearing as early as 3300BC. India gained independence from British rule in August of 1947 and the new constitution came into effect in Jan 1950. India continues to have unresolved territorial disputes with China and Pakistan.

Temperatures range from 70-105 degrees Fahrenheit all year in most parts, and the rainy season is different from north to South.

The official language is Hindi, yet 80% of the people I came in contact with spoke fluent

English. It is also customary to speak English in business transactions among themselves in big cities as well as guests speaking with each other staying at five star hotels.

According to the World Health Organization almost one million Indians die every year from drinking contaminated water and breathing polluted air. TB and malaria is endemic and half the children are underweight.



The president is Smt. Pratibha Devisingh Patil, born in 1934. She assumed office in 2007 and is the 12<sup>th</sup> president. She was governor of Rajasthan from 2004-07. Before being elected she was a practicing lawyer helping poor women. She's held various offices since age twenty-seven.



Marine Drive

The currency is called the Rupee and trades from 42-53 Rupees per dollar in recent years. You'll get a much better deal exchanging at hotels there than at banks in the U.S.

In Portuguese, Bombay means good bay. It is India's largest city, and since 1995 it's called Mumbai, a change brought about by the Shiv Sena party. If you talk to someone who doesn't belong to that party, you may still be corrected to call it Bombay. Mumbai is a mix of Mumba and ai both meaning mother in Marathi and comes from the city's patron goddess Mumba Devi. A temple is dedicated to her in Kalba Devi area of Mumbai.

Mumbai residents have an average income of around \$1350 a year, three times the national average. It is also where most radio, TV and movies are produced. India produces more movies than the US, but they are mostly for domestic release. Mumbai's greater area has around twenty million people with about half of them homeless. Houses or flats around Mumbai went for \$165,000 U.S. to \$520,000 for 1,000 square feet.

Some attractions in Mumbai are Marine Drive, the beach strip. The Taj Hotel which was the place of the terrorist shootings in November of 2008 as well as the Oberoi hotel, also where guests were killed with hand-grenades and machine guns. Then there's Elephanta Island with its seven caves of stone carved statues of a female god. Dhobi Ghat, a city block where over 6,000 Indians live and work washing clothes by hand. Sasoon docks with their colorful fishing boats which will soon be closed to the public. Haji Ali shrine Island at Marine Boulevard, built in 1431. Gateway of India, Malabar Hill over looking Marine drive and the Arabian Sea nicked name the Pearl of Neckless bay.



Elephanta Island



## The Firework Stores of Mumbai

India doesn't do much exporting of fireworks: less than 5% of what they produce. Many factories didn't have websites and for the ones that did, their phone numbers didn't work! Whoever answered would hand off the phone from person to person until finally someone said, "the boss is out of town for a week, call back then."

The local phone book had five firework stores listed in the outskirts of Mumbai and fourteen stores that sold fireworks listed on line.



On Monday I met with a manager of Amir Morani Fireworks at the Best Western hotel in the Juhu district. We drove forty minutes north to the Sai Prasad Fireworks store. The owner was Mr. Kekobad Khushroo. He also owns a factory two hours south of his store. The address is shop no. 7, Royal Apartment, Somwar Bazar, Malad W. Mumbai. A busy, narrow, two-lane street. This far from Mumbai many business's were only one story high.

Customers were not allowed inside. You stood at the shaded counter and asked for what you wanted. Almost everything was in sight since the store was not more than seven meters deep by three meters wide. (I will use the metric system often as this is what I was exposed to outside of the US. I want to give you more of the feeling of

being there, however you'll miss the sweating heat.)

There were firecrackers of 180mg to five grams. With twenty to several hundred crackers per pack. They call 180mg, 'lady fingers.' It's \$4 for a brick of 16/80. 2,500 Rupees or \$55 for a fifty shot cake of three inch shells. This thing was huge. Confetti cannons made in China for \$1. Many types of brands are all Indian, since import of nearly anything beside confetti cannons is not allowed.

The manager said "it's illegal to light off fireworks in Mumbai. Many people do it all the time and others call the police. When the police show up there has to be an excuse such as a wedding, holiday or religious festival. Only then would it be allowed."



Five Gram Firecrackers

During new years and the Deepavali (Diwali) holiday in October/November there's a line of people four blocks long at this store. They had a storage yard ten minutes out of town with semi trailers full of fireworks.

While the sales rep talked to a shopkeeper I was allowed inside, we stayed for twenty minutes. A younger man followed, but he never knew the prices of anything, so he kept asking his boss.



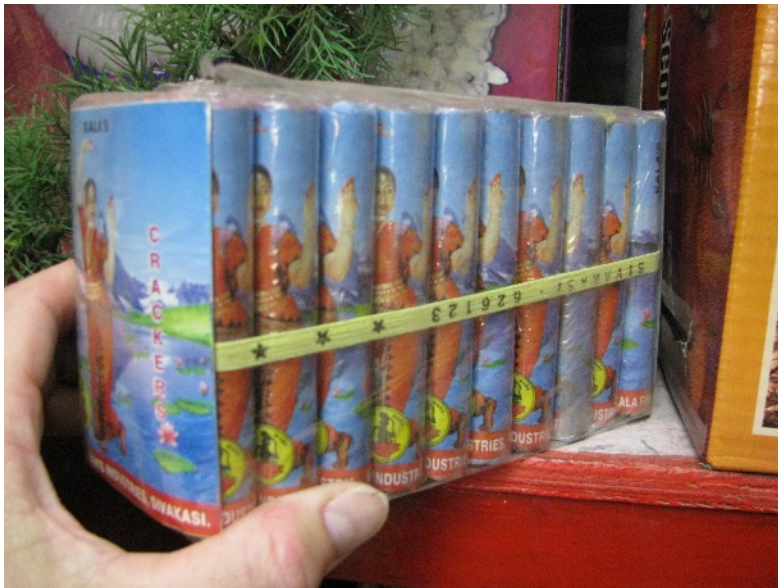
My mind was filled with the thoughts of fireworks of India that I had seen photos of on line in the US and there I was in the middle of it. Holding a pack of 180mg 'lady finger' crackers didn't happen everyday. These were products that you almost never saw outside of the country.



The manager told me he knew one of the factory owners I would see in the south later that week. Many of the products sold in his shop are made there.



Artillery shells (left) and cakes at Sai Prasad Fireworks Store



2 Gram Firecrackers (above)



Inside the store (right)



We took the taxi back to my hotel. Along the way we dropped the factory manger off. I handed him a post card of San Francisco. Taxi drivers in India like to take you half way to where you're going, then pull over and demand more money. They may not move until you agree to pay the higher fare or they'll take your luggage out and leave you there. Horn honking was more intense then in China.

From my room I called the other firework retailers. Only one answered and she spoke in English without missing a beat. I asked for directions.

From the US I had also arranged to meet with Mr. Altaf Dawoodani of Fireworks Magic. His factory was two hours south of Mumbai, but closed this time of year. So we were going to have a talk at his office instead. Most factories will close two months a year during their rainy season as drying product outdoors won't work, and they don't have large manufacturing rooms as they do in China to dry indoors. Mr. Dawoodani said "I get calls all the time from people out of the country wanting to buy only a few boxes." I said I was not there to do that. "My mother and I are sick so we cannot meet." he said.

After lunch at the Best Western I got food poisoning. I laid in bed under the sheets freezing and going into shock, instead of going out that afternoon. With the windows open and air-conditioning off the room must have been 95 degrees Fahrenheit. By ten AM the next morning with a bad nights sleep I felt better. I went out and saw another fireworks store.

I had diarrhea for the next ten days. I hear most everyone visiting there does, even returning Indians.



Mumbai in July

There was no rain for the first half hour of the taxi ride, but then it started pouring. Streets were flooding more than ankle deep and stores were only knee high. Store owners used sand bags and boards to keep the water out. On side streets, shops had one large roll up door for an entrance going the width of the store. Shop keepers stood their and watched the water go by like a river flooding from one side of the street to the other.

My taxi driver wanted to take an underground short cut, he said that street was flooded.

By Now water was coming right up to the bottom of the cars, and finally got into my taxi. We arrived at the street for the fireworks store, but the police blocked the road. They knocked on

the taxi drivers window and told him to keep driving.

We saw no flooding where we wanted to go. The driver said it was down that street. I didn't feel like walking in pouring rain even with an umbrella, it could be four long blocks or more for all I knew.

I told him "back to the hotel." Umbrellas don't work in these countries. It will keep your head dry, but from your shoulders down you'll be drenched. At least the kids enjoyed sliding down some of the steep streets in the water.

## The Kala Fireworks Company in Sivakasi

After visiting as many tourist attractions as I could in four days, on Wednesday I flew south to Madurai. At around 9pm I was picked up at the airport by Ravi of Kala Fireworks. It was a forty-five minute drive west to Sivakasi.

There were hundreds of bicycle riders coming home from work at 10:30 at night. Did they all work at firework factories? Sivakasi has a population of 76,000 and at least 20,000 worked in fireworks!

The Bell hotel had been built only eight years earlier. It's owned by Standard Fireworks. The next day I would find out why it was called the Bell hotel. At 5:30am the Temple next door rang its bell for half an hour. Then again (for half an hour) at seven and periodically throughout the day. This



Sivakasi



Temple next to the Bell Hotel, Sivakasi

was going to suck. It was there I discovered the meaning of a five star hotel. It meant one can expect no more than five hours of sleep at night and I was staying at a three star.

Heavy rains come only three months a year, the rest of the year it is bone dry. Since 2004 the rain was getting less and shifting to later in the year. Because of the monsoon season in the neighboring state, we had clouds most of the week giving us a temperature of no more than eighty-five degrees Fahrenheit. The rains would arrive the following month.

Kala Fireworks consists of at least three factories, as well as a tofu plant at a different location. It was about twenty minutes to the first factory and the same to the others. In many cases factories were in the countryside, but not always. Anywhere from 30-80 people worked at each factory. The larger two factories looked to be about twenty-five acres.

At most factories, chemicals were stored in a building near the entrance. The doors were made of steel and the buildings were of cement or cinder block. From one factory to the next, the chemical storage buildings were similar: one room for oxidizers, one for fuels such as Aluminum, and another for Sulfur. Doors had to remain open at all sheds and work rooms during manufacturing.





Chemical Storage



Cutting tubes and filling hoops

tubes and with a paper cutter cut them into the length of the firecrackers. Later the tubes would get put into the hoops.

One man demonstrated putting clay into the ends of empty firecracker tubes. Over 200 aluminum hoops about twenty-five centimeters across were packed with empty firecracker tubes. With a swath of clay from his hand he filled one end of the tubes and then let them dry in the sun for a few hours. Another worker would put tissue paper on the other side. The hoops were then put in a storage building and waited to be picked up by another worker.

At larger factories that I toured later in the week, there was a man in charge of chemicals. He knew who needed what, and he would weigh this out into what looked like a stainless steel bowl. The bowls were set on the cement floor in rows. Fireworkers would pick up what they needed and carry them to their work area to get mixed there.

Firecracker tubes were made by rolling a white paper around a wood dowel with a bit of glue on the end of the paper. Each tube was about 25cm long. When dry, a thin red paper was wrapped around. Then a man would take a hand full of paper



Plugging firecracker tubes with clay



In a manufacturing building a woman would take a small wood stick and punch a hole into each cracker that was covered with paper. This kept flash powder from falling between the tubes and getting stuck to the outside of the crackers.



We walked to one mixing building where flash power was put into firecrackers. My cameras and cell phone was left with a worker outside. This was common at all factories.

There were over thirty cinder block manufacturing sheds with up to four people in each. These buildings were about three meters square with a three meter high cement wall around them for extra protection. Inside, the flash powder was mixed and put in by hand. At least one factory in China put flash

Left: Manufacturing shed

powder in by hand as well. The man would sit on the floor in a Sarong. It was common to see men without shirts or shoes. The men mixing the powder were always covered in flash powder, they were shiny silver over most of their bodies. It was a sweating hot job. This flash power was a mix of -325 mesh 'Pyro grade' Aluminum, Potassium Nitrate and sulfur.

Sitting on the floor was required at all factories. Depending on what's being manufactured the law prohibits fireworkers to sit on chairs in fear the legs of the chairs may set off a spark with chemicals on the cement floor.

Stacks of filled firecrackers, still in their hoops were near the man on the floor. Another worker put these on a cart outside and took them away. In another part of the factory a woman took a hoop of firecrackers and while sitting on a blanket under the shade of a tree, by hand put in a small amount of



Below: Silver man



Left: empty aluminum powder drums



sand or clay depending on the factory. This was to keep the powder from getting wet. In China, when making M80s they used bentonite clay inside to keep the flash powder from getting wet with silicon.

A dried black powder fuse was dipped into a black powder slurry and slid into the fire cracker tubes one after the other. When finished this hoop of firecrackers was set in the sun to dry before being taken apart.



Above: fuse drying

After a few hours, they were taken apart over a drying platform then taken into a manufacturing building where they were tied together into strings. The stacks of stringed firecrackers were taken to another building, where they were wrapped by hand with a thin red or clear paper and a dab of glue. A label glued on then put into bricks, and boxed. The boxes were taken to a storage building in the back, ready to be shipped. The storage was at least fifty meters from any other building.

Fuse was made in another manufacturing shed. A man stood with a roll of cotton string on the floor behind him on a spindle. The string went up to an eye hook on the wall behind him,

Below: assembling firecracker strings

then into a bowl of black powder water/slurry mix. There was a weighted object in the bowl that made the string go under the slurry. As the fuse came out he used his bare finger on one hand to wipe off the excess slurry. The fuse was wound around a drying rack by motor. He guided the fuse so there was some space from one strand to the next. When this rack was full, it was taken off its supports and carried outside to dry in the sun.

Once dry, the fuse was cut into lengths of the height of the drying rack almost two meters. Then bundled together in the size of a large handful and cut shorter to about forearm's length. From there the fuse was ready to be wrapped. The rack itself was made up of six 2x2s with a metal pin sticking out each side to be supported on as it spun around.



While sitting on the floor in a manufacturing building a woman put on a piece of tissue, then wrapped it around using her hand on her thigh for friction. She did this several times until the white tissue was tightly wrapped around the fuse.





Ground spinners

At this factory as with many others, they made ground spinners. A thick fuse made of a colorful paper tube was filled with comp, wrapped and glued around in a circle. A label was glued on top with a plain paper disk on the bottom. When lit this fuse gave enough thrust to spin it on the ground.

Cone fountains are made by hammering in the comp with only two whacks. This produces a fountain that lasts about two seconds. It's a really fast way to make a fountain.

At various locations there were drying platforms made out of cement. Some factories would dry products on plastic tarps or burlap as well. But if the ground was wet from a recent rain, the cement would dry quicker and not be muddy.

The doors to the work sheds at the factories I visited were always painted blue and were either out of steel or wood.

From here we left to Ravi's soy plant. The soy plant was at a different property. There was made such products as: soy milk, cubes and colorful chocolate coated and uncoated soy nuts. The whole process of cleaning, roasting, coating and packaging was done there. The samples I tried tasted great!

We stopped by at least two more factories that afternoon, where firecrackers, fountains, and other firework products were being made. Along one country road, every set of buildings was a fireworks factory.

There were at least 450 firework factories in Sivakasi, with about fifty more spread through out India, which has the second largest number of factories in any country outside of China.

Payday was normally Saturday. As in other Asian countries, they worked six days a week. However this weekend was a holiday. It was when Tamil Nadu became a state. This is celebrated by having three days off, going out for picnics, travel, or staying home with guests coming over for dinner. Not with

fireworks. In addition to national holidays, each state in India has its own New Year's when it became an official state. School children were always in uniform. Each school was allowed to chose their colors. Most children walked barefooted on the hot black asphalt roads.



Riding home from school



After dinner at the hotel, I was picked up to see a demo. About twenty of us watched 1.4G mortars and fountains go off. The height, color and spread was good.



From there we stopped by the office of Asok Sparklers. It was 8:30pm and dark out, but office workers were still there. It was common to work till 9pm, with two hours for lunch from 2-4pm.

Sparklers are big in India. Where they make many different lengths and types. However Asok Sparkler came up with a new marketing plan the previous year: the bar code. After getting the sparklers cleared with the government that they are as safe as matches the code was allowed. Now they are sold in stores through out India.

So far Asok Sparklers had been in business for nine years. They had at least fourteen different sparklers, the longest was a meter. Mr. Asok said he had been making enough business that he



IF YOU WANT TO STAY FRIENDS,  
DON'T ASK FOR MONEY

hadn't thought about exporting. He feels his product had become recession proof. No one else had the barcode on their products. More people in India buy sparklers for birthdays and many occasions than any other firework product. They can be used in front of apartments and on balconies where other type of fireworks can't.

A sign behind his desk said in Hindi. "Let us keep our friendship by you not asking me for money." As often as three times a day, political party reps and religious types come in for money. You will get badly harassed in Mumbai and other large cities by taxi drivers and beggars. But in Sivakasi these types go door to door. That was a relief. The following Friday Mr. Asok was taking his entire company of workers from his two factories (of around 115 people) on vacation for 3 days. Some factories in China do the same.

For the most part, India doesn't have earthquakes. It's why they can get away with buildings made out of cinder blocks or cement. The land mass of India runs into China, which gives southern China earthquakes instead.

Over the past six years the drought was getting worse. More people were having a water container put on their roofs. These extended droughts started when the Tsunami hit in 2004. City water was becoming more polluted with silt as the water levels got lower near the end of the dry season.



In the next part we will visit an aluminum atomizing plant, a match factory and a potassium, barium and strontium nitrate plant.

## Footnotes:

Page 15: Mumba Devi Temple: [www.cultureholidays.com/temples/mumbadevi.htm](http://www.cultureholidays.com/temples/mumbadevi.htm)

Page 16: Sai Prasad Fireworks: [www.Moranifireworks.com](http://www.Moranifireworks.com)  
Deepa vali (Diwali) holiday: [www.Deepavali.net](http://www.Deepavali.net)

Page 18: Fireworks Magic: [www.Fireworksmagic.com](http://www.Fireworksmagic.com)  
City information: [www.Mumbaikar.com](http://www.Mumbaikar.com) (Type fireworks in search)  
A display operator: [www.Mumbaifireworks.com](http://www.Mumbaifireworks.com)  
City news: [www.Themumbaicity.com](http://www.Themumbaicity.com)

*"Madurai to become a slum free city by 2012. With an ambitious plan of becoming a slum-free city, the Madurai Corporation will construct 30,951 houses and improve the infrastructure in 208 slum areas for the benefit of the poor in the next five years...."* [www.thehindu.com](http://www.thehindu.com)

Madurai is in the far south of India and is the airport city for Sivakasi.

Hindi rock and other songs from India are on Youtube.

Ravi of Kala fireworks may have time to give you a tour of his factories for a fee if you're interested in visiting.  
He can be reached at [TOFUWALA@GMAIL.COM](mailto:TOFUWALA@GMAIL.COM)

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