December, 2009, Vol 20-3

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 1.4G and or Glen for 1.3G.

WPA Newsletter, Volume 20, Issue 3

September, 2009
Volume 20, Issue 3

Western Pyrotechnics Association
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Inside this issue:

Note from the Editor	1
President's Message	2
From your VeeP	4
From the Secretary	4
From the Treasurer	5
Controversy Abounds	5
Water and Pyro	6
Chemical Hazards and Poisons	8
Blue is blue. Or is it?	11
WWB XXI- The Sky's The Limit	13
A Note About the Cover	14
Flight of the Twizzler	15
A Tour of Chinese Fireworks Factories	20

Let's Blast Outta Here!

By Tom Calderwood, V.P. Publications

NOTE Because of a computer virus, Board Meeting minutes were not available by the time the newsletter was ready to go. They will be included on the next newsletter.

I need to apologize for this newsletter being late, but I had some serious family issues which took my out of commission during the holidays. I'm back, so let's kick it into high gear!

In this issue, we continue with Peter Shoewe's write up of his visit to some Chinese fireworks factories, complete with pictures. Very interesting reading!

Peter also sent along some pictures of a barge show in the S.F. Bay area. I've been on a couple of barge shows, and I can tell you it's twice (three times?) the work, but twice the fun. That, and you'll have some great stories to tell. If you have any pictures of unique fireworks related sites/ situations you'd like to share, please send me a note!!!

Bob Forward also submitted a companion article (complete w/videos) of his ongoing Candy Rocket experiments. I think he's come up with a rather unique solution for spin stabilization.

Charlie Wilson has an excellent article dealing with the toxicity levels of different chemicals that might be found during a manufacturing process.

I also did a write up that was the result of some conversation on the PML after I posted pictures from the PGI convention, and how different colors may be perceived differently between a camera and the eye.

I can hardly wait for WWB so we can talk about the new Do It site possibilities. As with all things, there are good points and bad points to everything. It was nice to have folks say to us "We WANT you to build and shoot your fireworks HERE!" You don't hear much of this in California - that much is certain. Oh, and all fill pictures are from WWB XXI. — Tom

Important Notice:

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What's Happening!

By Pete Wood, WPA President 2009

First, I'd like to wish all of the members, vendors, display companies, sponsors and my fellow BOD's of the WPA, a very Happy and Prosperous New Year! I think I can speak for many when I say, 2009 won't be missed and that we'll all look forward to a brighter New Year and hopefully, an improved economic picture.

Now, as the Holidays are behind us, we can now focus on the clubs main event of the year – Western Winter Blast XXI. While we won't have the extra day this year that we had for the anniversary, there is still much in the planning to do and watch during our four day event, starting on February 11th, thru the 14th and ending with clean up on Monday the 15th.

As usual, we have a great lineup of nightly displays and demos, The Grand Public Display for this year, will be presented by Homeland Fireworks of Jamieson, Oregon and after seeing the proposal, I can assure you that there won't be a lot of dark sky on Saturday night.. Extreme Pyrotechnics LLC, whose Corporate Offices are located in Mansfield Texas, will provide us all with not one but TWO nightly displays during the event, for our viewing pleasure and entertainment. They will give us an opening display on Friday night and a closing show on Sunday night.

There will be a tribute show by Fireworks America, for our recently departed pyro-friend, Bill Daly, following Friday nights Extreme Pyrotechnics display. Following that, a special segment produced by our very own life member, Bill McGregor entitled "A mine is a terrible thing to waste". Knowing Bill's twisted imagination, I can only assure you that it will be a surprise for all!

If you would like to provide a display or demo, contact Kief Adler at - kief@sbcglobal.net and let him know of your intention(s).

Along with the displays and demos, of course, will be seminars (provided by the WPA Seminar Slave aka Steve Wilson) for your daytime enjoyment. Any and all that are interested in volunteering to put on a seminar or even just to help with setup and logistics, please contact Steve at - firefun@comcast.net . I'm sure he will appreciate any and all help.

As usual, there will be class C (1.4G) vending on site. Many of our vendors come long distances to provide us with our much needed gear and paraphernalia. Please visit these supporters of our club and in return, support them. All B product (1.3G) must be pre-ordered, as Jim with Flying Phoenix won't have excess stock available on site. In order to place your pre-order, contact Jim, Becky or Glenn with Flying Phoenix at – flyingphoenix@tcinc.net or call them at (307) 856-0778. You can fax them at (307) 856-3336. Any members purchasing 1.3G product using the club's license will be required to put in time at the "B" magazine. You will be asked to signup for your shift in advance of taking possession of your pre-order. Those not fulfilling their shift will lose the privilege in the future for ordering "B" product.

There will be supplies being vended for those folks in manufacturing. For further details, contact Tim, via email at - nightlighterfireworks@yahoo.com.

BP sales are available as well. Please contact Craig at - Bear River Powders 1-307-679-0886 or by email at - bearriverpowder@allwest.net.

Craig can answer all your questions and concerns regarding current BP sales requirements.

If you are considering vending at this year's convention, please contact our Vendor Chairperson, Ann Huffman at - doxie_4@live.com and let her know. Ann can help you get started or answer questions you might have.

As I wind down on WWB XXI, I just want to say that the WPA is a club made up of volunteers. If you wish to get better acquainted with the club or make new friends, then by all means volunteer! There will be a volunteer signup sheet at registration. I urge all to sign up if only for a two-hour shift on Safety or Security. Many hands make light work of a heavy task.

If you are wanting to camp in an RV, you can do so for a small fee. For details contact our Camping coordinator, Kirby Nellis at ksnellis@gotsky.com and he'll fill you in on the process and the fees.

Again this year, we have allocated approximately 1/3 of the outside parking lot for our membership. We are going to improve on last years accessibility for those requiring special needs in order to get from their vehicles to registration. If you need to have transportation due to a medical condition, please contact any staff member or volunteer and ask that they radio for a shuttle. We will accommodate you the best we can and as quickly as we can. If you currently have a handicapped condition, please contact our Registration Chairman, Don Oesterle at MadDogPyro@socal.rr.com, and make your condition known in advance. This will help us to help you.

Your WWB XXI Chairman is Lynden King. You can contact Lynden at skyking2004@elkgrove.net and the event Co-Chair is yours truly, Pete Wood. I can be contacted at pete@westernpyro.org . Feel free to ask us questions you might have and we will either answer them or refer you to those that can.

The Annual Boy Scout Pancake Breakfast will be held on Saturday morning at Sara Park over by the registration booth. Please come out and help support this local Troop and enjoy a great breakfast at a very reasonable price. The hours of operation are from 8:30AM – 10:00 AM. Don't miss out on this annual tradition.

Here again, we will have the WPA Auction happening at the track as well on Saturday (TTBA) in the bleacher area behind registration. This is a great way to add to your pyro collection or to get rid of some

of those 12" shell casings you've had on the kitchen table for the last year. For more info or to make your donation known, please contact Kief Adler at kief@sbcglobal.net.

The general business meeting! Ah! The favorite place for the membership to come and throw baseballs at the BOD's as they sit over the dunk tank! How could anyone miss this? No, Ok – no dunk tank, but it is YOUR chance to come and voice your questions and concerns in the club goings-on. It's held at the Aquatic Center (just South of the host hotel and on the opposite side of 95) at 10:00 AM on Sunday Morning and usually runs until noon. Please come and have your voice heard – after all YOU are the WPA – it's up to your input and votes that determines how things will be handled in the coming year(s).

We will have a presentation on future WPA DO IT site selection, by WPA member John Dicks, Tom Calderwood and myself after we took a week off and visited three potential new sites in Northern Nevada. John deserves a lot of thanks for all the time and miles he invested in trying to coordinate our meetings at these three sites. Thanks John!!

There is the possibility that a site might come available in Mesquite, NV as well, and if all works out time wise, Rob Foelek might give us an insight into this site. He's awaiting more info from local officials as to the availability of this site, thus the uncertainty at this time of whether this will even fall into the category of a "potential" new site. Come to the meeting and find out.

There will be a very controversial subject, coming up for a vote by the membership, and that is of us (the WPA) amending our by-laws to now lower the age for those wishing to manufacture, from the current age restriction of 18 years of age, and lower it to 13. This would entail parental involvement, not just consent. Many guidelines have been drafted; the insurer and club attorney have been contacted, consulted and signed off on this change, should the membership vote to do so. Much more will be presented at the business meeting regarding this, so if this seems important to you, please attend and make your opinion and your voice heard. Otherwise, others will make these decisions for you.

We will hold elections this year for the position of President and for Treasurer. All Area VP's come up for re-election each year, so if you can, and are already an area VP, please attend so you can either accept or decline your nomination. If you can't be there, please let any of the BOD's know in advance of your intent. Anyone wanting to run for an area VP position, please attend and have someone from your geographic area nominate you for the position.

I might as well take this time to say that it's been a great honor and pleasure to serve the WPA as your President for the past two years. As many of you know, I tend to run on a more liberal platform then some before me. This is just a reflection of how I see the club being able to move forward, grow and still remain within the ever tightening guidelines that we face year to year.

My desire to see the WPA return to "it's roots" with an increased focus on manufacturing, display creation and execution, safety and chemistry are just a few of the areas I see that can help us stay alive, attract new members, yet still stay within the guidelines that are currently being mandated for our hobby. Nothing is easy – yet I enjoy the challenge.

So, I hereby announce my desire to run for another two-year term as your President, should you decide to have me.

That's all for now, and hopefully I've said something that might have caught your interest.

We will be looking into mentoring up and coming new candidates for positions within the club, such as DO IT Chairman and CO-Chair, and if you would like to be on Staff (or think you would) please contact one of the many Staff Chairmen and Women and ask. That's how it all starts. We look for people who approach us with the desire, rather than having to go to the local taverns, late at night by the seacoast, and club you over the head. Eventually, McGregor and myself will be too old to do this and so we need fresh, YOUNG blood to take the reins.

Think about it and see us if you have an interest.

Looking forward to a great WWB XXI and seeing all of you there!

Be safe and be smart!
Over and out!
Pete Wood
WPA President 2009 - 2010?

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#59) 2009 Western Winter Blast XX - 20th Anniversary. 2 DVDs. $25.00.

#60) 2009 PGI Convention at Mason City, Iowa. 8 hours, 4 DVDs. $40.00.

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From the VeeP

By Kelly Goebel, WPA Vice-President

WINTER BLAST! It's that time of year again and I can't wait. It's been a year of turmoil for most of us, myself included, so this is an event that I just can't live without. My friends and colleagues… let's do it right and have some fun.

In the meantime, we have some ideas before us…

One in particular is educating minors in manufacturing and shooting Class B. I'm for it. There are valid arguments to both sides of the table; allowing or disallowing. I believe our members, who are parents first, will always err on the side of caution and protect their children, other members and the Club as a whole. I do not discredit the vocal opposition; I completely acknowledge and respect it. But I feel that we should have a freedom to choose. Our staff is top-notch and will oversee all operations. Our federal and state laws, our attorney, our insurance company – they **all** support it. I do not feel that we need to legislate a ban on minor participation. That should be a choice for the parents.

The up-side is huge! We can instill a lifelong love for learning and the sciences in our kids. How many of us can't remember much about our youth… but we remember the big moments. Eye-opening experiences that push us in the direction to do what we were born to do. We have a chance to do that and I think we should.

My two cents.

Let's have a great time in Havasu. We've all earned it.

Kelly

From the Cushy Armchair of the Secretary

By Kathy Bauer, WPA Secretary 2009

Welcome to the New Year!

The secretary's job at this time of the year is a very busy one. Membership renewals, new memberships and registration for WWBXXI, "The Sky's the Limit!" have been keeping me working hard.

Thank you all for getting your memberships renewed. Thank you for inviting new friends to join our organization. Thank you all for being patient with our on-line registration, which has been giving some people head-aches.

Although, I do know there are a few of you who have not sent in your membership renewal as of yet. No worries; the year is young. I'll wait patiently for yours to arrive.

See you in Lake Havasu!
Kathy Bauer

Classified Ads

Do you have a classified ad to place? Please send Tom a note at tom@westernpyro.org and he will get it into the next newsletter. Stuff to sell? Looking for something? Let'em know!

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A Word from the Treasurer

By Deb Ludwig, WPA Treasurer 2009

From your Treasurer: I hope you all had a great holiday season! In these economic times budgeting has never been more important. Make cut backs where needed and plan for the whole year. One thing to never cut from your budget is your WPA membership and Winterblast! If you do anything all year long for fun it should be to go to Winterblast. Our numbers are a little low for this time compared to prior years. We only have a few more weeks til Havasu and we all want you go get your pyro thrill so dig deep into that budget and renew /register for the blast today!!! I hope to see you there!!!

Debbie

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Please preorder electric matches and other products for WWB as the on site sale of electric matches is prohibited by the ATF. Pickup in the Class C vending area.

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website: www.Pyroam.com
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Controversy Abounds

By Tom Calderwood

If you are not on the WPA email list, then you've been missing out some great discussion on a controversial proposal by the board. This is a note so that when folks arrive at the General Meeting, they'll be prepared for some lively talking.

The board is proposing that we will allow certain minors into areas that are currently off-limits to minors—namely manufacturing and Class-B firing.

Some of the important parts:

- Minors must be 13 years and older and they MUST be accompanied by a parent or legal guardian whenever they're in a restricted area.
- The application must be submitted before the event.
- During manufacturing, the minors will be restricted from certain areas where highly energetic material is being handled.
- The parent/legal guardian will be responsible for the behavior and actions of the minor. If there is any misbehavior, then the minor will loose the privilege to enter a restricted area.
- The parent/legal guardian must sign a waiver.
- Waivers and guidelines have been reviewed and endorsed by our legal council and insurance representative. It is modeled after the PGI guidelines for their admission of minors 11 yr old and up. Our entire board and the chairman of manufacturing endorse this idea.

The board could have made this regulation into effect on their own, but they realize that this is a hot-button topic for some so it will be discussed and voted on during the WWB general meeting.

Why are we doing this? The purpose of our club is to instill and foster the art and hobby of pyrotechnics. I personally saw this in action at the last PGI convention and I could hardly wait to see it in action in the WPA. Be sure to attend the general meeting for more information.

Who Says Water and Pyro Don't Mix?

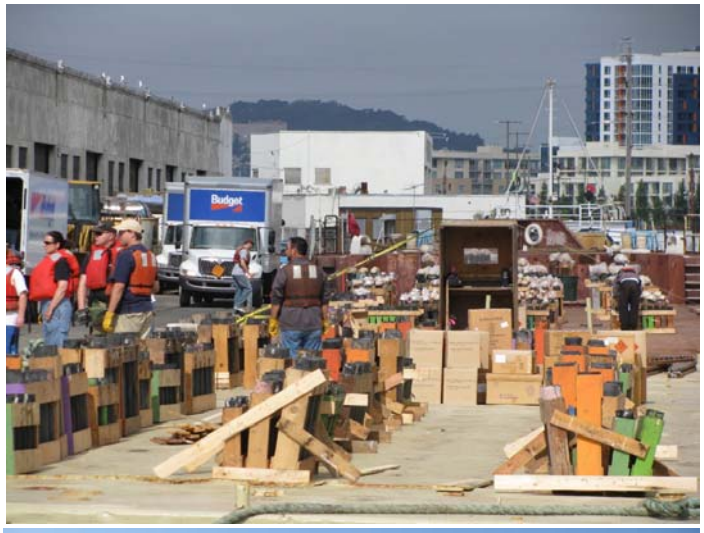
A Pictorial by Peter Shoewe

Peter not only wrote the article on touring the Chinese fireworks factories, but he sent me some pictures to share of a fireworks barge show in the S.F. Bay area. I've been on a couple of barge shows, and I can tell you it's twice (three times?) the work, but a lot of fun. That, and you'll have some great stories to tell.



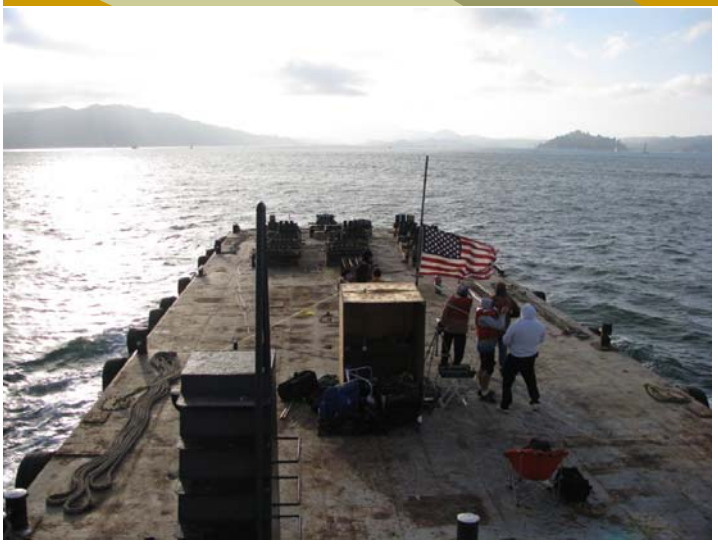






















Chemical Hazards and Poisons in Pyrotechnics

by Charlie Wilson

(When some of our members look into manufacturing their own materials, a big unknown is some of the inherent dangers posed by mixing chemicals. Not only in their reaction, but in the possible toxic effects it can have on the human body. Charlie forwarded this article as a good reminder of what is, and what is not, safe to mix. Be sure to completely understand the chemicals you are using by reading up on reliable materials and asking knowledgeable people.. —ed.)

Terms used:

LD Lethal Dose

LD50 Lethal Dose to 50% of the animals tested, usually rats or guinea pigs

LC Lethal concentration

Cyanosis When hemoglobin in your blood loses its ability to deliver oxygen. In severe cases this causes death.

hygroscopic When a chemical has the property of taking on water from moisture in the air.

Pyrotechnic chemicals that are documented poisons:

(Source: The Merck Index, 11th edition)

Barium Nitrate (or chlorate) LD50 20.10 mg/Kg in mice.

Potassium Dichromate, no LD given, but documented as a corrosive poison.

Potassium permanganate LD50 1.09g/Kg

Boric Acid (Boracic acid) documented cases of 5-20 grams causing death in adult humans!

Copper acetoarsenite (Paris Green) LD 100mg/Kg. Note: primarily from the arsenic content. Other copper compounds were not documented as particularly poisonous.

Lead nitrate Poisonous, no data.

Lead dioxide (brown lead) LD50 200mg/kg in guinea pigs PbO2

Lead monoxide(litharge) LD50 430 mg/Kg in rats PbO

Lead tetroxide (red lead, minium) LD50 (subcutaneous) 220 mg/Kg O4Pb3

Vanadium pentoxide is reported to cause gastrointestinal disorders.

HCB hexachlorobenzene: The maximum allowable daily intake is reported to be .0006 mg/Kg. Believed to be a potent carcinogen.

Dechlorane, Mirex and benzene hexachloride – "Lindane" insecticide are similar.

Undesired Reactions

Metal fuels

When chemicals are wetted with water, several things can happen. Magnesium and some other metals will react with water to form hydrogen gas and magnesium hydroxide. In the presence of an alkali nitrate, aluminum will also react with water.

Magnesium should never be used in water bound compositions.

The decomposition of aluminum with sodium nitrate is :

$3NaNO_3 + 8Al + 12H_2O \rightarrow 3NaAlO_2 + 5Al(OH)_3 + 3NH_3$

In words, sodium nitrate aluminum and water react to form sodium aluminate, aluminum hydroxide and ammonia gas. This is the well documented "Deathmix" reaction which occurs in unbuffered nitrate/flake aluminum compositions. The nitrate in question could be any soluble nitrate.

Corrosion of aluminum powder is also markedly accelerated by soluble copper compounds. Addition of aluminum powder to a blue star composition is stupid. (discuss copper compounds)

Iron powder corrodes quickly, and must be protected in pyrotechnic compositions. This can be done with Linseed or hot flaxseed oil. Unprotected iron powder will

likely become iron oxide within a day!

Double replacement "metathetical" reactions

These are reactions which you may not expect to take place, but which will happen because one of the products on the right side of the arrow is less soluble than the original ingredients. Here are some bad combinations:

$NH_4ClO_4 + KNO_3 \rightarrow KClO_4 + NH_4NO_3$ (hygroscopic – discuss)

$Ba(NO_3)_2 + Na_2CO_3 \rightarrow BaCO3 + 2NaNO_3$

$KClO_3 + NH_4ClO_4 \rightarrow KClO_4 + NH_4ClO_3$ (boom)

Also note that impurities in chemicals can cause unwanted reactions. For instance, it is common to find barium sulfide present in samples of ceramic grade barium carbonate, and the same is true of strontium sulfide in strontium carbonate. This happens because the precursors of these two carbonates are the sulfides. The sulfides are more soluble in water and will attack aluminum.

Sensitivity

So many old compositions from years ago have already been abandoned that many are not even documented in modern texts. Armstrong's mixture and other pressure sensitive compositions are best left alone.

Probably the most notorious sensitive compositions that are commonly used in pyrotechnics are the various flash powders and whistle mixes. Flash powder containing antimony sulfide is much more friction and shock sensitive than straight 70/30 standard flash. Sulfur has also been implicated, although Dr. Shimizu uses it in his "thunder" compositions.

Whistle mixes using potassium perchlorate and a benzoate or salicylate are typically catalyzed with a copper or iron salt, and then phlegmatized with petroleum jelly or mineral oil. This greatly reduces sensitivity, but these compositions should never be rammed – only pressed.

Recently it has been found that certain strobe compositions are also more sensitive than one might expect.

And of course there is the famous no-no of chlorate(s) with sulfur. There are some PGI shell makers who use chlorate based color stars that are primed with black powder which contains sulfur. Since the sulfur in the prime is not intimately mixed with the chlorate of the star, the technique has apparently not caused problems. The priming 'crumbs' left over after dusting these stars with prime should be disposed of carefully since they are dangerous.

A blue star composition containing ammonium perchlorate, copper oxide and sulfur has been found to be too sensitive for practical use. Copper catalyzes ammonium perchlorate.

(data from Dr. Shimizu's studies, p. 319 in FAST will be presented).

Spontaneous Combustion

The only likely problems for pyrotechnics are the chlorate/sulfuric acid discussed above, the "deathmix" reaction above and the formation of unwanted ammonium chlorate.

A very famous pyrotechnist and PGI charter member, Bill Hoyt and his wife were killed in a horrible explosion which completely destroyed their house. There is good reason to believe that the beginning cause of the accident was an "electric green" star composition which Bill had been working with outside of his house when it started to rain. He brought the composition into his basement. The composition probably contained:

Barium chlorate
Barium nitrate
Aluminum, flake
shellac

This is the "deathmix" that is least understood by most people. What happens is that the (unprotected) aluminum reacts with the nitrate to form ammonia gas. When sufficient carbon dioxide is present, ammonium chlorate can form from the barium chlorate. Ammonium chlorate is highly unstable and will spontaneously explode from the elevated temperature caused by the nitrate reaction.

Other examples of spontaneous combustion are two part mixtures of either potassium permanganate or calcium hypochlorite with a polyhydric alcohol. Nei-

ther of these have a place in pyrotechnics.

SOLVENTS

Non-aqueous (no water) binding of stars typically requires an organic solvent which can in some cases be poisonous when present in sufficient concentration. The following solvents may be found usable in some pyrotechnic applications:

Ketones:	Acetone Methyl Ethyl ketone (MEK)
aldehydes:	butyraldehyde
alcohols:	Methanol Isopropanol Ethanol
Esters:	Amyl acetate
Cyclic:	Touluene Xylene Tetrahydrofuran (THF) Cyclopentanone

Acetone and MEK find use in the making and thinning of nitrocellulose lacquer. Acetone has the unfortunate tendency to absorb water, and without any water is not very stable. MEK is not hygroscopic, however it is more poisonous. MEK is a good solvent for almost any plastic except polyethylene, polypropylene, and saran.

There is no solvent for polyethylene, which is why there is no such thing as a polyethylene glue – other than melted polyethylene itself. This is what hot melt glue is.

The alcohols are important in star compositions for two reasons: they lower the surface tension of water making it absorb more quickly, and some pyrotechnic fuels are soluble in alcohol. These include Shellac, Red gum, Rosin and Vinsol.

The aromatic or cyclic solvents that I have listed may be found in some exotic applications for compositions. One expert has documented making PVC based stars using THF as the solvent.

Xylene is a practical solvent for polystyrene. Any polystyrene refuse such as packing peanuts, plasticware, plates, cups, and even the plastic backing plates that are used for hamburger packaging can be dissolved in xylene to make a polystyrene glue.

All of the above are dangerous in high concentrations without adequate ventilation, and may cause liver damage.

FUEL-AIR EXPLOSIONS

Although not typically a hazard in pyrotechnic compositions, this topic deserves some discussion.

Lampara shells enjoy a great popularity with the PGI membership, as do “fireballs” or “dust bombs”. There is nothing special about Cremora or any other artificial coffee creamer or calf milk substitute.

CHLORINE CHEMISTRY

The advent of ammonium perchlorate has made an improvement in the pyrotechnists ability to make beautiful colors and also strobe compositions. Chlorine is required in the flame for these colors, and in some cases is actually present as hydrogen chloride, which is a nasty corrosive because it forms hydrochloric acid in contact with water.

Many other “chlorine donor” chemicals decompose in this way also, including PVC, dechlorane, and HCB.

The soluble organic chlorine donors such as HCB, HCE and dechlorane should be treated as poisons!



Blue is Blue. Or is it?

by Tom Calderwood

After the last PGI convention, I posted a number of pictures I took of the event and put the link on the PML. One of the things that ensued was a discussion on the list about the quality of the blue in some of my pictures. "That's an incredible shade of blue. Is that real?" "I don't remember that blue being so blue – it was more teal." And I laughed. (Why? Read on.) I tried to explain that I did not 'boost' the colors (at least not by over-saturation) but I did try to make the pictures "pop" and not to try and create unreal colors.

One of the continuing questions was "Are those pictures real or did you Photoshop them?" Short answer: "I monkey'd with them." That's how the end of the story goes. If you don't want to read on, no worries. The following may get a technical and a wee bit philosophical, but I think it's an interesting topic so I ask you to follow me on this.

To address the question of "Is this picture real?", we need to address a major assumption that the picture right out of the camera is a 'real' picture. If you touch it with any kind of software then it isn't real any longer. But – how did the camera get the picture? Digital cameras will give you some kind of JPG image. Some cameras (and all pro-level cameras) will also give you a RAW image. A RAW image is just that – the picture without anything applied to it. For a camera to give you a JPG image, it actually *starts* with a RAW image! It applies a white balance, sets certain exposure parameters and does a sharpening task. It then compresses the image and writes it to the card. So – an image that is assumed to be real has had a number of tasks already applied to it. (One of the reasons why some cameras takes their time taking pictures.) So a picture straight out of a camera has had a number of monkeying tricks already applied to it.

I love taking pictures. I *really* love taking pictures. It's become something more than just a hobby for me. And it's not the equipment that counts – it's the picture. The final image is my goal. I now shoot in the RAW format with my camera to get the best possible picture. But shooting RAW brings with it a very particular problem (or "opportunity" of you're in management). It leaves the entire process of applying all the tasks normally associated by the camera to the user. The only job the camera did was to expose the image and write it straight to the card. Think of it this way: The JPG image is as if you took your film to a One-Hour Processing place and shooting RAW is if you had your own dark room. My dark room is Adobe Lightroom and Photoshop.

So which way is more "real"? Raw or JPG? Really, the answer is "Neither." Both have been processed. The better question is "Which one shows more of what I remember?" That answer is "It depends". But the question I *always* ask myself is "Does the picture look good?" A well developed picture won't look over-worked and should (mostly) reflect what we remember seeing, except for pictures intended to be modified as 'art'.

Still with me? Good – so let's discuss blue. You'll see where I'm going in a bit. You and I see with a combination of our eyes, nerves, and brain. Our eyes use a chemical process to trigger the nerves to let the brain interpret certain signals as color and shapes. Our eyes has a refresh rate of roughly 30 times a second. Our eyes will adjust the iris to control the amount of light coming into the eyes, but our eyes will also compensate chemically depending on the ambient conditions. (That's why we squint and squirm when we come out of the theater after a matinee, or why we have to wait for our "night eyes" when we go outside at night.) It's also why we can see an 'after image' of a shell by closing our eyes after it is done. Our daytime vision differs from our nighttime vision. Cameras do this by adjusting the "ISO" rating (how sensitive a sensor is). At night, we got our night eyes on, but on my camera I set it as if it had its day eyes. Add to this that when I expose for a fireworks picture, I hold the shutter open for many seconds – not 1/30th of a second. Just by how I take pictures differs from how our eyes sees an image.

Now on to some pyro. There was no discussion on list about the color red, yellow, green, purple, etc, only blue. But of all the colors, a good blue has the tendency to burn the coolest – and the dimmest. Besides white, red is very hot. Red is actually so hot that it may look like a streak of white with a red aura around it on the picture. If you try to get the red under control, the blue may not come out at all. Try to bring the blue out, and the red blows out to white. Trying to get the two on one picture can be very tricky. Our eyes don't necessarily see this – our brain does all this. But the camera has a tougher time. If you try to set the camera on Auto then it will probably try and overexpose for the night time and all the colors will be blown out. Our eyes do just great in their native 'auto' mode. This is important, since the camera "sees" blue differently than our eyes.

Blue is Blue. Or is it? (continued)

by Tom Calderwood

I photograph fireworks in a particular style so that when I go to develop it, the job is mostly done. But since I shoot raw, (and yeah, sometimes jpg) I still need to 'develop' the picture. The first thing I do is to adjust the white balance. Our eyes/brain adjusts very well to what we interpret as white, even though the light can vary widely in available colors. The camera isn't there yet, so we have to tell the camera what 'white' is. Cameras can also automatically adjust the white balance but with fireworks, that can lead to changes from picture to picture. This is important again because the quality of the color can change in the camera from what we interpreted it with our eyes.

The next thing I do is to adjust the amount of 'black'. This can be important with skies that are light polluted. This will also affect colors – especially 'cool' colors like blue.

The next step I perform is something that Adobe calls "fill light" – boosting poorly lit areas into a range that can be seen on a monitor or on print. Dim objects are the first to be influenced, so blue can be greatly affected.

Only then do I look at 'boosting' the colors (but as said before, *not* using Saturation). Most of the time the picture doesn't need this step – it's already about as colorful as it will go without looking like a piñata.

All these variables come together when we optically observe a bright, flaming object flung across a (hopefully) black sky and try to digitally reproduce a reasonable reproduction of it. And I'll submit that because of all the differences between the two mediums, they won't be the same. That leaves to me to produce the best looking picture possible – and that means getting a blue that I *wish* I could see. All in all, I'm not creating a blue that is not there. I'm just trying to bring it out.

Is it right or wrong? Real or fake? I'll leave that to you. And ain't I a stinker? I lead you through this diatribe on *my* philosophy and *my* methods of working on pictures and I then weasel out to leave *you* to determine if I'm doing it right or wrong. That's because I'd rather produce a picture where the night is blacker, the dim areas are brighter, the colors pop– and you are enticed to simply buy the freakin print. I laugh because while folks talk about the blue, they don't talk about all the other pieces to the picture. Does that mean I'm overdoing the colors? Nah. I like'em that way. And to me, that's what counts.



*This is a JPG image, right out of the camera. It is a **very** respectable picture and can probably go straight to film. However, I don't like how some of the crossettes kind of disappears, as well as the reds at ground level kind of overtake everything. This needs to be 'calmed down' since it attracts the eye first.*



In this image, I made some adjustments so the crossettes can now be seen. The red, being hot, was hard to control, so I "recovered" as much as I could (constrain the brights). I also increased the saturation of the image by increasing the amount of black. There was no color adjustment aside from the white balance (which was very close to the JPG). Of all the colors, the blue showed the greatest effect.

WinterBlast XXI—"The Sky's The Limit"

by Lynden King, WWB XXI Chairman

Get ready for a fabulous time at Winter Blast XXI, "The Sky's the Limit", in Lake Havasu City, Arizona.

For the first time this year, all the way from Jamieson, Oregon, Homeland Fireworks will be providing the Public Display on Saturday Night.

As usual, we are looking for interested pyros, groups of pyros and companies to put on their own shows and demos for our entertainment. Interested parties should contact Kief Adler at 818-383-7755 or kief@sbcglobal.net as once again, he is our resident Demo Chair. If there is any interest in having a member's shell building showcase contact Kief for this also so we can put it in the schedule.

We are looking forward to another great year of seminars. Once again, Richard Haase will be teaching the proper and safe techniques in building aerial shells in "Shell building 101." If you have ideas for a Seminar you'd like to see or are interested in giving a seminar, contact the Winter Blast seminar chairman, Steve Wilson, at firefun@comcast.net

The Trade Show will be at Sara Park again this year, so everyone come out and check out the great products offered by the vendors.

You can purchase "Class-B" product under the club's ATF license. Their will be a list of vendor's with a pricing list up on the WPA website soon. Find your favorite vendor, go to their web site to check out their products and get your orders in soon. There will be nobody on site selling "Class-B" product – it will be presales only. We have enlarged the "B" firing area with more equipment than in the past years so we can keep the sky full of fireworks.

We are also going to have a MILLION FIRECRACKER BURN, that's right, over a million firecrackers, all going up in one continuous roar. We are going to need member and sponsor contributions. The privilege to light this baby off will be awarded by a raffle. So if you want to go down in WPA history as the person who lit the MILLION FIRECRACKER BURN OF 2010, then buy lots of those raffle tickets. The more you buy the better chance you have of winning!

The fun doesn't stop when the festivities at Sara Park shut down. Don't miss this years Afterglow parties at the Quality Inn, the host hotel. Don't pass on the FREE beer, soda and snacks, all beginning at 10:00 p.m. each night.

Mark your calendars for Winter Blast XXI Feb. 11-14, 2010 and ask for the time off NOW. If the price of gas is holding you back we can help get you a ride with someone: call me at 916-686-5054 e-mail at skyking@elkgrove.net, or contact you area Vice President and we can find a way to help get you there.

LYNDEN KING
WWB Chairman



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Thank you ALL for your continued support of the WPA!

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 is reliant on our corporate members continued support for the health of our club. Do us ALL a favor and their services.

When we say "Thank You", it is not a meaningless phrase. We really mean it.

A Note About the Cover

by Tom Calderwood

Fireworks ain't just for 4th of July, high school homecoming games, or concerts. This year there was quite a bit of fireworks shot around the holidays. One of the events was the annual Manhattan Beach Pier show put on by Raven Marquez. John Noonan helps out in choreography, as well as Raven's Flying Monkeys Pyro Crew. This year, it was on December 13th. The water and pier at the bottom of the picture is from one of the images (collection can be seen on this link). I also included images from the last WWB and other pyro events.

I also want to send a special note to Jeff Pardee in alerting me to a couple of other holiday pyro shows. One had it's debut this year on the Balboa Pier (California) closing out this year's Newport Christmas Boat Parade, and New Year's at the Queen Mary. Both of these events were kind of tough from a photographer's point of view, but they still worked.

If you have a pyro show coming up, drop me a note. I'd love to 'shoot' it!

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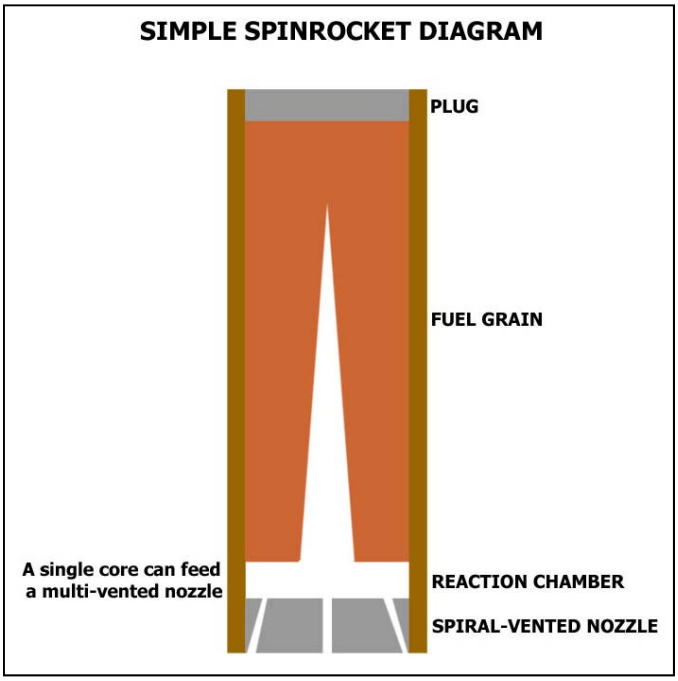
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Flight of the Twizzler, Part 2: The Spin Rocket

By Bob Forward

Although it was fun to use the spiral-shaped Red Vines candy to form the nozzle of a spin-stabilized rocket (see previous issue) the casting process was somewhat difficult and the spiraled grooves in the nozzle only gave a weak twist to the rocket.



After some further experimentation, it was finally decided to create a rocket with angled vents at the outer edge of the nozzle, thus giving them more "leverage" to impart spin.

For a while, the assumption that this would require multiple cores in the fuel grain made the idea seem unworkable. But then it was realized that this was not, in fact, necessary.

By giving the nozzle a slight distance from the grain, a "reaction chamber" is thus formed, allowing a single core to feed its exhaust gasses to not only the main nozzle but the three angled spin-nozzles as well.

Although it was fun to use the spiral-shaped Red Vines candy to form the nozzle of a spin-stabilized rocket (see previous issue) the casting process was somewhat difficult and the spiraled grooves in the nozzle only gave a weak twist to the rocket.

SOURBALL XY ROCKET PROPELLANT

(Grind	Potassium Nitrate – 54	Xylitol –27	the
KNO3	Ascorbic Acid (Vitamin C powder) – 8	Sulfur – 7	and iron
oxide to-	Iron Oxide, red – 4	Total – 100	gether,

then grind the other ingredients together, then mix.) The fuel must be melted and cast to burn properly; this video shows the difference between the milled powder and a lump of melt.



http://www.vimeo.com/8589205



Casting the grain is simplicity itself: the rocket fuel is melted in a crock pot (outside, please!) and stirred well, then the melted mass is poured out onto a sheet of wax paper or a non-stick pan. You should have a sufficiency of tubes, plugged at one end, standing by, along with a dowel for tamping. The dowel does not need to fit tightly – in fact, it is better that it does not.

The cooling fuel will remain malleable like putty for some time, de-

Flight of the Twizzler, Part 2: The Spin Rocket (continued)

By Bob Forward

pending on the ambient temperature, and can easily be handled with bare hands.



Roll a series of balls with the fuel, slightly smaller than the tube inside diameter.





Drop them into the plugged tubes and tamp with the dowel, stopping when the fuel reaches within one inch of the open end.





Using a lightly greased tool such as a large nail or Philips-head screwdriver, poke down into the fuel and give the tool a couple of turns to form a more-or-less cone-shaped core. Repeat with all the filled tubes. Then just set them aside to cool and harden.



The nozzles themselves are cast from a mixture of resin and sand. To make the mold (which is endlessly re-useable) a slab of PVC plastic (these pieces were in the remnants bin of a plastic materials store nearby) is drilled with a spade drill that matches the ID of the rocket tubes. The resulting hole should be about 1/2" deep, and with luck the pointed guide of the spade drill will emerge from the other side – but only the point. This gives you your center hole.



It is important to have obtained some cocktail "sippy straws" from your local bar or fast-food joint. I personally use the thin black straws available at Carl's Jr. for coffee stirrers. They are approximately 1/8" in diameter. Use a drill bit that matches the straws' outer diameter to drill three angled holes around the center hole in your mold. The holes should pass completely through the mold. All the vent holes should be angled the same direction, naturally!



Ideally you should use a guide and a jig to make the holes perfect. I confess I simply eyeballed these at the time, but they seem to work quite well anyway.

Cut the sippy-straws into lengths about 1-1/2" long – the length is not important, just so they are long enough to be grasped and pulled out after the casting is complete. By cutting them at an angle you will find them much easier to insert into the holes you have drilled. A single drop of hotglue in the center hole with a straw sticking upward from it will form the main nozzle.



Fiberglas resin mixed with sand and a good squirt of hardener is then whipped up in a paper cup. You don't need much. It should be just thick enough swith sand so that it will barely pour – a consistency similar to Cream of Wheat is about right. Pour it into the molds. Fiberglas resin will not stick to PVC nor to the straws, so no greasing is needed and the mold may be red over and over.



Once the cast nozzles have hardened (about an hour) the straws can be tugged free, leaving the vent holes and nozzle. The nozzle itself can be removed from the mold by tapping on the back (if you are lucky) or by inserting a small Philips-head screwdriver in the underside center hole and pushing.



Flight of the Twizzler, Part 2: The Spin Rocket (continued)

By Bob Forward





A bit of epoxy and a few bangs with a mallet will seat them firmly inside the rocket tubes you have made. Keep them flush with the ends and make sure the vents are not blocked by any of the epoxy. There should be a slight gap between the fuel grain and the nozzle – this is your "reaction chamber" which allows the single core fuel grain to vent through all the nozzle holes.





Headers, if desired, should be no wider in diameter than the rocket itself to prevent spinning problems. A hole can be drilled through the plug as a passfire.

The launch tube should be only slightly larger than the rocket itself, and long enough to ensure the rocket spin is up to speed before it leaves the tube. I personally fire mine electrically, using a home-made strip-and-dip ematch small enough to fit through the holes (Subject of a possible future article!)









The accompanying video shows several of these in flight.

http://www.vimeo.com/8069414

Nozzle erosion from a recovered rocket is seen to be significant but acceptable.

These are very simple to make, and if you have several molds and make your nozzles in advance during the Southern California fire se ason (when you can't do much else anyway) you can have a good supply on hand for when making and launching rockets is safe again. (Such as at Winterblast or Do-It!)

Additionally, if you watch the video you will see that I added some Ti fines to the Sourball fuel – since you are not using rammers and tooling, there is nothing to get scratched up, and it does give a very pretty tail – spread wide, like a ballerina, from the angled holes spinning around. Enjoy!



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A Tour of Chinese Firework Factories

This is part 2 of 4 on 9+ firework factories toured in Liuyang China

by Peter Shoewe

THE UNION FIREWORKS FACTORY

It was Tuesday morning and the Olympics were still a few weeks away. I had 5 hours of sleep at most and was woken up a number of times by my coughing for half an hour at a time. I decided to try the breakfast for 25RMB for guest & 40RMB for non guests. They walked me to a corner table facing away from everyone else. Next to my table I noticed a Caucasian man with 5 Chinese men in their early 20s. Should I have seen what they were about? Yes I should have, but didn't. I felt let down. I never ate with 5 Chinese firework reps at breakfast. I always ate alone this time of day. Hostess?! Where are my Reps?! At the Buffett everything was Chinese except for Fruit Loops & Kellogg's cereal with milk. They also made omelets and I skipped the 1000 year old eggs, they looked too old. The toast didn't taste good and that wasn't corn on the cob I had, that was rubber on the cob. They cooked that corn in sugar water for about 3.5 days too long. After breakfast I waited out front for my ride.

A lady in her 40s picked me up in what looked like a personal van and we drove to the Union fireworks office.



Union Fireworks Entrance

Here she got out and a 20 year old lady and male driver got in. We drove only 5 minutes to the North-West edge of town to a large cake making factory. It was clean and



Union Fireworks Office

modern looking. A sign at the entrance said "Union Fireworks". It was built along a hill with farms around and a view of the town. There was a 2 acre pond just past the entrance on my right with a modern looking 2 story office building on the left. I was glad my lady guide was patient and not rushing me. We walked into the office to tell the plant manager we were here while I walk into their factory show room. Every factory had a show room and another show room at the office in town. This one had 4 rows of 3 shelves of many products they've made in the past 10 years. It was clean & orderly. Outside we walked a short distance and made a left up a steep driveway. In these buildings they made the tubes for the cakes. Every time a women worker saw my video camera they smiled and talked about it. At all factories I noticed there were always 2 people working at the tube rolling machines. This could be a woman and a man or 2 women. They were usually from 20-40 years old. A stack of Kraft paper was laid



Paper Storage Room

out on the table in front of the tube roller, but spread out so that 3cm of paper end was exposed. A lady worker took a paint brush, other times a paint roller and rolled this 3cm of paper with a clear glue they made at the factory. A 50 litter aluminum round pot sat on the floor filled with glue. A second worker, sitting on a stool behind the roller, pulled up a piece of paper about a 135cm wide by 50cm long, rolled it around the bar a few turns, then lowered a second bar down on top of the first with a handle that started the roller spinning. In a few seconds the sheet of Kraft was rolled up. The inner part of the tube had the 20cm of glue while the out part only 3cm. A cutting bar was lowered with circular discs that cut the tube into whatever length they wanted. Then they were pushed off by hand into a basket on the floor when another sheet was pulled on and rolled up. These rooms would have 1 to 6 tube rolling machines. From here another worker bundled 61 tubes with some red plastic twine, put them on a cart and took them out to dry for no more than a day in the hot sun. This is why production slows down during the rainy season as everything must dry indoors with far less room and it takes longer.



Pounding in Clay End Plugs

The men who worked in the clay plug room would get a cart full of finished tubes. These were smaller buildings at about 6m by 10m. It had a corrugated galvanized pitched roof at 4m high in the center. Many times the windows had no glass in them. Men 50-70 years old pounded in the clay. Some of them wore cheap paper masks over their nose & mouths, the same we can buy in the US, but most did not. 4 to 5 men in each of these buildings stood behind a strong wood table against 3 of the walls. Some factories used only one kind of clay, others used 2 different types. The clay had a distinct orange color to it and when used in pairs the other clay looked tan. The orange clay was powdery while the tan one had more grit. I noticed a hydraulic press just outside under a roof with no front wall between these 2 clay end plug buildings. The



Hydraulic Press

press had 61 steel rods for pressing clay into tubes, but no one was using it. They hammered the clay by hand with a wood cylinder and 4" head hammer, and used an aluminum clay scoop with 4 scoops on it, doing 4 tubes at once that sat up on a small rack. There was lots of clay dust in

A Tour of Chinese Firework Factories—continued
by Peter Shoewe

the air. There were 10 liters of clay piled on the table. After putting some clay into the tube, they would then drop a wood spindle in the first tube and give it only 2 whacks, then move on to the next tube. The tubes are taken off and laid on the table. When they have enough tubes they bundle about 61 of them together with an orange plastic twine and stack them in the middle of the room. They start work around 7am and quit around 5 to 7pm depending on how busy they get. They are paid by what they produce, not by the hour. Big stacks of finished tubes behind them take up most of the room 2m high. From here the tubes get taken to the next building on a 1.5m long wood cart.

I visited 5 to 6 of these assembly buildings. Each had up



Assembly Buildings with Emergency Water Supply

to 12 tables against the wall where mostly women aged 20 -45 would line up 5 or more tubes side by side, tape them together both sides, punch a small hole near the bottom with an ice pick with a metal stopper a centimeter from the tip to keep it from going all the way through. Then they put 2 fuses in, a visco & paper, fusing all the tubes together in the order the customer wanted. One row after another was stacked up until the size of the cake was done. Then a plan Kraft paper quickly glued around this and it was set aside. From here a woman came from the next building and carted them away.

In this building they dropped inserts in each tube. The inserts were already made in the small buildings 50m behind the hills. No one but workers was allowed into this area. After the inserts, they used a wood dowel and pushed down a cardboard disk to keep the inserts from falling out, and then a final ignition fuse taped on. From here the cakes were taken to a temporary storage building and stacked up so there wouldn't be a back log of cakes in the work room. Then they were carted to the finishing building where labels were glued on, put into shipping cartons and carted to the shipping building which was about 35m long by15m wide. Here they waited for a semi truck to take them to the nearest port, which kept getting further away when ever another one was closed to fireworks. I saw different languages printed on the cartons. Russia was one, as they allow fireworks there since around 2002, but their class 1.4G is closer to our Class 1.3G. (Since the night club fire in the city of Perm in Dec '09, Russia has banned fireworks in public venues.)

I walked past a large cement area where 100s of bundles of cake tubes were drying in the hot sun. Everything I saw at the Union Factories was clean. Quarter acre ponds between the buildings are used to put out fires with. There were very well groomed fruit trees between buildings with bushes and green grass. It was all very neat looking .



One Phase of Snap-It's Assembly

After 20 minutes we drove to their next factory.



Gluing on Fountain labels

This was just the next street over, 5 minutes away. More cake and some shell making. My 20 year old translator said they get paid 30 to 70RMB a day. They have another factory where they make shells, fuses & firecrackers, but this one was about 2 hours away and we weren't going there. Each factory had about 300 workers and had the same layout. An accordion like gate, one office building (in addition to their office in town), a large building of boxes ready for shipment, then assembly buildings where paper tubes were made, inserts are put into cakes, rockets, shells 3" and smaller assembled and pasted. The next set of buildings are the smaller 3x6m size made of all cement with no front wall, no electricity and a cement wall down the middle. I only saw a thick rubber mat on the floor and table for anti-static at some of the factories. This is usually where shells 4"+ are assembled. Beyond this area are the same sized buildings for star mixers, star pressing, where inserts are made and chemicals mixed. Then in a very remote spot are up to 3 buildings where bags of chemicals are stored and few employees have access to. There were 4 ways I've seen Chinese make fireworks and that's fast, faster & fastest. What takes us 3 days to do as a hobby they do in an hour. They don't have time to waist since they get paid by the job. Everything is done in an assembly line fashion. And did I tell you the Chinese make fireworks really fast? They definitely don't do it our way. They wouldn't make any money if they did and I was told by many that the profit margin is razor thin. From here we went to the print shop.



Ready for Delivery!

THE PRINT SHOP

The print shop was off in an ally at the edge of downtown Liuyang, only a few blocks from the office. Here labels were made for all their customers products. Downstairs were the presses where 2 men in their 50s worked which smelled very heavy of ink. Upstairs had filing cabinets with many files of large clear plastic sheets. The sheets were about 30x 60cm in size with black ink on them, sometimes colored ink, in the designs of the labels. About 4 men at work at tables designing the next labels. From here we drove to the office. I find out the office is on the 2 floor. The other 3 floors were other companies most not related to fireworks. This is also where the fireworks market area is. An entire city block with small stores. Those stores sold the equipment to the factories or anyone who wanted to buy them. Upstairs about 10 men and women working behind desks, clean, modern and air-conditioned. The first woman who picked me up took me into a large room with a large wood desk in the center, fruit on a table cut up on serving plates and hot tea in a tall clear glass. I could do without hot in this hot weather, I only wanted cold. I drank some and ate some fruit. I asked for their catalogs including the one for

A Tour of Chinese Firework Factories—continued

by Peter Shoewe



Plastic Fireworks Label

Europe, she gave them to me. Union Fireworks has a minimum order of 50 cases per item & one shipping container full. She too says they no longer give out price quotes, only on the day you buy. The 2 younger guides waited for me in the main lobby and took me back to the hotel. It was noon.

www.Fireworks-Union.com This is the companies official site although it has been down lately. www.Fireworkstown.com Fireworks news & info

THE FLYING EAGEL FIREWORKS COMPANY
Makers of CANON & WOLF brand

They'll also custom make products.

Keep in mind that firework labels can be made by more than one company. When the factory can't produce all you want or in the time you need them then it's better to work with many companies. National fireworks also made Canon brand and most likely still does.

At 1 o'clock, a rep. came from Flying Eagle fireworks. He picked me up with a driver in a black, new Japanese car with very dark tinted windows. We drove 30 minutes south. The driver drove fast and hard, around pot holes a meter wide and 50cm deep. I find out that all roads are well kept except for the roads that lead south. We drove into oncoming traffic while they drove on our side to avoid their pot holes, swerving back and forth while trying to avoid getting hit by others, swearing our way. Once a day, cars passed us on both sides as we drove in between at 60KM. We drove through the town of Jin Gang. There were many small shops selling papers for tube rolling to the factories as well as paper shell halves. Tom knows of PGI. He was invited twice and the government denied his visa both times.



Flying Eagle Main Entrance

At the factory there was another chrome, shiny folding gate that rolled open for us with a security guard in a booth. The factory has nicely trimmed bushes inside as most did. I'm taken upstairs for a bit while we wait for someone, then we drove further back past the fruit trees between the assembly buildings 30m long by 15m wide. The Flying Eagle factory is 900 Moos - that's over 200 acres. He says there are 500 people working here now, but 800 in peak time. Most buyers come in September and October, but a lot are visiting now because of the 2 month shut down. Beihi is the only port they can ship out of this time because of the Olympics, and only shells 6 inches and smaller since 2002. They made all sorts of items like fountains, rockets, shells, roman candles 1.3 and 1.4G. The buildings at the end are where the firecracker strings were assembled from 180mg to 3 grams. Today they were making some for Thailand and the Chinese market. Some rolls were 3 gram crackers only, several meters long. A worker would take a hand full of crackers from a pile, put them on an aluminum tray, then used a foot pedal to spin a sewing machine to thread the fusses together. Tom tells me that when the string is tight



Fuse Sewing Machine

it's done by hand, but when the cracker string is loose it's done by these hand assisted machines. Stacks of rolled red crackers sat on the tables with 12 workers in each of these buildings. The women who made the small packs of 16 where paid the most, as this is the most tedious of work. The driver stayed in the air conditioned car following us at walking speed as we went from building to building.



Fountain Assembly Room

There was another manager with us as well.

In the cake making building, like other factories, 2 holes are punched with an ice pick like tool with flat metal stopper. 10 to 20 tubes are laid side by side. Up to 15 women work in each building. There was only one man putting together cakes, all the rest were women between 30-45 years old. Most the women wore dresses, a few in shorts. There was lots of dust floating in the air in these buildings with windows on both sides, none with glass. In one building there were 1.5 inches Class-C shells being made. Colored string was attached to the shell to identify what was inside. Every time the women saw me videotaping them, they giggled and said something to each other. Round wicker trays with up to 150 1.5" shells were drying in the sun. I asked to see the firecracker making area, but I wouldn't be allowed that far back.



We walked to some small 3x3m buildings, some were larger. These where for cutting paper fuses. No one was here this time of day. Our guide said it was too hot to work, increasing the risk of a spark. Rolls of paper fuse are kept on one side of the cement wall behind the building in their own small closet sized room. Each fuse went through its own small hole in the wall & toward the fuse cutter. The worker sat in front of the cutting tool, and by turning a handle it would advance and cut up to 12 fuses at once at a pre-adjusted length.

I wasn't allowed into the star mixing area. Chemicals are mixed between 4 & 7 am, depending on the temperature. We walked back and in the distance I saw about 100 bags of something the size of 80lbs cement bags, staked 10 high. The building was also made of cement, 6m square with no wall on front and some glassless windows in the back with a 2.5m high corrugated steel roof. I asked what was inside. "It is the chemical we use for the firecrackers." "Do you still need to mix this further?" "No it's mixed and ready to use now." "Where do you mix this?" "In the small town we past coming here. Then they put it on a truck and bring it here." In other words it was flash powder, mixed and bought by an outside contractor. A small

A Tour of Chinese Firework Factories—continued

by Peter Shoewe



Flash Powder Storage

wood cart was nearby to take the bags further back to be used in firecrackers.

We walked into a variety pack building. Here there were 8 men and 8 women. Some worked at a conveyor belt, others staked boxes. Only one belt was used today, the



Variety Assembly and Shrink Wrap

other 2 stood idle. Cellophane was put around a box then onto the belt and into a heating box that shrunk the plastic. On the other side 2 men picked up the box and staked them nearby 2m high. The men looked at me with no expression, almost as if they may walk over and make me stop videotaping them. The women would look up for only a second. From here, we walked to the storage building full of boxes ready for shipment then drove back to the office.

There were four streams of sweat pouring off my face at all times unless I was in an air -conditioned car or office. Four seemed to be the mandatory minimum for China. My shirt was half wet front & back, but never theirs. I always had a bottle of water with me & they gave me one when I first got into their car. We walked upstairs and into the factory show room. There is a large wood conference table in the middle surrounded with office chairs & windows with a view across the street to 2 story buildings



1.5" Shells Drying in the Sun

that could have been apartments. This room was clean and orderly. There are shelves from floor to ceiling of all their products around the room, both Cannon and Wolf Brand. I asked to see some salutes. Someone brought out 5 sample boxes and put them on the table. These were for Singapore and other countries. Here they made 1,2,3,5 and 10 gram crackers. This seemed to be the standard sizes. The ones in front of me were 3 & 5 grams. I noticed some very nice looking Christmas crackers for Europe. The wrappers looked so good in white and gold I would-

n't want to use them. After 10 minutes we drove to the office in town.

On the way I find out that chemicals are bought from 4 different provinces. The office is a few blocks North of the Liuyang River. There are 2 men working behind desks in their 60s. I'm taken into the showroom. Here it was dusty, and we sat at a large wood table. The minimum order is one 40 foot long shipping container with a weight limit. So you have to order a lighter product if you ordered something heavy like firecrackers, it could only fill up half the container. Any more and it would be too heavy. "One container would cost $20,000-$50,000 depending on what you ordered plus shipping of $6,500, but that will go up to $7,000 very soon." They sell a case of firecrackers 16/80/12 for $14 U.S. I wanted to hear it in RMB. 200 cracker packs were 2.15 RMB each or 0.32 cents it sounded like and there is a 50 case minimum per item. After 10 minutes here I'm taken to my hotel. On the way I asked about apartments.

Apartments in Liuyang go for $150-$600 a month US and they have power failures in this town 3 to 4 days a month. This winter it snowed heavy with a meter of snow. It snows here in winter time about 2cm. But this is



New Condo Construction

the most in 20 years and power lines went down because of the ice on them. Hotels had back-up generators, many had no heating. Another day a rep told me "In the summertime you can tell when there's a power failure, since everybody walks around like a Zombie by not having had any sleep without air-condition." Many apartments and condos do not have balconies.



Hotel Restaurant

DINNER

An hour later I had dinner with Tom. We ate at my hotel restaurant. I find out that in the US we're more brand oriented then they are in Europe. Tom, like most firework sales people, got a degree in international marketing. He came to Liuyang for no particular reason and applied with Flying Eagle (as they were known in Liuyang). He didn't know if they needed someone or not. It just happened they did. He said he bought a new apartment for $50,000, US, but there's nothing in it. No toilet, no kitchen sink, no countertops, no carpet, nothing. I was told this is common for many parts of China. It cost him another $10,000 US to get it livable and he can rent it out for up to 2,000 RMB a month, $300US. 1,700 RMB per meter and now its worth 2,100 RMB per meter is how they sell it as. His condo is near the Yuan Tian Hotel. Lots of new 20 story high rises being built along the river. There was almost nothing on this side a few years ago. We talked about what's legal in Liuyang.

I'm told fireworks are illegal in Liuyang. Although you can buy many types from the stores in the firework supply market area, if the police catch you lighting them they'll fine you except during the holidays, religious

A Tour of Chinese Firework Factories—continued

by Peter Shoewe

events, or at weddings. And shells are illegal for all Chinese everywhere, only display operators are allowed to handle and shoot these. Chinese like big fireworks and they can get 3" shells in the form of cakes and single shot tubes. After dinner Tom left. I had eaten too much, but it tasted great.

There were a lot of late model, black cars with black tinted windows accumulating in the parking lot area and they all had drivers. A hotel employee said "it's a high school reunion." All the people were in their 50s. On the news they said the UV index is very high in Shanghai, and a lot of rain in the quake effected area. 3" shells were being lit off only a kilometer from my window as they did every night at 9. The BBC not only talked about world events, but also news for the local area. They say it's unusually hot & dry here in Hunan and central China. Normally there was more rain this time of year. My coughing and sore throat got worse. I took my tape recorder and walked outside to record the weird bug sounds. Over the next 2 days I would see Simba Fireworks, a new factory under construction, Asian-Swan Fireworks, paper ball shell making and the fireworks supply market area. www.sinofef.com This is Flying Eagles official site also called Triton Fireworks.



Flying Eagle Fireworks Assembly Building



Union Fireworks: Clay Scooper



Flying Eagle Fountain Assembly



Flying Eagle Show Room



Union Fireworks Plastic Melt Press—24 pc Sparklers



Flying Eagle 3 to 5 Gram Crackers

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