

Western Pyrotechnic Association Newsletter

Summer 2014, Vol 25-1



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Cover Picture - "BANG! BANG!"
Photo by Kelly Dreller

Elected Officers of the WPA

President:	Steve Wilson
Vice President:	Greg Dandurand
VP Publications:	Pete Hand
Treasurer:	Richard Haase
Secretary:	Dennis Miele

THE SMALL PRINT

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.

WPA CORPORATE MEMBERS

Pyro Novelties, Inc

Flying Phoenix Corp

Cobra Firing Systems, LLC

Combined Specialties

Holatron Systems, LLC

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.



Letter from the WPA President

Some 26 years ago a much younger and energetic version of myself got to wondering why we didn't have a formal fireworks organization in the west. The PGI was in full swing and had members from all over the place, but their conventions catered primarily to our pyro brothers east of Winnemucca and beyond. So with my handy Commodore 128 (no 64K of RAM for me!) I started writing letters to guys like Jack Drewes of AFN, Ken Kosanke and Bob Winokur picking their brain about how to start such an organization. It didn't take long before a few of the most committed fire bugs on the west coast found me and we started having meetings. This led to some very crude newsletters and eventually our first convention in Mesquite Nevada with a whopping 126 attendees.

Back in those days we had a high percentage of shell and rocket builders in our group. The atmosphere of regulations was a bit more relaxed so an amazing amount of home made material came to our conventions. As a group we had a fairly uniform interest focus and for the most part, followed the PGI's model for a lot of our activities.

Over the years the WPA has seen a great deal of growth, and some shrinking at times. We have had times of great prosperity and times when we fell below the critical mass of leadership, often because a particular member or faction overstepped their bounds and pissed just a few too many members off. In the last few years we seemed to have stabilized on a consistent membership size, and our annual events have become pretty routine, albeit still exciting.

I have toyed with the idea of being an officer again from time to time over the years, but to be honest, we've had a lot of good leadership on deck throughout this decade - no reason to fix something that isn't broke. Coming into WWB25 I had no real inclination to run for office until Saturday evening, and a few beers while at the Fireworks America BBQ out in the parking lot, then one prominent member, then another talked me into it, so here I am. I do apologize for not being able to stay at the business meeting on Sunday to speak a bit and be present for my nomination, but duty called back at the site promptly at noon when the highest profile seminar that I had booked was about to start.

It would be an understatement to say that I am proud of what the WPA has become over the years. Being on staff often heading our seminar program, I have attended many of the 3 PM staff meetings at the Blast and I am literally blown away at the breadth and level

of commitment of those who take on all the tasks required to run our conventions. Being around all these folks, in matching grey embroidered polo shirts equipped with radios ready to take on an evening of controlled pandemonium, is pretty impressive.

The current board of directors is an amazing group to be part of. We have all arrived here with no specific agenda except to serve the WPA as best we can given what we inherited and to improve what we can from there. Each of your officers carries some unique skills and level of experience that cumulatively seems to work very well together. As of this writing we've had 5 conference calls, each at least 2 hours in length. There seem to be no shortage of topics we need to cover and we are working diligently already at getting the business of the WPA done as well as planning our next few events.

One thing that I do find odd is that although I was a founding officer of these group many years ago, there is no distant, strange deja vu about serving the WPA again. We are a different group then we were 26 years ago. Back then there were a few members who pressed certain agendas and often our meetings had an underlining tension behind them. That simply isn't the case today, thank goodness! All of your officers understand that we represent a large group of diverse members with a lot of different backgrounds and interest. Some of you are very vocal, and others we rarely hear from. But we know that in making decisions, we need to take in the entire group and not just few. A recent discussion about the use of Camp Kirby is a good example of this principle.

I'd like to thank all those who have taken on the chore of running this club in the recent past, Lynden King, Pete Wood, Kief Adler, Kathy, Ann and many more have helped bring us to where we are now. They have established their own legacy (especially Lynden) and it makes me proud that I can try to follow in their shoes and try to lead this unlikely group of fire fanatics for 2 more years.

Before finishing here, I can't go without saying how deeply saddened I am by the tragic loss of Randy Feldman this year. Randy had contacted me several times prior to the convention and was pretty pumped up about the two seminars he and brother Michael were to give - they were very prepared to give their all to you, ultimately Randy did. I'd also like thank Lynden and Richard Haase for their handling of the situation as it unfolded. There was also an incident Sunday night at the convention that had to be handled

discreetly which shall be covered elsewhere in this newsletter. Again, thanks to Richard for minimizing the windfall of that situation.

Another area of interest to me is the committee working our behalf to establish a location and relationship with the tribe at Moapa, NV. Although it has become clear that this is not a slam-dunk replacement location for Winter Blast anytime soon, the site has great potential for our manufacturing members as a place for them to incrementally experiment and build pyrotechnics year-round that can culminate in displays at the site as well as Hawthorne and SARA Park. Greg Adler and his committee are taking a very professional approach at this undertaking and I am very hopeful that it won't be too long before our more serious and responsible builders use this facility to further along their craft for all of us to see and benefit in.

Moving forward, I am very pleased to report that next years Winter Blast will see the return of Kurt Medlin as convention chairman, with Richard Haase as his co-chair. Not only is Kurt a founding member of the WPA and expert builder of shells and rockets, Kurt

brings with him a wonderfully organized method and great disposition. Kurt is currently pouring over all our recent convention documents and guidelines in readiness to put on probably one of the best organized WWB's yet.

Also joining the staff one more time is Richard Cole as vendor chairman. Richard has witnessed the dwindling amount of fireworks and chemical offerings in recent year and is committed to put that back on track. There will be a few other staff changes as we note those who are rising to the occasion and steer away from any situations that aren't working to their potential.

Our next WPA event is Do It in Hawthorne, Nevada. Your event chairpersons DJ Dutra and Joe Wright have been working on this for several months now and we will be going into full swing over the next few weeks getting you all the rest of the particulars. Watch the WPA mailing list and Website for updates and registering. Hope you can make it!

Steve Wilson
President

A Peep from the Veep

Greg Dandurand

Well WWB XXV is in the books. Things were not perfect, but the staff was on point and everything seemed to work out. As usual, I'd like to thank all the hardworking staff members and volunteers who made this event happen. It was a long week, but we all had a good time. I'd like to thank the Jackalopes for the burro races. I think that was the most fun I've had in a while. The new Board is working well with the rest of us and I know WWB XXVI will be fantastic. I hope to see you at Do-It.





Editor's Notes

Winter Blast 25, our Silver Anniversary. What a great occasion we had planned - how wonderful it was going to be! The Fates laughed at us. First it was the weather. Oh, we had it wonderful in Arizona, we went home sunburned, but most of the rest of the country was gripped by blizzards and freezing weather that brought it to a stand-still. Many flights were canceled and some of our seminar presenters couldn't make it, leaving holes in our spectacular program. Members had difficulty finding a hotel room. Sara Park built a racetrack in the manufacturing area. We worked around it. Kief Adler did a magnificent job with the hoteliers, and Bill Ryan somehow got everyone fitted in to the manufacturing area. It was looking good!

Then Randy Feldman had a tragic accident. He was seriously burned in a car fire in the City, and though he was flown by helicopter to one of the foremost burn centers in the country, they were unable to save his life. He died two weeks later. Your editor visited him several times in hospital and it made an impression on him that he'll never get over.

Friday night's show, by AM Pyro, went dark in the middle thanks to a failure in the firing system. As for Saturday night's show, by Pyro Spectaculars, I believe I can honestly say I've never seen its like. It was - spectacular. The trouble is, some of the shells didn't burst in the sky. One of them burst in the manufacturing area, resulting in a fire that cost Hunter Barrera a lot of money and had to be attended by the City fire service, causing a half hour break in the program.

We weren't done yet. Towards the end of the event, one of our members fired a rocket that went out of Sara Park and struck a spectator's RV. It penetrated the roof and exploded inside, causing considerable damage but fortunately no casualties. Meanwhile, at least two other rockets fell close to members of the public outside our area of the park, though again fortunately, neither caused damage or injury.

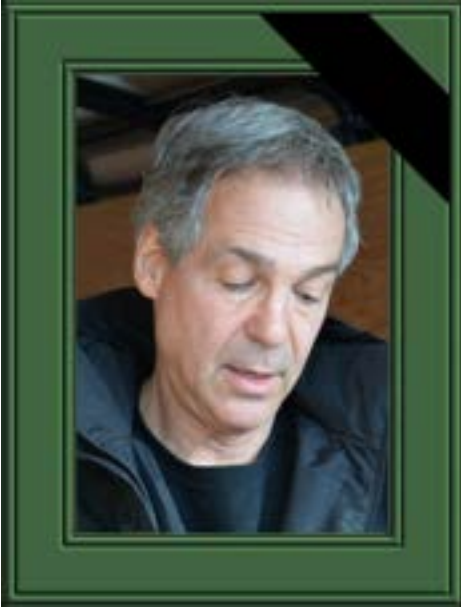
On the whole, though, it was a great Winter Blast, and for those not personally touched by unfortunate events, one of the best ever. So let's accentuate the positive. The fireworks were spectacular, and I'm happy to report that nobody was killed or maimed during the Burro Races, in spite of the participants' best efforts.

Someone who certainly enjoyed the heck out of WWB25 is our guest contributor, Kelly Dreler. Kelly is not a WPA member - she's a resident of Lake Havasu City who loves Winter Blast so much she took more than 300 photographs, some of which are featured in this newsletter. Consider the cover picture. Who would ever think a photo of *salutes* could look so good?

Elsewhere in this newsletter I've included a how-to article on manufacturing. We have a wide range of know-how amongst our members, from beginners to experts, so I hope some may find it useful, and others may critique my writing. I'd like to make this a regular feature, but I can't write it all, so I'll be looking for contributions (please). I'm taking suggestions on a name for this section. I received one from a member who shall remain nameless - I'm sorry, R____ H____, I don't think "High Three Club" conveys the right message.

Pete Hand

PASSAGES



RANDY FELDMAN



GEORGE BAUER



MATT DEL CASTILLO

I often use the word "joy" when describing fireworks.

It is a considered word, deliberate in choice.

Not just amusement, entertainment, or astonishment, but joy.

Our art makes us all into children again for awhile.

We become one in our experience for the moment; lost in the sound color and light.

We see large forces, stronger than we could ever be, yet beautiful in their effects.

Sometimes violent, sometimes restrained.

Delicate beyond imagination at times.

Coarse and rude at others.

Deadly force, dangerous, dirty stuff. Crafted with sweat. Controlled by the artist.

Bringing joy to many. Bringing joy.

To me the art encompasses all of life.

Pain and work, plan and mistake, joy and tragedy.

For all the pain, injury and failure we suffer, our efforts bring the joy - the magic - to thousands.

Not a bad return.

Though very few ever recognize the effort, nearly all remember the result,

And all have, for a few moments, the Joy.

The world is better, for an instant.

What more could one want?

Reflections by Bill Withrow

PASSAGES



Randall Mark Feldman

Beloved husband of Linda Feldman for 28 years; loving father of Jessica Lynn and Alison Michelle; loving son to Bernard and Ellen Feldman, and Marian Hammer; loving brother to Michael, Daniel, Adam, and Marshall, and many nieces and nephews. He will be greatly missed by his family, and many, many friends.

I knew Randy well. We met through the WPA back in the early 90s when I joined. He and his identical twin brother Michael helped out on my shows from time to time. He had a long career in pyrotechnics, held basic commercial and theatrical licenses in California and had worked on all sorts of shows from Redwood City Christmas tree lighting to Bay 101 card club to Justin Bieber and Rammstein. When he started out in the seventies there was no Pyrodigital, no China fireworks. Fireworks companies were largely run by second generation Italians who made their own shells, hand fired 12s and kept the secret recipes from Nonno back in Sicily under the mattress.

Maybe he had a premonition. I had dropped in to visit him at his estate in Menlo Park a few months ago after dropping my wife off at SFO for one of her bi-annual Europe trips. "Maybe it's time to quit", he said. "How long can we tiptoe around the dragon?"

Someday I will give you a big hug my brother, in a better world than this.

Mark Devon

PASSAGES



George Bauer, 1945-2014

George supported me in all my crazy endeavors. He so enjoyed sitting in the evenings with me watching the beautiful firework shows you provided for us.

Thank you all for your loving thoughts for myself and my family.

I do miss my George.

Kathy

PASSAGES



MATTHEW MARK DEL CASTILLO

February 14th 1976 - June 23rd 2014

*"Nothing will ever be as sweet or bright.
The air seems stale. The sky's less blue,
And tears weigh so heavy on our hearts."
We miss you,
Mom and Dad*

Matt Del Castillo was a Renaissance Man.

He was a mechanic, engineer, inventor, creator, designer, comedian, magician and rocketeer.

I was so impressed with him that I couldn't wait to see what he was doing next. How many of us can say we chased our dreams and captured them?

When I watched him with children, I could see a light in his eyes, and the children loved him and knew they were safe.

On this Fourth of July and every Fourth after ... look to the skies past the fireworks, because Matt will be controlling the shooting stars.

You have touched my heart and made me a better man.

- Your Uncle Steve



"Life is too short and is full of the unexpected. There are no "do overs," no "second chances," and no "on the next go around." It's now or never. If you are not happy with the cards that you have been dealt, don't waste your time bitchin' about it –change the cards. We have one shot at life. Breathe it. Smell it. Hold it. Taste it. Dream it. Love it. But most of all, LIVE IT!"

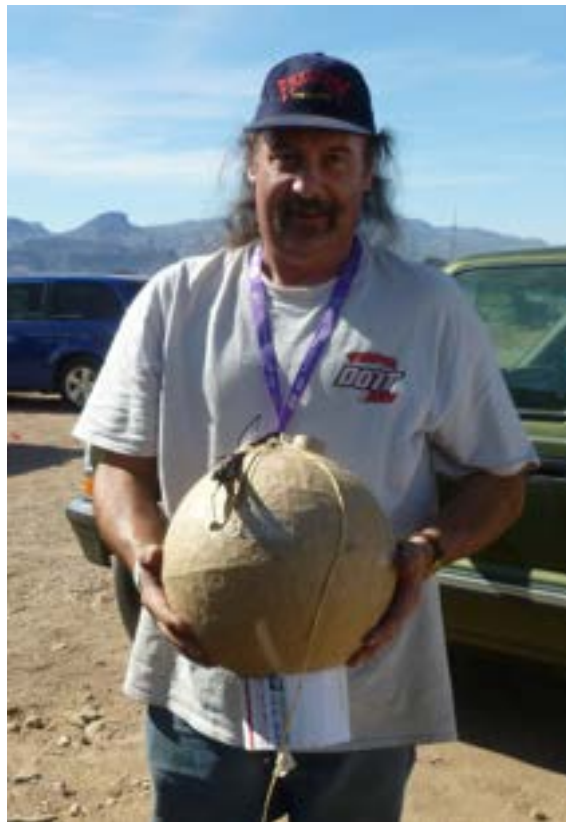
-Matt Del Castillo

WINTER BLAST XXV

Photo Roundup



AM Pyro's Cylinder Shell Building workshop



Greg Martin's 12 inch shell



Peter Brown's strike-anywhere matches hanging out to dry



Kurt Medlin assembles a girandola



Celebrity Guest spotted



Tommy Wohlhieter's 16 inch shell



Ed Osdale and his 16 inch shell



Jim Widmann's WASP is what makes sixteen inch shells possible.



Bill Ryan's fierce guard dogs defend the manufacturing area

Dave Ferguson
took delivery of
an off-road
wheelchair



Just a *little bit* of the commercial show setup in the back field.
It covered acres.





Right: the Jackalope Ferris Wheel
Below: The Burro paddock before the race began





Above: Burros at the starting gate

Below: And they're off ...



Below: Absolute mayhem ensued. A great time was had by all.



KELLY DRELLER

A LAKE HAVASU CITY RESIDENT SPEAKS HER MIND, WITH PICTURES



I take pictures as a hobby. I love challenging things. Fireworks is one of them. This was my first attempt at photographing fireworks and I absolutely LOVED it! I will definitely be doing more of this! The colors and patterns that are achieved by the people who make these fireworks are truly amazing and awe inspiring. I am very happy I was able to capture at least some of the wonder and share it. I know the joy I received from the shows and the experience is something I sincerely treasure.

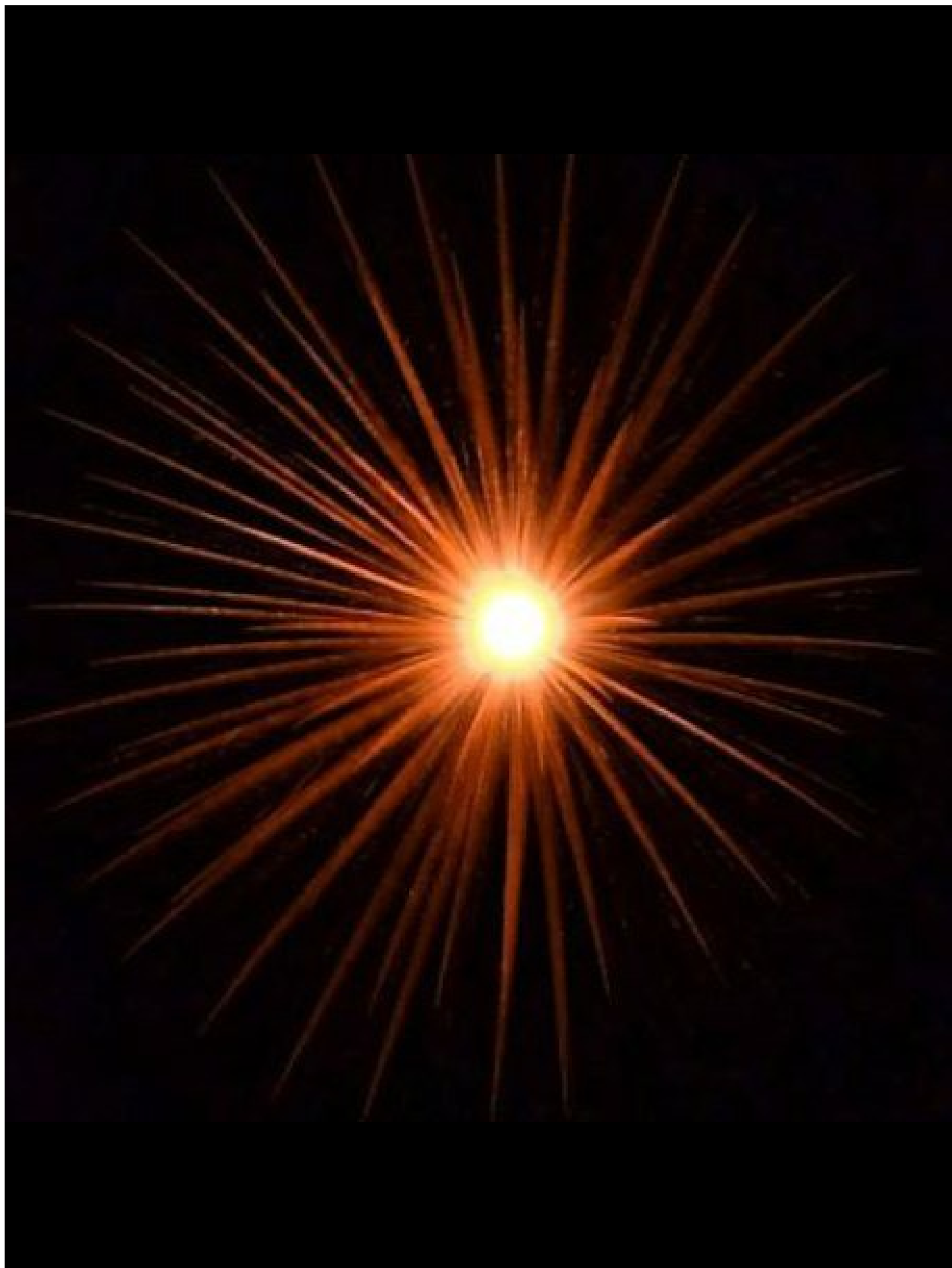
Thank you for letting me share some of my photos in your newsletter.



















Las Vegas Mini Maker Faire®

Jason Creager, Greg Adler and Pete Hand manned a booth at the Las Vegas Mini Maker Faire in April. We had over 100 people spend five to ten minutes or more talking about the club. Most significant visitor of the day was an Asian guy who gave his name only as "Tony" and didn't listen much but kept interrupting with a lot of questions. Turned out he was Tony Hsieh, CEO of Zappos and the driving force behind the Downtown revitalization project. We had his attention for twenty minutes.



Maker Faire®

Wally G and Dave X organized a booth at the Bay Area Maker Faire in May. Mike Garrett reports:

Once again, Wally G and Dave X did an outstanding job of putting together a very impressive booth for the WPA at the Maker Faire. They made sure we looked sharp and represented the WPA well. The booth was manned during the event by a hardy group of volunteer members that fielded questions about our club, hobby, and passion for two days. We had a great looking display of photos, video, pyro tools, and inert models that really caught the eye of people walking by and allowed us to easily and quickly engage them.

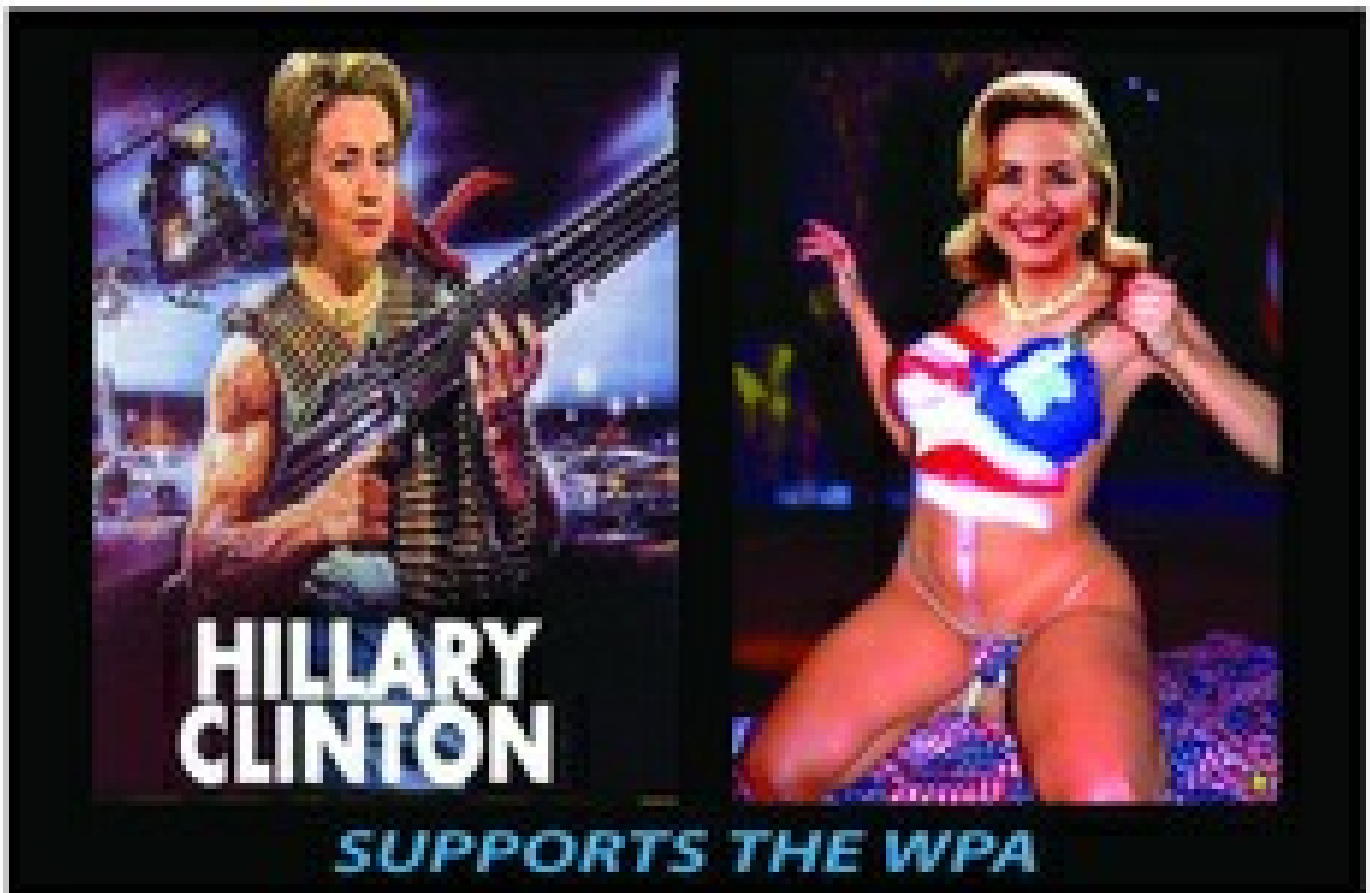
Our booth was located on an outside corner position which allowed good access from the both the front and one side. Traffic through the booth was more or less continuous with very brief moments of inactivity for the entire weekend. There were times when all 5 or 6 volunteers were each engaged with different small groups of Faire goers simultaneously. Sometimes the crowd around the booth was 3 bodies deep. Like last year, most people we talked to were intrigued with WPA and what we do as a club. I fully expect there will be some new enthusiastic members from our efforts.

I want to give a huge shout out to everyone who helped with the Maker Faire booth. I won't embarrass myself by trying to name everyone involved and accidentally leaving someone out. However, everyone who contributed time, materials, supplies, support, snacks, drinks, and sweat deserves a "Thank You". It really was a team effort lead by Wally and Dave. Great job, guys!



The WPA is represented this year at the PGI event in Mason City, IA. Richard Haase is taking care of the booth and is armed with as many supplies as we can give him, including hundreds of tri-fold brochures and, courtesy of Todd Hall, a very professional banner for the wall - or so I'm told.

I received a copy of the allegedly professional banner, which I reproduce below. It seems a bit off topic to me. Maybe there's another one that I haven't seen.





I learned from our friends in the UK Pyrotechnic Society that Britain is taking baby steps toward becoming a free country again.

Those of you who take an interest in European affairs will have heard of the dismaying move by the EU Commission to control the sale of “explosive precursors” - by which they chiefly mean chemicals of interest to us, including nitrates, chlorates, perchlorates and anything involving barium. Under the pending regulations, possession of these chemicals would be restricted to those holding a license, which in general means owning a business with a legitimate need. The way these things work is that the EU Commission (which is appointed, not elected) issues decrees and gets a rubber stamp from the European parliament, and then every member country is compelled to pass them into law.

Britain, it appears, got ahead of the game by appointing its own Commission to look into regulation of “explosives and poisons”, which covers both oxidizers and barium compounds, and they invited members of the UK Pyrotechnic Society (amongst others) to comment. The response was not overwhelming - only 45 responses, according to the Government report - but it would seem most of them were very persuasive members of the UKPS. The outcome was very interesting, and positive.

The Government has carefully considered the responses to the consultation and has decided to proceed with Option 3: to allow the general public to purchase Annex 1 chemicals above the concentration thresholds if they hold a valid licence.

We have taken stock of the many important issues raised during the consultation and will use the details provided by respondents to develop a practical and simple approach to implementation of the regulation.

What that means, in effect, is that they’re going to continue to allow people in Britain to buy what they need to make fireworks, regardless of what the EU Commission intended. The “practical and simple approach”, translated into normal English, means “we’re sorry about the irritating license requirement, but we’ll make it simple and cheap for you chaps to get the bloody thing”. In a world where it seems another freedom is taken away every day the legislature is in session, it’s a wonderfully refreshing change to hear about lawmakers actually listening to the public, recognizing our hobby as a legitimate public interest, and framing the law accommodate us. Well done, UKPS.

The new regulations come into effect in October. Here are some British firecrackers - go celebrate.



Seen on the Intertubes ...

The image is a screenshot of a Kickstarter campaign page. At the top, the Kickstarter logo is on the left, and navigation links for 'Discover', 'Start', 'Search projects', 'Sign up', and 'Log in' are on the right. The campaign title is 'A Pitchfork And Torch for Every Household' by 'T. Party and O. Wallstreet'. Below the title, there are tabs for 'Home', 'Updates' (23), 'Backers' (2,790,776), and 'Comments' (6,112,286). The main image shows a row of pitchforks against a blue sky with clouds. To the right of the image, the campaign statistics are displayed: 2,790,776 backers, \$34,489,327 pledged of a \$100,000 goal, and 48 hours to go. A green button says 'Back This Project \$1 minimum pledge'. Below this, it says 'This project will be funded on 09/02/14 at 12:00 PM PDT'. At the bottom left, there are social media share buttons for Facebook, Twitter, and Embed, along with a 'Remind me' button. The project description starts with 'Whether it's Congress or Wall Street that gets you riled up, no protest can expect to be taken seriously without the proper equipment. Join this project to fund the basic items. For larger items like guillotines, see'. On the right, there is a 'Project by' section with a small image of the creators and the text 'T. Party & O. Wallstreet Everywhere'. At the bottom right, it says 'K First created · 0 backed'.

KICKSTARTER Discover Start Search projects Sign up Log in

A Pitchfork And Torch for Every Household

by T. Party and O. Wallstreet

Home Updates 23 Backers 2,790,776 Comments 6,112,286

We Are Everywhere Web

2,790,776 backers
\$34,489,327 pledged of \$100,000 goal
48 hours to go

Back This Project
\$1 minimum pledge

This project will be funded on 09/02/14 at 12:00 PM PDT.

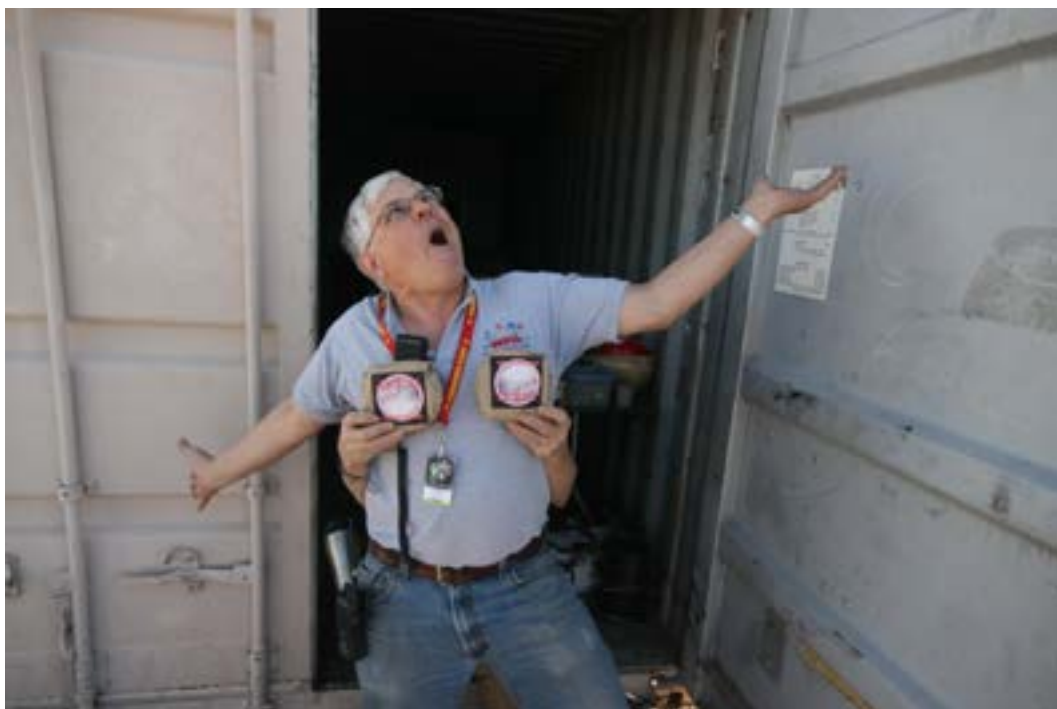
Project by
T. Party & O. Wallstreet
Everywhere

K First created · 0 backed

Whether it's Congress or Wall Street that gets you riled up, no protest can expect to be taken seriously without the proper equipment. Join this project to fund the basic items. For larger items like guillotines, see



I have *absolutely no idea* what's going on here at the manufacturing day bunker. But as always I am completely impartial and non-judgmental. I report, you decide. Or something.



DO IT

It's that time again, folks. **DO IT** will be held from September 25th to 28th in Hawthorne, NV. Set up on Wednesday 24th , clean up on Sunday 28th.

The cost is \$60 for a member, \$25 for a spouse or student member, \$10 for children. There is an additional clean-up fee of \$15 per member. As always, the clean-up fund will be distributed between those who actually stay Sunday and help.

You must be a member to book.

If you haven't yet become a member but decide to join to attend **DO IT**, note that we've changed the membership policy this year. Formerly, membership ran for the calendar year or any part thereof, so always expired on December 31st. Now, membership runs for a year from your date of joining, so if you sign up on September 1st you're good until August 31st the following year.

DO IT is fun. **BE THERE**. Otherwise we'll set Pete Hand on you, and you don't want that. No siree.



Chuffer Rocket Goes Astray at WWB25 - New Rule in Effect

On Sunday night February 16th, the last night of WWB at about 9pm a chuffer rocket fired in a normal manner from the open B rockets area went astray, finding it's way into the roof of an RV parked way up by the highway in the upper parking area. Because of when it occurred (right at the end of the convention) and perhaps having come on the heels of the Feldman incident, the event went mostly unreported to the general membership until we had a better understanding as to what really occurred. None of us had ever seen a rocket go that far from the site before, and in that direction (eastward).

After some analysis by a few of our resident rocket experts and going through the routine with our insurance carrier, we can now report that a new rule has gone in effect for chuffer rockets at future Winter Blasts. That, basically, is until further notice, we cannot shoot chuffers at this site. This does not affect Do It, which has way fewer targets in any direction.

An explanation of chuffers follows written by Pete Hand. But in a nutshell, the overall impulse, duration and payload capacity of chuffers is considerably different than conventional BP rockets. As such, it has now been proven that these kinds of rockets can easily go off course, and for quite a distance before deploying their payloads. This poses an unacceptable risk to the public surrounding SARA Park.

"For a start the thrust is rapidly turning on and off, hence the "chuffing" noise, and its actual mean thrust is very much less than it appears. For a second thing, it burns for a long time, as rockets go – it's still producing its mean thrust after seven seconds. This causes two issues. First, it isn't as powerful as it appears, so it doesn't take off very fast. Second, if it happens to go off course, the motor can continue to drive it a long way in six seconds.

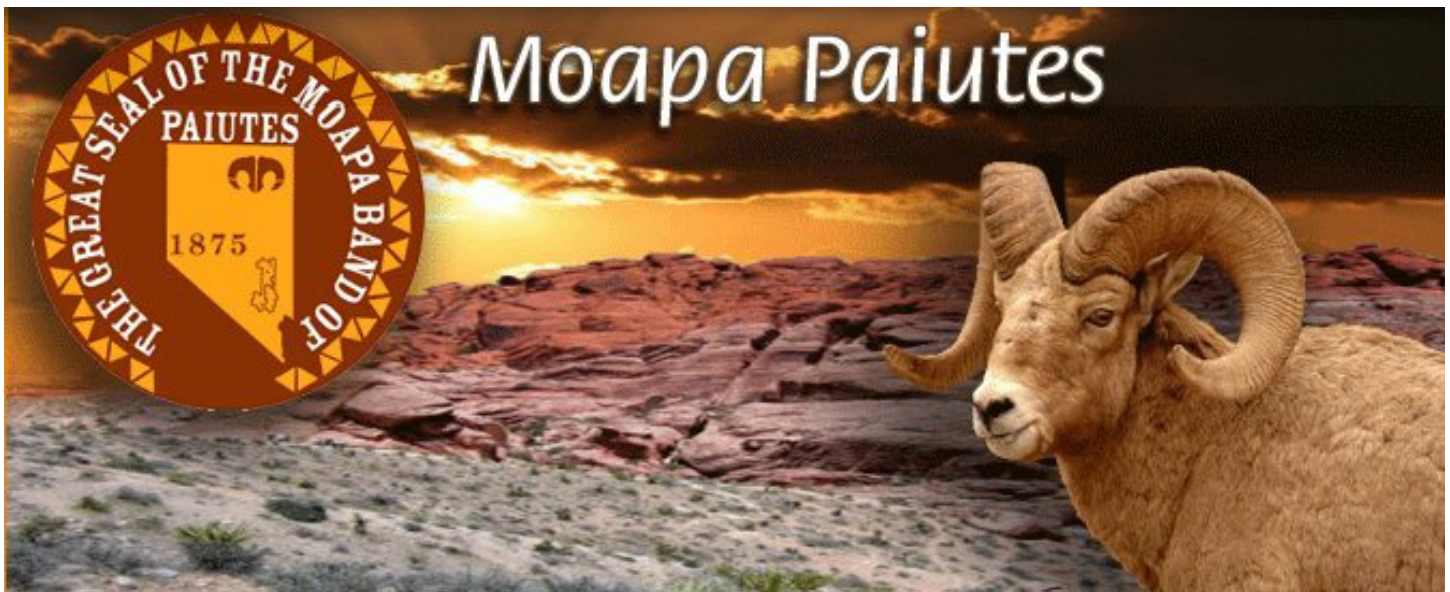
When a rocket takes off, it's like standing on its exhaust with most of the mass above it. Gravity is tending to pull the head down. In order to do that it has to rotate the body and stick, which has inertia, and aerodynamic drag on the stick acts in the opposite direction to oppose the turning moment. This drag is proportional to the third power of speed - speed cubed. A rocket that takes off very fast is not only moving fast in a straight line before gravity has time to rotate it very far, it also takes the best possible advantage of stick drag. But a rocket that takes off slowly is in trouble. It doesn't develop enough drag on the stick quickly enough to fly straight up. In fact, it's a problem that's been discussed on the forums that sometimes the stick actually breaks off as the rocket leaves the tube. The reason for this seems to be that with a heavy header, it tips over and bends the stick before it leaves the tube, and the stick springing back as it leaves the tube causes it to break. Then the rocket goes wherever it likes, but not upwards.

It is easy to understand then how a chuffer would rise up for a couple of seconds, and then as the thrust falls away would slow down, turn in the air and fly more or less horizontally for the next several seconds. This in itself is not a big deal. The problem is that it was carrying a large salute header, too heavy for the rocket and obviously of considerable destructive power."

Pete's note: I dug up the original chuffer article in AFN by the inventor, the late "doc" barr, in which he warns: "These rockets can carry a small garnishment, but they do not have as much thrust as a black powder rocket."

Unfortunately, the rocket in question at WWB managed to pierce the roof of an RV and the heading went off inside a cabinet in the interior of the RV. Luckily, no one was in the RV at the time and the damage was confined pretty much to the immediate roof area and cabins. Our insurance, with \$5000 deductible, is handling the claim in a peaceful manner. The owner of the RV was thrilled to have watched the weekends festivities and wasn't of a mind to be unreasonable about the incident.

Steve



I'd like to bring everyone up to date with what's happening out at Moapa, NV.

As most of you know, at the General Meeting this year considered a proposal made to us by the Herbst organization, through Kief Adler, to move the Winter blast event from Lake Havasu City to a new site at Moapa, NV. Troy Herbst did not show up as promised to support the proposal, and the members had many reservations, so no action was taken and the proposal was tabled.

Some weeks later, Jason Creager talked with Phil Stewart, a Pyrotecnico employee, and Phil gave us some interesting further information. The Tribe is in the process of building an event center at Moapa which they intend will be the ultimate go-to location for everything pyrotechnic in the southwest, and the real proposal is not that they host Winter Blast, but that the WPA should become a part of the project. The Herbst organization is no longer involved and we are dealing directly with the project management.

The Board appointed a committee to pursue this, consisting of Greg Adler (chair), Jason Creager, George Cacilhas, Dan Stegmann and Pete Hand. The committee had an introductory meeting in late June with Michael Qualheim, the project manager, to come to an understanding of what we can offer the Tribe and what, in turn, they can offer us.

Negotiations have hardly begun so it is premature to say very much, but what we are seeking from the Tribe is a permanent - or at least a long-leased - facility where we can keep a magazine, and where members can go to manufacture and shoot year round. In return for this, we will shoot our product at their public events. Nothing has been proposed yet about moving Winter Blast or Do It, though it has been mentioned that perhaps we could hold a "Summer Blast" event.

This could be a very valuable project for the WPA. We're moving cautiously on it, learning what legal (ATF) obligations we'll be taking on with the magazine so that we understand what we're getting into before we commit to anything. Your comments are invited - use the mailing list - and we will keep you informed of progress.

Pete Hand



BLACKFINGER'S INSERT WORKSHOP

Since we learned recently that Flying Phoenix will not be able to import inserts in future, we're going to have to make our own. Inserts are not stars or comets, but cardboard tube devices that go up with a shell or rocket and *do something interesting*. I'm going to describe Serpents, Butterflies, Tourbillons and Hummers today.

The Serpent is essentially a short stickless rocket with spark-enhanced fuel. After the header bursts it flies around in random directions like a crazy hornet. Since it doesn't need to raise its weight from the ground it doesn't need much force, but it does need more than a typical gerb or it won't fly around in the sky. An end burner with a nozzle will usually do very nicely. Serpents can be, and frequently are, enhanced with a report.



The Butterfly - also known as a Farfalle - doesn't jet or spin, but emits a thick double spray of sparks that (with a bit of imagination) look a bit like butterfly wings. It's a short tube closed at both ends, filled with spark composition, with a hole drilled straight through (one hole directly opposite the other) at the center point of the tube. Everything is balanced. The jet coming out of each hole opposes the other, so there is no net driving force, and the tube is balanced around the jets so there is no turning force. Butterflies are filled with a fairly gentle composition with lots of titanium for a thick spark effect. The insert that Flying Phoenix sold as a "tourbillon" was a butterfly.

Left: Butterflies butterflyflying. Below: A Flying Phoenix butterfly



The Tourbillon is made in the same way as the butterfly, except that it has one hole drilled in the sidewall near each end, on opposite sides to each other. The jets coming out of these holes make the casing rotate about its center point, creating lazy spirals of fire in the sky. Tourbillons are filled with a fairly fierce mixture to create thrust, with titanium for effect. You can use an uncut tube for tourbillons – the longer the tube, the slower it will spin. An alternative form uses a shorter tube with a hole at one end only – this would more properly be called a Saxon, and it creates curly tadpoles in the sky instead of spirals. One-hole saxons can be topped off at the unfused end with a ¼ teaspoon of flash for a final report.



The Hummer is an unfeasibly large vehicle for taking the girls to soccer practice – oh wait a minute – no, it's a short tube, usually an inch long, closed at both ends. It has a single hole at the tube center, drilled tangentially. The jet coming out of this hole causes the tube to spin rapidly on its axis, creating a characteristic rising “whoop” sound. The speed of the spin determines the pitch of the sound, and good hummers can spin up to astonishing speeds, more than 50,000 RPM, in less than a second. The visual effect of hummers is less important than the sound, so they are filled with a fierce mixture that is only moderated a little with titanium or aluminum.

Left: half inch hummers

Tools

All these inserts are rammed with a mallet and drift. Since there are no cores to form, a simple flat ended rammer can be cut from 3/8 inch brass or aluminum rod, or even wood dowel, though wood tends to split and doesn't last long. For a mallet, traditionally hide is best, though hard to come by. I use a 3 pound orange plastic dead blow mallet from Harbor Freight. HF also sells a 2 pounder that is a bit less effort to swing and works nearly as well. Hard rubber mallets also work. Don't use a regular steel face hammer – it will damage your tooling and could cause sparks. You will need a ramming post, like a piece of 4 by 4 set on end. To handle the composition you need a quarter-teaspoon scoop, and a small funnel to get the stuff inside the tube. You need a 1/16 or 3/32 twist drill, and a 3/16 drill bit for serpents. You can use an electric drill when you're not drilling into live composition.

It's worth making a jig for drilling the side holes in hummers. Choose your tube first – either the suggested 3/8 tube or one inch lengths of 1/2 inch ID rocket tube. Take a short length of steel or aluminum right-angle and drill a 3/32 hole in the middle on one side, one tube thickness above the angle. Hold the tube in the angle and drill through the hole, and it puts the hole in the tube in exactly the right place.

Materials



These inserts are designed for small shells and headers, up to about 3 inches, and assumes 2 ounce paper tubes. If you want something larger, use a bigger tube and scale up. Skylighter item TU1008 is a 2-ounce tube, 3/8 ID and 3 1/2 inches long. For butterflies and short tourbillons these can be cut down to about 2 1/2 inches long. The leftover 1 inch is just right for hummers (though I prefer 1/2 inch ID). If you make larger shells or headers, scale up appropriately.

Use plain old Bentonite clay like Skylighter CH8078 for bulkheads. Kitty litter and Hawthorne Bond don't consolidate very well at this scale. Sodium silicate (water glass), if available, can be used for fireproofing the small holes. This is particularly beneficial for hummers. Only a tiny amount is needed. You will also need toothpicks to apply it.

Have available masking tape, hot glue, as required. Also bare black match in 2 inch lengths.

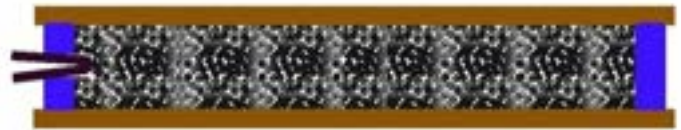
Composition

The basic composition is slow black powder, 60 parts potassium nitrate, 20 parts charcoal, 10 parts sulfur – note that doesn't add up to 100. I strongly suggest ball milling this mixture for a couple of hours. The balance is tail composition, either 10 parts of titanium 120 mesh or coarse flake aluminum 20-40 mesh, mixed in after the powder comes out of the mill. For a hotter composition use 65 parts nitrate, 15 parts charcoal, 10 sulfur, but

start with the mild version and work up. For the ultimate hotness use standard 75:15:10 powder with the metal added to slow it down, but these may behave more like salutes.

Titanium makes a very thick, brilliant white tail. It's absolutely the preferred metal for visual effects. Aluminum flake makes a more diffuse tail, with bright white sparks more spread out. I personally haven't tried magnalium, magnesium, ferro-titanium or steel filings, but all should work and give different effects. If you try these, use a fairly coarse mesh.

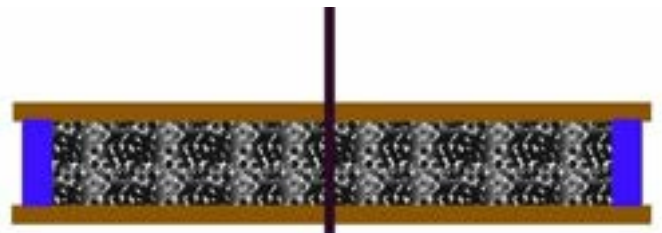
Don't use whistle mix for any of these. All except the serpent will explode, not whistle. If you must make whistle serpents, press them instead of ramming them and don't use a clay nozzle at the business end.



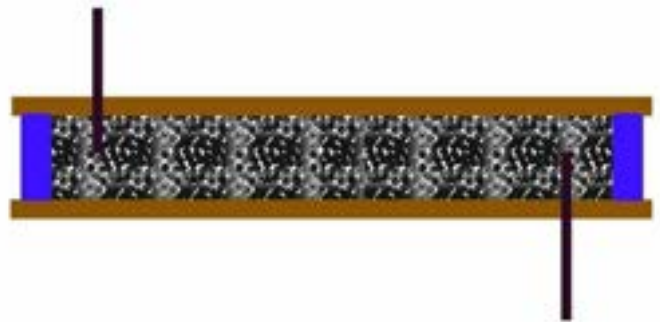
Typical Serpent cross-section

Preparing the tubes

Before you start, cut the tubes to length and drill the side holes for tourbillons, butterflies and hummers. You can use a power drill for this. The size of drill depends on the thickness of the black match - smaller is better. Try 1/16 first and go up to 3/32 if the match doesn't fit, but no bigger. For tourbillons, drill one hole at each end about 3/8 from the ends, on opposite sides. For butterflies, find the center of the tube and drill straight across, in one side and out the other. For hummers, find the center of the tube and drill one hole that comes out inside the tube at a tangent to the inner wall - see drawing. It's useful to make a jig to guide the drill for this.



Typical butterfly/farfalle cross section

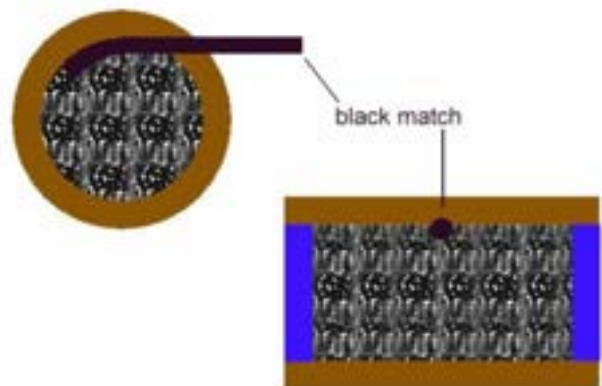


Typical tourbillon cross section

It's not essential, but for best performance use a toothpick dipped in sodium silicate (water glass) to fireproof these small holes. The performance will be improved by preventing the holes from enlarging when the thing goes off. I did some experiments with hummers and found that the hole without fireproofing enlarged from 3/32 to nearly 3/16 during the one second burn, while the fireproofed holes didn't enlarge by any significant amount and the sound was much better. Set the tubes aside to dry before filling them - they dry quite rapidly, a couple of minutes should be enough.

Ramming Safety

There's always some danger. Black powder on its own hardly ever causes a ramming accident, but mixed with titanium is more hazardous. Wear a long sleeve cotton shirt, leather gloves and eye protection. Have a fire extinguisher handy, and a 5 gallon bucket of water. Should there be an ignition the first thing that will happen is the rammer will shoot out of the tube like a bullet, so don't put any part of your body in the way of it at any time. The next thing that will happen is the insert will take flight off the ramming post, spitting fire and looking for the most inflammable thing it can find, so keep the area clean and wipe up spilled powder as you go along. Don't have any finished goods in the vicinity, and don't have an open tub of composition nearby. Make a habit of opening the lid,



Hummer section across the center and along the middle, showing hole & fuse position

taking a scoop of composition, and closing the lid properly before ramming. If an accident should happen, drown anything set afire with the bucket of water first, and then use the extinguisher on anything residual. If the burning insert gets involved with you personally it will burn you, but it won't kill you or maim you – it's not big enough and it only burns for a second or two. It will hurt like hell though. Protect your eyes, hands and face and keep your clothing buttoned up so nothing can fall inside. Finally, if your extinguishing efforts fail and the fire starts to spread, don't be a hero – *run away*. Houses can be replaced.

Ramming an insert

Set the end of the tube on a solid ramming surface. Note, the not-cut end of a tube will be square, while the end you cut probably won't be. Set the square end down. If you like, you can close the end of the tube first with a piece of masking tape. This makes it easier to get started without spilling loose clay out the bottom end of the tube, and the tape can easily be peeled off afterward, or cut neatly and left there. While holding the tube firmly on the block, pour in a level $\frac{1}{4}$ teaspoon of dry bentonite clay through a small funnel. Ram the clay solid using half a dozen solid mallet blows. Don't be afraid to whack it hard. It should consolidate to a plug at least $\frac{1}{8}$ and closer to $\frac{1}{4}$ inch thick. Use a little extra for tourbillons and serpents, as their plugs are stressed. With hummers and butterflies the plugs don't experience any pressure until the effect is nearly over, and they can be thinner.



Now add the composition by small increments, about a heaping $\frac{1}{4}$ teaspoon at a time, and ram each one solid with several firm blows. Do this until the tube is nearly full. Whenever you come to a fuse hole, thread a piece of black match into it before you ram that increment. If you're making a tourbillon, the first hole should be just above the clay plug. Butterflies and hummers will have holes near the center of the tube. Tourbillons will have one each end, and serpents won't have any. Poke the hole clear with a toothpick and thread bare black match into it, leaving about an inch outside. Make sure it goes into the empty tube space, all the way across. Fold the outside portion against the tube wall and put a turn of masking tape around, to cover the hole

and secure the black match. This serves to secure the match and stop composition blowing out of the hole as you ram. You should remove it when you're done, but as long as there's enough exposed black match to take fire, it won't hurt if you forget.

When the tube is nearly full, ram another clay bulkhead in the open end. The easiest way to do this is to plunge the open end of the tube several times, hard, into the bag of clay to form a semi-solid mass, then consolidate it with the rammer and mallet. It will inevitably be a bit short of the end of the tube and may not be very thick, but that doesn't matter except in double ended tourbillons, where you should leave a bit more space for clay to make sure the plug is solid.

Alternatively, if you decide to put a report in the end, stop well short of the tube end and pour in a quarter teaspoon of flash. **DO NOT** ram the flash! Pour it in loose, shake it down and and close the tube with a chipboard disk or plug securely glued in.

If you're making serpents, the final step is drilling the nozzle hole. **DO NOT** go at this with a power drill! Take a drill bit and spin it between your (leather gloved!) fingers to make the hole in the bottom bulkhead, the first one you rammed. For a $\frac{3}{8}$ inch tube, use a $\frac{3}{16}$ inch bit. It doesn't need to be exactly centered but it should be parallel. The clay is easy to drill, and this will also give you a chance to see how well the clay consolidated, because it shouldn't crumble and fall out. You're through when black composition starts coming out of the hole.

Keep going and take the hole about 1/8 inch into the composition. Then take a 2 inch length of black match, fold it in half, and push the fold into the hole as far as it will go, leaving a short tail outside.

Testing

It's not always convenient to fire a shell, but these inserts need to be tested in the air to evaluate them properly. You can shoot them one at a time out of a 3/4 tube, using about 10% of the insert weight of black powder. The 3/8 tube is a very sloppy fit in a 3/4 inch mortar and won't go very high. By design, they should burn for between one and three seconds. Hummers are over much quicker, in less than one second. I test them for sound only by lighting one in a 5 gallon metal bucket with a piece of plywood held over the top to stop it escaping.

Using inserts in shells and headers

Tubular inserts pack best in canister shells and headings, though you can cram a few into a ball shell. Six half-inch hummers fit neatly into a 3 inch ball shell, in a hexagon around the fuse. None of these inserts needs priming – the black match is sufficient. The burst does not need to be ultra violent, flash boosted or whatever, though if you mix the inserts with stars you can use whatever burst is appropriate.

An interesting effect – I have never tried this – might be hummers with delay fuses, so that they go off whoop – whoop – whoop one after another. Time delay can be created by using thin visco instead of black match, cut to various lengths. Unlike black match, the end of the visco *would* need to be primed with a good size blob of meal black powder in NC resin. I would also glue it into the fuse hole with a dab of hot glue, to prevent burst fire slipping past the fuse and igniting it prematurely.

Ok – time to go and INSERT something, as they might say in Virginia.



Single ended Tourbillons (Saxons) with purple stars in a rocket header by TR

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