November, 2011, Vol 22-2&3

Western Pyrotechnic Association Newsletter



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WPA Newsletter, Volume 22, Issue 2

November, 2011
Volume 22, Issue 2

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Editor Comments

By Tom Calderwood, V.P. Publications

Is it late? Or is it early? It's BOTH! Two things folks:

1) Call this the Mondo-Overly-Large-Huge-Monstrous-2'fer Newsletter That's Less than 20 Pages! Aw, who am I kidding? My work schedule got me snowed this year, and this one is late. I seriously doubt I can get another out before WWB.. And that leads to:

2) It's been a huge pleasure in you letting me serve the club as your publication's chairman. However, health issues and work schedules is taking me out of the game. My term is up and this is my last year as publications chair. Someone else needs to step up. Someone that has some savvy about layout, software, Adobe Acrobat, inDesign (or MS Publisher), and an awareness for file sizes. I've brought it to an all-electronic format and, so far, it's been a huge money-time saver for the club.

If you would like to take over this job for the club, contact me right away and I'll fill you in on all the poop that makes this job a job. I'm not going to sugar coat it—it will take time. If you don't have it to give, it will be totally frustrating. It's also not something that you want to cut your teeth on ("Oh, I'll just read the manual" or "I'll learn it online"). Also, you're input to the club will be a lot higher as you will have a position on the board of directors.

Are you up to it? I'll sweeten the pot: I'll mentor through the first newsletter as well as help out with the program (if you want). I'll get you all the stuff I've worked on and introduce you to LHC printers we use. When I took over this job, it was done cold-stone-turkey and I don't want to see anyone having to go through that. Not sure about how to do the cover? I can cover that. Pictures? All you need and more. Deal? Let's talk. Use my personal email: tom@thecalderwoods.org

- Tom

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What's Happening?

By Pete Wood, WPA President 2011

What's happening? A LOT!

We have a great WWB coming up with our PD being orchestrated and choreographed by Aaron Mayfield of AM Pyro, out of Buffalo, Missouri. Aaron has promised a display that we will all not soon forget. Trust me, I know Aaron and (as do a lot of our members) this isn't one we want to miss! He (Aaron) is also providing two demo's during the week to entertain the public and us.

On top of all of this, he will be offering a shell-building seminar as well! All without additional cost to the club or the city! Now that's a gift! Thank you to Aaron and Amber Mayfield and the crew of AM Pyro! We appreciate and acknowledge your generosity!!

We have other demo's as well, along with a Member's Showcase for our manufacturers on Sunday night. Let's recognize and support our members who will travel long distances, build and create items and effects during the week, for our enjoyment (at their own expense and time). It's only fair. We did this at last September's DO IT in Hawthorne, and thanks to Blue Parish (showcase organizer) and the club manufacturers, it was a total success! Please don't miss it – it's all part of what we do and why we are here.

There will be other demos on Friday, Saturday and Sunday. I foresee no shortage of entertainment for everyone's tastes and expectations.

Secondly, I know a question remains as to whether or not we will allow MIM (minors in manufacturing) at WWB. The answer is that, after reviewing how MIM went at DO IT in the Fall of 2011, and given the space requirements at Sara Park, we (the BOD's) have unanimously decided that MIM will be restricted to the DO IT event only and not WWB. For the time being! It is our hope and desire to bring it to WWB, but we feel we need more time to finalize the program to insure a workable program.

We still have bugs to work out and we want the most comprehensive policy in place before we try and bring this to WWB. Don't get me wrong – we had a great time at DO IT, but we were faced with issues and questions that require more discussion and organization. The minors that did take part were totally respectful, attentive and asked all the right questions. We just need more time to fine tune the process and make the requirements understandable to all participating.

As one of the many organizers and overseer's of this, I thank the minors involved and their parents for working side by side with us to obtain the clarification needed and their patience and professionalism.

Now on to the third item – ELECTIONS!

This year as many of you know, there will be three BOD positions up for grabs. One is mine – President. The others are Treasurer, and VP of Publications. None of us can do this forever, nor is it a feasible or productive venue.

The club needs fresh ideas and direction. Now is the time. If you have ever had inkling to try out the water and be a part of leading this (the USA's second largest pyrotechnic organization) club forward, PLEASE DO! It will be a bit of work and require that you have the time to devote, but in the end, rewarding knowing you have helped continue on the tradition of freedom and fireworks in America. Plus, in addition, YOU might be the one that gets to write the next Presidents, Treasurer or VP of Publications newsletter article! How cool is that? J

If you interested in any of these positions and want more info on what's involved, please feel free to contact me and I'll put you in touch with the current BOD's whose positions are up for grabs so you can get a better idea of what's involved.

Lastly, as this is my final article as the WPA President, I have a few things I would like to say, so please hear me out.

First of all, after serving on the BOD's for almost six years, I can now look back and feel satisfied that progress has been made, despite the regulatory changes and restrictions. We are still here and I'm confident we will be, provided we maintain vigilance and don't let fear and the beauracracy get to us. Plain and simple – our regulators don't necessarily want us gone – they just want us to play the game their way. I say – meet them half way. They are approachable and I have maintained a very good repore with the BATFE. They are not to be feared, but rather worked with. We have always come to a mutual agreement in the past and I foresee no change in the future.

I would like to thank all current and past BOD's for their support and advice during my time on the BOD's. I couldn't have done it without your help, support and guidance! I promise the same for my successor or any of the other positions up for re-election. You won't be going into this blind. We will help and advise, but don't forget – this will be YOUR vision, YOUR ideas and YOUR goals – not ours. It's YOUR time! Make good use of it and don't be afraid to make the hard calls or decisions – after all, that's why you are here. Nothing is unattainable if you try! If you don't try, failure is imminent. Never forget that.

Thank you to all the membership for allowing me the privilege to be your President. It has truly been an honor and a privilege – an experience I will never forget. Thank you!

See you all in February in Lake Havasu City, AZ for WWB XXIII!!!

Let's ROCK THE NIGHT!

Pete Wood WPA President 2011 / 2012 (a bit of 2012)

The Secretary Mutters

by Kathy Bauer*

Hello Everybody! You know what? It's coming up on Winter Blast! So what are you doing just sitting there reading this? Go online and register for crying out loud! Spend a lot of money, volunteer for everything, arrive early and stay late and SPEND YOUR MONEY! What? You're still reading this? GET OFF YOUR DUFF and register! It's on line—how hard can it be? Cripes!

*(NOTE: When I asked Kathy for a newsletter blurb, she said "Can you make up a sentence for me about looking forward to winterblast?" So I did. I bet that's the last time she does that. - Tom)

(Oh, Greg asked to do the same thing, but I'll just leave that one out. He's a lot bigger than me, and I don't like getting hurt. - Tom)

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A Note from the Treasurer

by Debbie Ludwig

Hello fellow members! It's that time of year to gear up for WinterBlast!!! Sorry I couldn't make it to Do-it, I hope to go next year though. I hear those who did go had a great time and the whether was good for you all. As of this writing I don't have all the final numbers so I cant provide a financial statement for Do-it. Once I do though maybe I can post to the list the totals.

This Winterblast we have 3 BOD positions up for election, mine included. I have been your Treasurer now for 3 years and do plan to seek re-election in 2012 at the Blast. I would like to stay on the Board to serve the club and have a say on what happens for our club. I have my own opinions and certainly voice them. I also believe the club is benefited by my voice as I am a California licensed pyro as well and have had my license (for those of you who dont know) for almost 10 years now, prior to that I crewed for many other operators for about another 10 years. My experience is beneficial for my position and my vote.

Now everyone start packing, make your reservations, renew your membership and we will see you in Feb 2012!!! Lake Havasu here we come!!!



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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 be sure to use their services.



WESTERN PYROTECHNIC ASSOCIATION
Minutes of Board Meeting
October 19, 2011

- Meeting called to order at 7:08 pm
- Pete Wood, Tom Calderwood, Greg D, Kathy Bauer, Debbie Ludwig
- Discussion by the board of Do-It 2011 and Minors in Manufacturing (MiM)
  - Discussed the need for a more in depth safety meeting for the parents and kids in manufacturing. Might be a good idea for all new members who have never attended a WPA event before.
  - Discussed differences between the manufacturing areas of the Hawthorne site vs. the Sara Park site.
  - Discussed the learning experiences for all. Will still need refining of rules, although we now know more to be able to keep a safe environment for all.
  - Motion was made to continue Minors in Manufacturing as a Do-It experience only at this time; subject to review.
    - 5 in favor 0 opposed. Motion passed to keep MiM at Do-It only at this time.
- Discussion of WBXXIII
  - Changes need to be made to membership form and WB registration, waivers and other forms.
  - Tom will check into Life Scan for background checks for new membership applications.
  - Discussion of current member/vendor and his participation in bringing attention of the D.O.T. and WWBXXII.
- Meeting adjourned at 9:12 pm.

Respectfully submitted
Kathy Bauer, Secretary



http://www.pyronovelties.com

Trigonometry

Article from the Rocky Mountain Pyrotechnics Guild's newsletter "Hothead"

Courtesy of Charlie Wilson

Trigonometry

(Article from the Rocky Mountain Pyrotechnics Guild's newsletter "Hothead", courtesy of Charlie Wilson)

I know, you may have had it in school but likely forgot it. Here's a simple application that can be used to find the height of a shell burst above level ground.

The method requires an accurate measure of distance, whatever your favorite unit is, from you to the mortar. Then, using a tool called a 'clinometer' or 'inclinometer' (picture courtesy of Wikipedia), you find the angle of your view of the burst. Then using the distance from the mortar, and the tangent of the angle you find, multiply the two to get the height of the burst.

In the illustration, the distance chosen to be away from the mortar was 100 feet, just to make the math easier. The tube of the clinometers is simply hollow and is used to sight the shell. This is really a daytime task if your shell does not have a rising effect.

Note the weight attached by strings to the center of the scale. When looking straight at the mortar, the weight will hang straight down and the string will be over the 0 position. The tangent of 0 degrees is also 0, i.e. no altitude.

Suppose the clinometers, looking up, finds the angel to be 55 degrees and you are 100 feet from the mortar. The tangent of 55 degrees is 1.4281, so the height of the burst is roughly 143 feet.

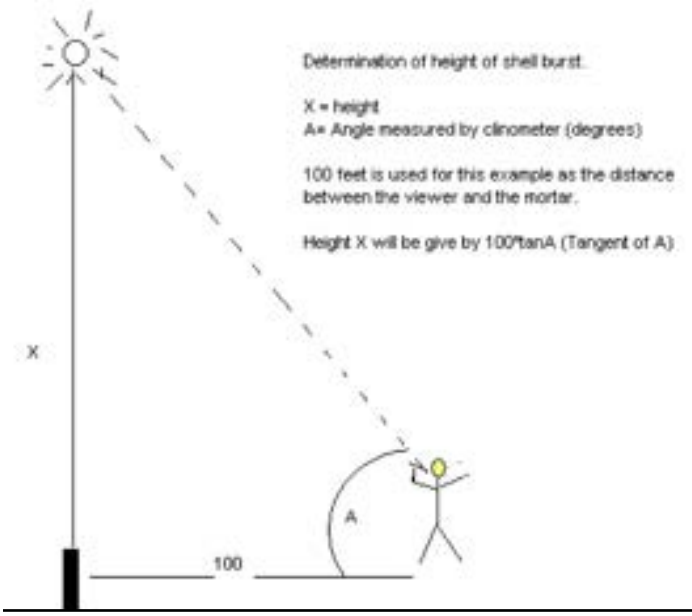
The clinometers is easy to make using paper, cardboard, string and a paper tube such as from a roll of paper towels. The scale is made using a protractor.

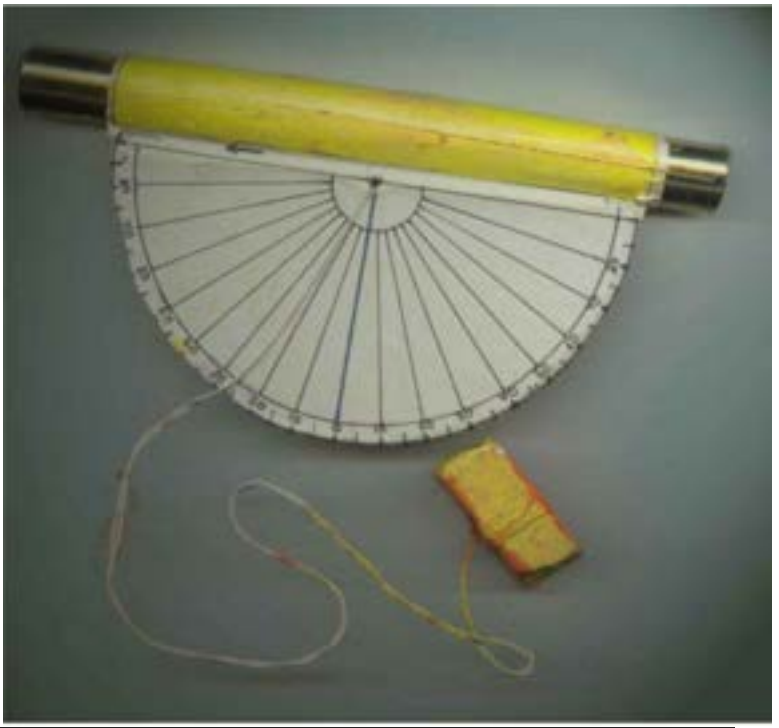
Tips for use:

1) Always use from a level location.

2) Shell drift will affect the measurement. Try this in a low wind situation.

3) There is a table of tangents by angles in degrees listed at the end of the article. You probably can't get 1 degree accuracy from your device, so the table is given in two degree increments.

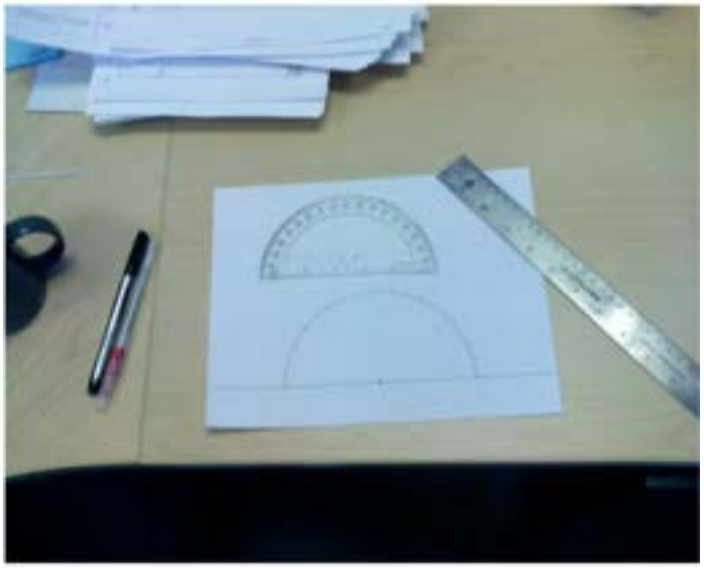




Trigonometry
(continued)

The steeper the angle, the worse your accuracy will be. Tangent values grow quickly as the angle grows, so the table stops at 55°. If you are finding angles larger than this, get further away from the mortar!

(Note: During my high power rocket days, we'd do with two clinometers, 90' apart from each other. We added the results and divided by two to get a SWAG about altitude. For those guys today, they put in altimeters as part of the payload but that would be expensive for pyro…)



°0	tangent
1	0.017455064928
3	0.052407779283
5	0.087488663526
7	0.122784560903
9	0.158384440325
11	0.194380309138
13	0.230868191126
15	0.267949192431
17	0.305730681459
19	0.344327613290
21	0.383864035035
23	0.424474816210
25	0.466307658155
27	0.509525449494
29	0.554309051453
31	0.600860619028
33	0.649407593198
35	0.700207538210
37	0.753554050103
39	0.809784033195
41	0.869286737816
43	0.932515086138
45	1.000000000000
47	1.072368710025
49	1.150368407221
51	1.234897156535
53	1.327044821620
55	1.428148006742



One of the nice things about Do It is the ability to continue manufacturing, even after open shooting has started—and even after it's dark. Constructive use of rope lights helps out quite a bit!

A Newbies First Do It
or
A Mine Is a Terrible Thing to Waste
by Mike Garrett

I had high personal expectations and a grand plan of action for my first Do It experience. Unfortunately, my high expectations were unrealistic and my grand plan was misguided for the real world. Don't get me wrong here, in the end I had a fabulous time and I intend to Do It again. Most importantly, I learned a lot that will serve me in the future. Please allow me to explain.

As the first day of Do It progressed it became very clear that I didn't have a realistic vision of what I could accomplish during the limited time. My only previous experience with manufacturing fireworks was a very modest effort at WWB 2011 last February. At that event I pressed a few stingers, built a shell at the shell seminar, and pounded a 1 lb. rocket at the rocket seminar. Everything worked more or less as advertised and for a first time builder of fireworks it was satisfying and a huge amount of fun. Enough so that it gave me a major case of the fireworks building itch. So I set about making my plan to manufacture fireworks at Do It. That plan had multiple flaws that were not apparent to the inexperienced newbie in me.

Before we go any further you need to know one thing about me. I don't do most things in my life half way. My wife and friends will attest that my personal motto always has been "If a little bit is good, too much is better". Back to my plan; I was going to make black powder rockets. One and two pound rockets seemed like a good idea. I would make BP on site, I have a hydraulic press, and I have the BP rocket tooling from Rich W. Rocket sticks were no problem as I have lots of lumber scraps laying around collecting termites. Headings … hmm … those are just shells without the lift cup, right? Easy enough, I thought. Keep in mind that I still haven't pressed a single motor on this new tooling and I have built exactly one shell in my life. This is where my "too much is better" style was starting to cause problems but I hadn't fully realized that, yet.

So what could possibly go wrong with a plan like that? Lets start with the fact that I didn't really have full appreciation of how long these things really take to finish. My BP plan included measuring out chemicals for one kilogram batches, screen mixing them, ball milling for four hours, wetting and ricing it through a 20 mesh screen, and finally drying. In theory you can do all of that in one day with the heat and low humidity of the desert. But you won't get any rocket motors pressed with that BP until the next morning. OK, I'll pick up a few of the pre-made Vulcan motors to make flyable rockets on the first day. Headings … that should not be a problem. After all, I had built one shell earlier at WWB. I had a roll of kraft paper, I bought stars from Flying Phoenix, and black powder from Beaver River. With the kraft paper, some glue, strapping tape, BP and the premade stars I should get some nice heading for these quick and dirty sky rockets. This was going to be instant gratification and creative glory, right? It didn't work that way.

The rockets flew straight, fast, and high but the heading were somewhere between lousy and horrible. The headings were simply too small and way too high in the air when they burst. The burst was very soft, actually more of a dump. It was like the rocket barfed out a few dozen teeny stars way the hell up there. The small crowd at the B Rocket line snickered quietly. It was totally underwhelming and very disappointing for me.

After that experience, I began to think about my entire plan again. Several issues had been gnawing at the back of my mind and now they were moving forward. But I still didn't see the big picture. For example I would be pressing rocket motors on new tooling with BP that hadn't been tested. Suddenly that part looked very risky to me. I knew I needed to test the motors without headings to dial them in. That would easily consume a full day and night and I only had two of each remaining. Those lousy headings needed to be addressed, too. Again I estimated a full day and night was the minimum time needed to get them working good enough. But wait, that's two days and nights which is all the time left at Do It. And I promised Blue something for the showcase. And I want some type of success at this event and not just experiments. Crap, this was much tougher than I thought. The big picture was beginning to focus and it wasn't pretty.

Sometime that evening my friend Gary said "why don't you make mines with what you already have?" At the time I didn't know much about mines so I kind of dismissed the idea. You know how most people are leery of the unknown? A bit later that evening I was talking with Todd and Phil about my problem. They mentioned mines as a possible solution, too. Again, I didn't really know what mines entailed so I still wasn't sure this was my solution. But I did note that I had received similar advice from two different experienced sources. About this time Lenny joined the conversation and it turns out he was making mines at his table. So I asked him a few questions about them and things began to click. I came to understand that mines were fairly easy to make (I don't want to say idiot proof because you know how cleaver us idiots are) and I had all the materials. This mine idea was looking like it had real promise.

OK, so what is a mine? A mine is about the simplest firework you can make that is shot out of a mortar. It blasts the lit stars (or other effects) upward out of a mortar in a cone shaped pattern and is good for filling in that layer of sky between the ground and the lowest level of shells. I estimate my 3" mines did a good job of attaining 75 to 125 feet in the air depending on the star/effect size. The mines I made consisted of a BP lift charge, stars/effects, a kraft paper and tape bag to hold it all together, quick match to ignite the lift and effects, and about 6 seconds of visco to give me a chance to get out of Dodge. See the figure for a better description of a typical mine.

On Friday I built 6 of these mines with variations to test the idea out. Much to my pleasant surprise they all worked pretty well that evening. Minor tweaking was all that was needed to make something good enough for the showcase pieces that I promised to Blue. They weren't going to be world class pieces but more important they weren't total garbage either. Besides being quick and easy to make, each 3" mine consumes about the same amount of stars as a 4" round shell. I could easily use all of these precious stars and none would be wasted in the burn pit.

Shortly after 3pm on Saturday I handed my completed pieces to Blue and went back to my area to break camp and pack up the truck. By 5pm I was packed and ready for my safety duty shift and completely ready to relax and watch the evening fireworks after that. Both the Members Showcase and Armageddon were fantastic displays. Best of all for me, my mines looked like they belonged in there with the other fireworks. Do It was a total success from my point of view.

Gary, I should have listened to you from the beginning. Thanks to Gary, Todd, Phil, Lenny, and Blue for making my Do It experience a positive one.

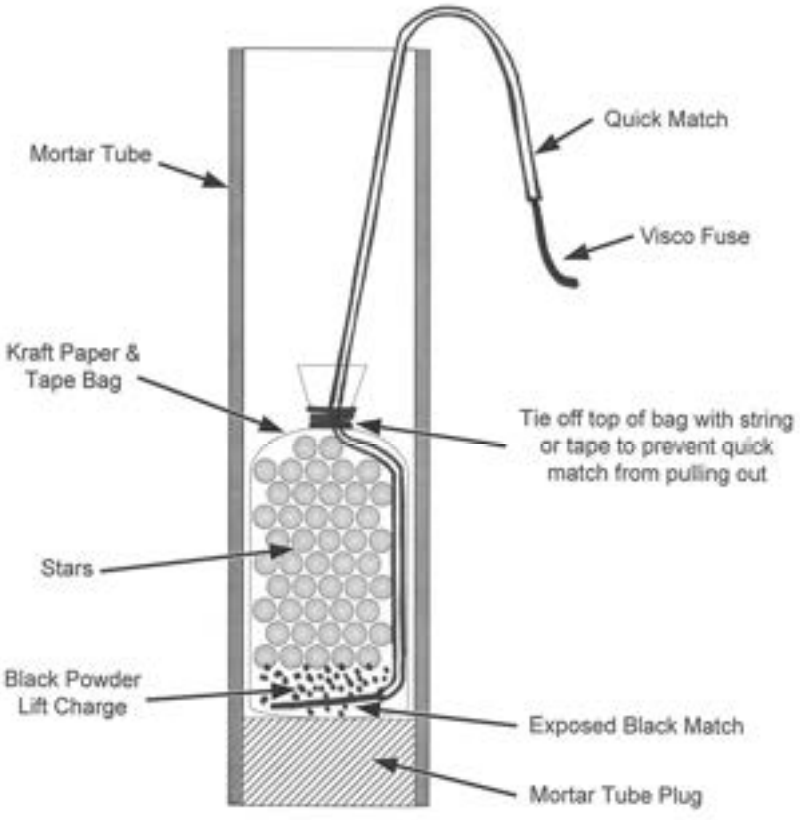


Figure 1. Basic Mine Bag Construction

A Collection of Star Formulas

by K.L. and B.J. Kosanke

Used by permission by K.L. and B.J. Kosanke
Originally appeared in Pyrotechnics Guild International Bulletin, No. 77 (1991)

At one time, we were engaged in the commercial manufacture of stars. During that time we assembled (developed, borrowed or modified) a series of star formulations. It was felt that the formulations were reasonably safe and cost effective, while at the same time, performed well (relatively easy ignition and fairly good color or comet effects). Over the years, when asked for advise concerning useful star formulations, we frequently supplied copies of these formulations. In the thought that there are others that might wish to have access to them, this short article has been assembled.

Following are the formulations, given in parts by weight. Unless otherwise noted, water was the solvent used to activate the binder. Normally round stars were manufactured in a star rolling machine. However, the formulations should work equally well to make cut or pressed stars. Where needed, notes have been included for clarity.

Table 1. Color Star Formulations.

Chemical	Red	Blue	Purple	Green	Red Strobe	White Strobe	Green Strobe
Potassium perchlorate	68	61	61	—	—	—	—
Ammonium perchlorate	—	—	—	—	34	—	—
Barium nitrate	—	—	—	56	—	53	49
Copper carbonate	—	12	5	—	—	—	—
Strontium carbonate	13	—	8	—	15	—	—
Sulfur	—	—	—	9	24	23	18
Parlon	—	13	12	14	—	—	—
Hexachlorobenzene	—	—	—	—	5	—	6
Red gum	14	9	9	3	—	—	—
Mg/Al (60 mesh)	—	—	—	—	12	12	11
Mg/Al (200 mesh)	—	—	—	4	—	6	9
Aluminum (12 mic., atom.)	—	—	—	9	—	—	—
Dextrin	5	5	5	4	5	5	5
Boric acid	—	—	—	1	—	0.5	0.5
Potassium dichromate	0.5	—	—	—	5	2	2
Notes:					(A)	(B & C)	(B & C)
References:		(1)	(1)			(2)	(2)

Notes:

(A) Do not prime with meal prime, use only red strobe prime.

(B) Adjust strobe rate by using greater or lesser amounts of Mg/Al (200 mesh).

(C) Priming consisted of a very heavy application of meal prime (30-50% of total star weight).

Table 2. Prime and Comet Formulations.

		Red					
	Meal	Strobe		Gold	Soft	Bright	
Chemical	Prime	Prime	Willow	Glitter	Silver	Silver	Pearl
Potassium perchlorate	—	68	—	—	—	—	—
Potassium nitrate	75	—	64	55	50	64	35
Barium nitrate	—	—	—	—	10	—	—
Charcoal (air float)	15	18	13	11	10	13	15
Charcoal (80 mesh)	—	—	9	—	—	—	—
Zinc dust	—	—	—	—	—	—	40
Aluminum (12 mic.,atom.)	—	—	—	5	—	—	—
Aluminum (50-120 mesh)	—	—	—	—	10	—	—
Titanium (20-40 mesh)	—	—	—	—	—	9	—
Red gum	—	9	—	—	—	—	—
Sulfur	10	—	9	17	15	9	5
Dextrin	5	4	5	5	5	5	5
Potassium dichromate	—	1	—	—	—	—	—
Sodium bicarbonate	—	—	—	7	—	—	—
Notes:	(D)	(D)					
References:				(3)	(4)		

Notes:
(D) Can also be mixed with nitrocellulose lacquer for use as a quick drying slurry prime.

References

1. T. Shimizu, "Studies on Blue and Purple Flame Compositions Made with Potassium Perchlorate," *Pyrotechnica VI*, 1980.
2. R. Winokur, Private communication.
3. T. Fish, "Glitter Stars without Antimony," *PGI Bulletin,* No. 24, 1981.
4. R. Sheard and others, Private communication.





Faces of Do It!

Random 'mug' shots at Do It 2011



A Note About the Cover

by Tom Calderwood

The cover is a conglomeration of different images from Do It. One of the problems I've run across is when good cameras go bad. My preferred camera had to go to the shop about a week before Do It. (I'll fess up—I dropped it and absolutely messed up the lens. Camera came through a lot better than I thought.) That meant I had to use an older camera that still shoots a very respectable pyro image, but it was like trying to learn to use another camera all over again.

All the stuff you see has been composited in there, but I bet Bill McGregor is thinking "Mines and fireballs. Hmmmmm." But that is one of those effects that would look good live but lousy on camera. Has to do with shutter speed and f/stops.

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Who is THAT??!?

Photos by Mike Garrett

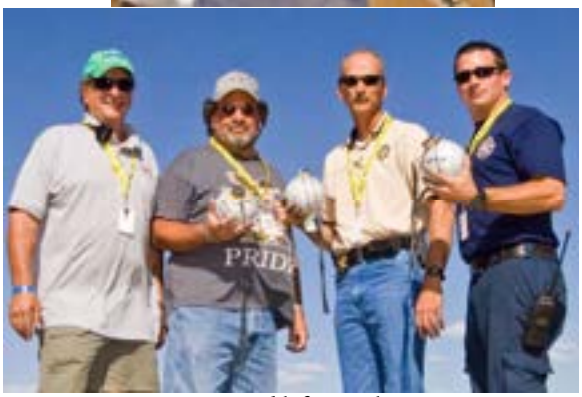
Mike Garrett was able to catch some folks building shells. THIS is one of the reasons why we love Hawthorne, NV. Richard Haase is showing three of the Mineral County officials how to build a pyrotechnic shell. Under Richards guidance they each built one shell and fired it on Saturday evening. I'll leave the story telling of shooting the shells to Richard for a future After Glow or git-together at Mud Sharks.













Pictured left to right:
Richard Haase, Craig Nixon (retired Mineral County Fire Chief), Mike Dillard (Mineral County Sheriff), J.T. Knight (current Mineral county Fire Chief)
Thanks guys! You did a good job!

$3 Per Pound Black Powder For Sale!

By Peter Shoewe

(NOTE: The sale of all black powder (including gunpowder) is regulated by law in at least six states. You are advised to check your local and state laws regarding the purchase and possession of such products before ordering or possessing)

Here's a list of places we can get black powder at 25 or 50 lbs shipped to our house.

Crater Fireworks $3 per pound BP includes $2 per can. It comes in 22 or 44 lbs per case, although he may make it an even 25 or 50lb. If you're nearby and pick it up yourself then its only $1 per pound. This BP is called "116 fuse". Made by the Elephant Company in Brazil, which was bought by the Diamondback powder company. Jon told me in his club they've used it for lifting shells up to 6". They just needed to add a bit more powder. It has the particle size of sand. This is a onetime deal. Only about a 6 month supply left and then it will be gone. His other powders are $9.50 per pound unless you pick it up in person then it's less. Crater Fireworks also sells Time fuse, Thermolite, Visco, Wano, Diamond Back, Schutzen and Swiss. Under Meal D, for example it says $5 per lb at 25. or 50lb bags, you'll need to add $2 per lb for the can plus around $57 for shipping a box http://addictedtoblackpowder.com in Illinois.

Apparently the Kik company is closed as of 2009 and appears will not go back in business. A short recent history of the plant and ways black powder is tested www.laflinandrand.com/madmonk/KIK.pdf (This PDF is 1.38mb in size, and may take up to 5 minutes to open.)

WWW.GOEXPOWDER.COM The Goex factory had 1,000 lbs of BP blow up in Jun of this year 2011. They plan to be running soon. Short story at this site. http://www.ktbs.com/news/28155035/detail.html

WWW.GRAFS.COM $12 lb plus shipping. For Reenactors powder. Reenactors powder is a mix of 1FG, 2FG and 3FG, but contains mostly 1 and 2FG. Normally used in noise canons. Some have used it in shotguns.

WWW.POWDERINC.COM Goex, Swiss, Diamondback, Pyrodex. $262.50 for 25lbs of Skirmish Reenactors powder, including shipping. Goex costs $355 including shipping. Skirmish BP is made by Goex for Powdeinc. 877-833-1799

WWW.MAINEPOWDERHOUSE.COM Reenactors powder $327 for 25lbs includes shipping

WWW.WANO.DE See a BP mill in action.

At this Skylighter site we see mesh vs. microns with some info about black powder in general.
http://www.skylighter.com/skylighter_info_pages/article.asp?Item=47#mesh

Here is a side by side comparison of Goex vs. KIK powder.
www.norwestcompany.com/comparison.htm







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