

# Western Pyrotechnic Association Newsletter

Winter 2014, Vol 25-2





# FLYING PHOENIX FIREWORKS

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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.



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Cover Picture: Large (1 inch) pumped stars on drying tray - Mike Garrett



## 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

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# 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.



# *The Secretary Writes*

Hi Everyone –

I hope you all had a great Thanksgiving and preparations for the winter Holidays are DONE! (Read – NO shopping on 12/24!)

Anyway, I cannot believe it's almost been a year since you've all so graciously elected me as your Club Secretary. A lot has happened in this past year both personally and within the Club. Personally, I've taken a new position still within the mortgage industry, and Bea and I are in the process of moving to Colorado. We've already closed on the new home in Castle Rock, CO and are in the process of selling the home in California.

For the Club, I think we have made great strides where we are headed. We have a GREAT BOD (not to mention GREAT members that elected us!) that is making what I think is significant progress on improving how we operate as a Club. To date, some of my best efforts to help move the Club forward have been mostly within the BOD operations. We are very productive with our meetings, and we've changed our conference call services to allow for online collaboration as well as as-needed conference calls – all the while still saving the club money. We've also made strides in being more transparent with how we conduct Club business – as well as running events. Being stewards of the Club's operations, assets, and reputation are paramount to what we are trying to accomplish – all the while trying to increase membership and positive Club exposure.

I hope to see you all at Winter Blast 26 – this time however, from the Registration Desk!

Your Secretary,  
**Dennis Miele**



A couple of 16 inch shells

# Communications VP Proposal

Maybe some of you have noticed that the world isn't quite the same as it used to be 25 years ago - especially relative to technology. When the WPA was formed, there was no internet, no cell phones and mail was delivered by the postman. The original 5 officer positions were established given the tasks at hand in running the business of the club, relatively equally distributed among the whole board.

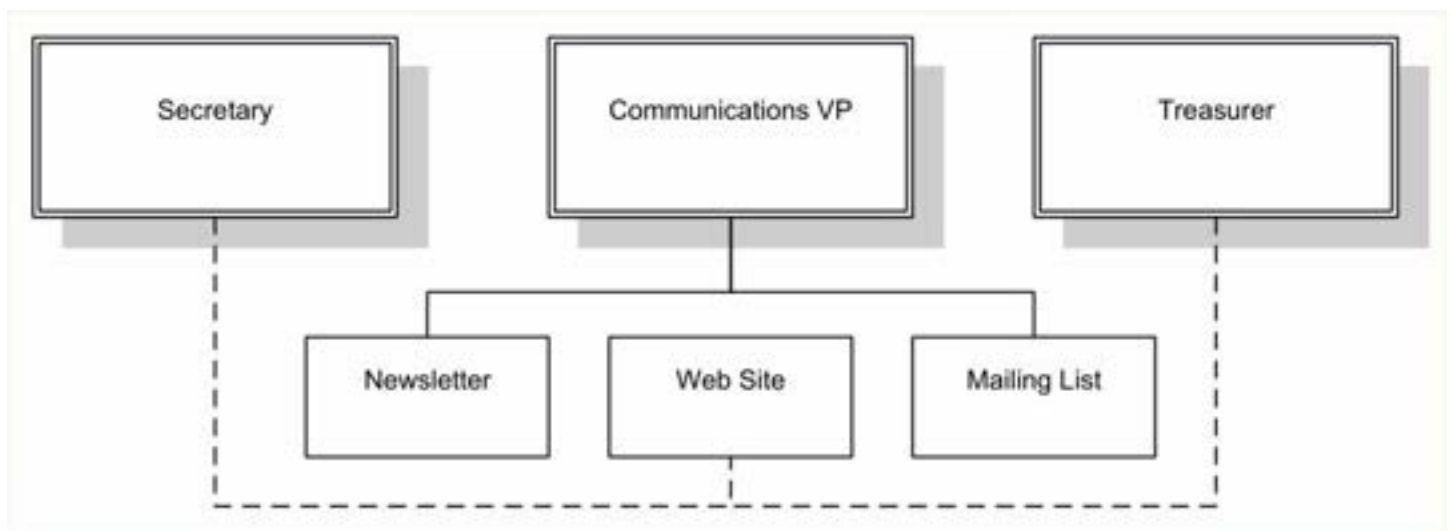
But things have changed a bit. We now have an website, an newsletter that is primarily done in downloadable version, and we have a online mailing list that keeps us informed. We also have a more sophisticated method of membership renewal and registration for our annual events. This all takes a bit more administration then 25 years ago.

The position on Publications VP has become a little convoluted and there are some new duties needing administration that don't quite fall under a particular title any more. Give this, I'd like to propose a change in of the board positions - Change the title "Publications Vice President" to "Communications Vice President." The newly titled officer would then be in charge of more than just the newsletter. Add to his position the administration of the WPA Website and the WPA Mailing List. This can be done by delegating or hiring any or all of those services to other individuals, recognizing that it may be too much for one person to do all three things.

That said, I will be adding this item to the agenda at the WPA's annual business meeting come February at the Winter Blast. There is time between now and then to discuss the proposal and refine it. In reality, we are already functioning this way to a large degree, in that Pete Hand is doing the Newsletter, John Noonan running the website (and a whole lot more) and Kevin Bollinger is the Mailing List administrator, which is a stipended position. Thus changing the title mostly puts all three duties under one person to oversee.

Steve Wilson

## Proposed ORG chart





# WPA Web Site FAQ

The new WPA web site has been up and running for about a year now. It has gone through a number of changes within the past year, and we've received a good amount of feedback. A number of questions have come up repeatedly. Here are some of them.

**Q: Why can't a new member join online?**

*A: For a person to join the WPA, they must meet certain qualifications that need to be verified first. (See membership policies or membership form for these details.) Once we verify their info, we set up the membership. Sometime in the future, we will be able to have "pending" memberships online, which we will review and approve online.*

**Q: Why do I need this stupid "authentication token" to register or renew online?**

*A: Before you can renew your membership or register for an event online, you must "register" on the web site. This creates your login info and links you to your own information. The token (or code) is different for each person, and by using the unique code we send you, you will be matched with your own info.*

**Q: How do I get my authentication token?**

*A: It's provided in three ways: 1) On the cover letter mailed with your new membership card every year, 2) In the welcome email sent to every new member, and 3) by contacting Dennis Miele or John Noonan if you prefer: [dennis@westernpyro.org](mailto:dennis@westernpyro.org) or [john@westernpyro.org](mailto:john@westernpyro.org).*

**Q: If I have my authentication token, why do I still need to respond to a verification email? Why do I have to jump through so many hoops?**

*A: These hoops are to help protect your information, and also to validate your email address when you set up your online account.*

**Q: Do I need a login account to access the newsletter or event info?**

*A: No. But there are "members only" areas that provide additional information if you are logged in and your membership is current. For example, we don't want to publicly share hotel discount codes.*

**Q: How do I register my spouse or child for an event?**

*A: When you are logged in, look for the section on family members in your profile. Follow the instructions to set up family members, then when you go to the event registration page, they will be listed and you can choose who you want to register for the event.*

**Q: Can I renew my spouse's membership while I am logged in?**

*A: No. You can only renew your own membership.*

**Q: Can a husband and wife both login with the same email address?**

*A: No. Since your email address is your user name. People in this situation will need to download and use paper forms.*

**Q: Why do new features take so long to be added to the web site?**

*A: In a nutshell, it takes time, and sometimes money. With the WPA's limited resources, other priorities sometimes prevail.*

**Q: Who is actually doing the work on the web site?**

*A: Two people: John Noonan handles the overall effort and works with the board of directors to set priorities and budget. There is also significant effort involved to clarify and revise club policies that are inconsistent or unclear. Then he works with our software developer to implement and test the required features.*

**Q: There are lots of ways to create free or cheap web sites. Why aren't we doing that?**

*A: We looked at a lot of these, but the only way to get what we really need is to build it ourselves. We are using a modern development framework known as Ruby on Rails.*

**Q: How is my credit card or other personal info protected?**

*A: You can read all the details in our online privacy policy at [www.westernpyro.org/privacy](http://www.westernpyro.org/privacy). In a nutshell, everything is encrypted, credit card info is not stored, and we do not share your info with anyone outside of the WPA.*

**Q: Sometimes I have trouble accessing the web site. Sometimes I get a message that it is not a secure link like it is supposed to be. What's the deal?**

*A: The most common cause is stale information in your web browser cache. Clear your browser data and try again.*

**Q: Why can't I pay for RV parking or other things, such as donations, with my credit card online?**

*A: It's just a matter of priorities when having limited resources to set up stuff like this.*

**Q: What if I want to learn more?**

*A: Drop an email to Dennis Miele at [Dennis@westernpyro.org](mailto:Dennis@westernpyro.org) or John Noonan at [john@westernpyro.org](mailto:john@westernpyro.org).*



# *Congratulations!*

**Lonnie and Aubrie Ross were married on October 10<sup>th</sup>.**



# *Congratulations!*

**Mason and Shelby Jensen were married on May 16th**





# DO IT' 2014



DO IT this year was a little - challenging - this year. The event started with howling wind that blew away several popups, and ended with a day of steady rain that turned the event site into a morass of slippery mud that even 4x4s had trouble negotiating. In the middle, we had one perfect day.

As you can see from the picture above, the manufacturing area was a good deal less crowded than usual, especially after the winds had cleared out half the tents - note the wreckage just left of center. However, rockets were pressed, stars were rolled, shells and mines were made, and the Member Showcase was quite impressive.

Unfortunately, Dave Ferguson's record breaking rocket had to be assembled and launched off site, for reasons of liability, but it's probably just as well - after Saturday's rains it might not have been possible to haul it over the track banking to the launch site.

We braved the weather for the Afterglows most nights, but everyone was very grateful when the El Capitan put a meeting room at our disposal for a very cold, wet Saturday night.



Your Board of Directors at work - Greg and Steve cutting wood for mortar racks, Do It 2014





## New member Cliff Pearson pounds his first rocket



## Fashionable Rainwear



## Stars, rockets and a shell





The BFR takes off .....

And a few seconds later its 16 inch header bursts





Saturday night's Afterglow was held at the El Capitan



Enthusiastic new members

# Blackfinger's Workshop

In the last newsletter I gave a brief outline on how to make inserts for shells. This time I want to tackle stars. It's very convenient to be able to buy them at events from Flying Phoenix and AM Pyro, but those sources may not always be available, and besides - there are many other kinds of stars apart from the ones they stock. The accomplished pyrotechnist is an artist, and should have available the full palette of colors and effects to make that perfect shell.

There are three basic ways to form stars. Each has its own merits and disadvantages. You can cut them, forming cubes; you can pump them, forming cylinders; and you can roll them, forming spherical stars. Most stars can be made in any of these three ways, but some can only be cut, and some can only be rolled.

Cut stars need no special equipment. After mixing the compound and damping it until it has the consistency of pastry dough, you roll it out in a patty on a sheet of waxed paper and cut it into strips with a knife, then cross cut the strips into squares. I started out making my stars that way, and still do quite often. It's quick and easy. The disadvantage is that unless you're very careful, the stars don't come out very consistent. I tend to cut the strips inconsistently so that some are wider than others.

Pumped stars are extremely consistent, but need some investment in tooling. Basically, a pumped star is made by filling a tube with damped composition and pressing it into a solid cylinder with a ram. You can do this one at a time, if you have unlimited leisure, or you can make or buy a star plate. These can be very expensive, like the Wolter star plate below left, or just expensive, like the Chinese star plate on the right. Personally I own the Chinese version. It looks rough and ready and it is, but it does the job quite adequately. All the stars come out the same size and shape every time.



Rolled stars are the nice spherical ones like the stars that you buy from Flying Phoenix. I have heard that some extremely patient people can make these without a machine, but most people use a roller. In the simplest form, this is just a 5 gallon bucket on a stand with a motor to turn it. Other people use a more sophisticated rolling tub, or even a cement mixer. The principle is to start with small spherical cores - #8 bird shot is popular - rolling in the tub, and build up successive coats of star compound by damping the cores and adding powder so that they grow like snowballs. The great advantage of this method is that you can make 10,000 stars as quickly as you can make 100. The disadvantage is that

for small quantities, it takes longer than pumping and cutting, and the stars don't all come out the same size so they need sorting after.



I have no idea where you buy a star roller, but they are a popular do-it-yourself project, like these two spotted at Do It. I have some doubt whether it's a good idea to use electric drills to drive them, given that electric drills have notoriously sparky motors and stars make inflammable dust, but they are a very convenient source of motive power.

There's definitely a skill to rolling stars, one that I have not mastered myself. Anyone interested in learning the craft will find helpful folk willing to show them how it's done, in the manufacturing area at Winter Blast or Do It.

## Types of Star

Stars come in two basic families - those with tails, and those without. The tailed varieties include the various types of charcoal streamer and the silver and gold glitters. Colored stars generally don't have tails.

The best known "system" of colored stars was developed by our own member Robert Veline. It uses a conveniently small selection of chemicals and can produce all the colors, both primary and mixed. The Veline system, as originally published, is reproduced on the next page.

I have a few personal observations on the Veline system.

The brightness and color balance of Veline stars is very well matched. You can mix colors in the same shell and one will not overpower another. I found Veline Green stars quite difficult to light, and slow burning. They would not come out of the burst alight, but lit up after some delay, which was rather a strange effect. Also the Veline Super Prime is a bit complicated. It uses the toxic potassium dichromate and contains magnalium, which causes a white flare at the initial burst and subtracts somewhat from the colors. I prefer a different hot prime, which I'll describe later.



## A Compatible Star Formula System for Color Mixing

By Robert Veline

	Red	Orange	Green	Blue	Super Prime
Strontium carbonate	15				
Calcium carbonate		15			
Barium carbonate			15		
Copper oxide, black				15	
Barium nitrate			24		
Potassium perchlorate	55	55	30	55	55
Parlon	15	15	15	15	
Red gum	9	9	5	9	
Magnalium					
(50/50 -200 mesh)	6	6	11	6	5
Dextrin	+4	+4	+4	+4	4
Charcoal, airfloat				20	
Wood meal, -70 mesh					6
Iron oxide, red					5
Potassium dichromate					5

### A Few Notes About These Formulae

The numbers are in percent by weight. The potassium perchlorate is a fine powder. The Swedish stuff is what I used. The parlon was Hercules brand, but Superchlone brand from Ishihara Co. Ltd. also works. Nothing special about the red gum, just fine powder. The best barium and strontium carbonates are obtained from Barium and Chemicals of Steubenville Ohio. The calcium carbonate was -200 mesh 'Whiting'. Copper carbonate may be used rather than black copper oxide without much change in performance. I have tried finer more pure forms and found they have slowed the burn rate, and degraded the color... Note that all of the proportions are the same for the different colors, the exception being the green. The idea is to have as many characteristics, burn rate, brightness, flame size, color purity, and density of powder, common between the different powders, as is possible. While these formulas do not excel in any one characteristic, they are all part of a matched set. The green: I was unable to get a suitable green star for this family without using barium nitrate. So, in order to compensate for the reduced oxidizing ability of the nitrate, a more energetic fuel mixture was used.

### Now the Fun Stuff:

YELLOW	55 green	45 orange	
CHARTREUSE	80 green	20 orange	
AQUA	80 green	20 blue	
TURQUOISE	55 green	45 blue	
MAGENTA	50 red	50 blue	
MAROON	85 red	15 blue	
PEACH	60 orange	25 red	15 blue
PURPLE	5 orange	15 red	80 blue

Copyright: Robert Veline

Well, that's it! These stars are the results of a couple of years of hard work, they are offered as some form of repayment to the many people who published information which I have feasted on all these years. THANK YOU!!!! - Robert Veline II

## Tailed Stars and Glitters

These are Pete Hand's personal favorites. They are each quite different. All parts are by weight.

### Charcoal Tailed Stars

	<u>"C6"</u>	<u>"C8"</u>	<u>"Tiger Tail"</u>	<u>"Willow"</u>
Potassium Nitrate	55	49	44	35
Sulfur	7	6	6	12
Air Float Charcoal	33	40	44	45
Dextrin	5	5	6	8

Charcoal stars should be mixed quite wet with water, so that the nitrate soaks into the charcoal. The mix can be left to dry out for a while until it's the right consistency to cut or pump. If these stars are rolled, the rolling process makes them wet enough. Charcoal stars take a long time to dry, and it's not really feasible to make them at a 3 day event unless the weather is hot and dry.

### D1 Glitter

Potassium nitrate	53
Sulfur	18
Airfloat charcoal	11
Aluminum, atomized	7
Sodium bicarbonate	7
Dextrin	4

Damp this composition sparingly, as over-wetting spoils the effect. A bright silver glittering tail. The aluminum is 325 mesh atomized, *not* flake - for example, Skylighter CH0103

### Bleser's Blonde Streamer

Potassium Nitrate	45
Charcoal	29
Sulfur	6
Ferrotitanium	15
Dextrin	5

A rich yellowish tail from the iron in ferrotitanium. Use Skylighter CH8112. If you replace the ferro-ti with titanium it gives a thick brilliant white tail.

### Gold Glitter

Potassium nitrate	53
Sulfur	7
Airfloat charcoal	11
Antimony sulfide	8
Aluminum, 325 mesh	7
Sodium oxalate	10
Dextrin	4

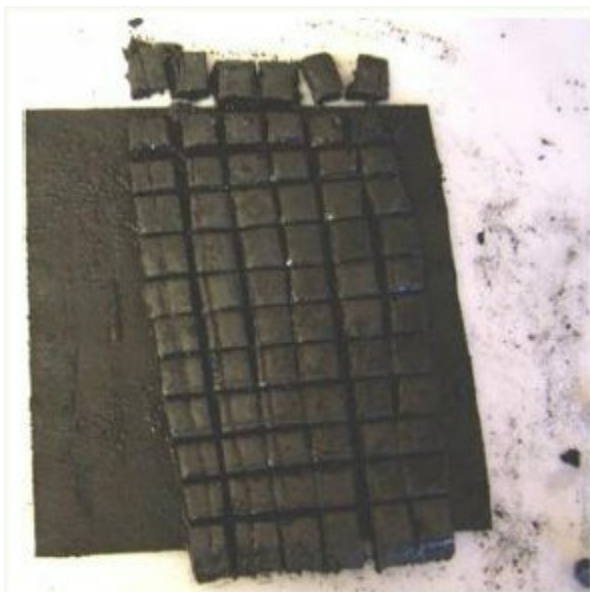
My favorite glitter star. Brilliant gold flashes. Flake or atomized aluminum works. Antimony sulfide can be Chinese needle or dark pyro.

### Hot Prime

Potassium Nitrate	40
Black Powder	40
Silicon	10
Dextrin	+5

This prime makes a sticky hot glass from the burning silicon that will light anything, including the troublesome Veline Green. It's suitable for all the stars listed here. The black powder can be commercial Meal D or your own home made. It doesn't have to be a fast powder. If you use home made, use the dust straight from the mill without granulating.

All the above star formulas are bound with dextrin and water. Mix the dry ingredients by passing them several times through a 20 to 40 mesh screen. It is good practice to use a dust mask and rubber gloves. Most of the ingredients are harmless, but barium and antimony are somewhat toxic and you don't want to inhale the dust. When the ingredients are thoroughly mixed, put them in a bowl and spritz with water from a spray bottle until the composition holds together in a lump when you squeeze it in your hand. You will need a little more water if you plan to cut the stars than if you plan to pump them.



To make cut stars, squeeze the damp composition into a tight lump, then press it on waxed paper into a square patty about 3/16 inch thick. Spread hot prime over the top of the patty. Then, with a long sharp knife, cut into strips about 3/16 inch wide. Press down with the knife, do not pull it. Then cut across the patty again to divide it into squares. The prime is helpful in keeping the strips and squares from sticking back together.

When all is cut, pour a generous measure of prime into a bowl, then pick up the stars on the wax paper and drop them into the bowl. Swirl them about to make sure they are well coated. Then use a coarse screen to separate them from the loose prime and set them outside in a shady place to dry. When they are properly dried they will be quite hard, impossible to crush. The leftover prime can be reused.

Pumped stars need somewhat less water - the composition should be the consistency of damp sand. Fill the cavities of the star plate to the top with loose composition, insert the ram plate and press. How much pressure is enough? I go to about 100psi, which conveniently enough happens to be my body weight divided by the area of the pins in my Chinese star plate. In other words, I lean on the plate with my whole weight. You can also use an arbor press. After a few seconds of dwell to consolidate the stars properly, eject them into a bowl of prime, swirl around to coat them and set them out to dry.

The size of star depends on the size of shell you plan to put it in. The stars in consumer shells are quite small - 1/4 inch and under - to burn out quickly at a low height. For 3 and 4 inch shells, 3/8 inch is a good size. If you're making bigger shells, you don't need my advice.

### Screen Cut Rubber Stars

This is a relatively new approach to colored star making. Rather than binding the stars with dextrin and water, it takes advantage of the fact that Parlon (chlorinated rubber) dissolves in acetone. The dry mix (less the dextrin) is placed in a plastic bag and sufficient acetone added to form a patty of similar texture to the cut star patty, though very sticky. This is patted out on a sheet of waxed paper, liberally dusted with prime, and then forced through a 2 mesh or 3 mesh screen to cut it into squares, which fall into a bowl of prime to stop them sticking back together. The advantage of this process is that the acetone evaporates so fast that the stars are hard and usable the same day, often within an hour. I tried this for the first time at Do It this year and was very satisfied with the outcome.

For full details, check out Ned Gorski's how-to article on Skylighter -

<http://www.skylighter.com/fireworks/how-to-make/red-rubber-stars.asp>



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