WPA

Western Pyrotechnic Association

Newsletter

Volume 11, Number 5 - October 2000

Instructions for Authors and Advertisers

The WPA Newsletter is published quarterly by the Western Pyrotechnic Association, Inc. Articles submitted to the Newsletter may be on any topic of potential interest to WPA members. The Newsletter Staff will do their best to publish any reasonable manuscript submitted by WPA members. Electronic submissions of manuscripts is strongly preferred. Guidelines for preparing manuscripts appear in the first issue each year. If you have an article, advertisement, or other information you wish to submit to the Newsletter, please send the material to:

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Hawaii - No representative available
Holding own elections

From the President

by Kief Adler

Welcome to the pre-Do It by the River issue of the WPA's newsletter. In this, our second year of Do It, I hope to greet many of you in person at this great event. Although not the grand event that WinterBlast has come to be, Do It is a great event for learning and practicing the art of pyrotechnics and getting together again with your WPA family. Your Board and the Do It staff has been hard at work to make this another great time spent pursuing the hobby we all love. The schedule of events can be found elsewhere in this newsletter so schedule your time so that you can attend as many of the seminars as possible.

Also in this issue you will find a copy of the WinterBlast comp guidelines proposed by the WinterBlast chairs. The Board of Directors has approved these guidelines as you see them. For the first time in our history, we have a written set of guidelines that has been approved by the Board and will be available for discussion and voting by the members at our general meeting in February of 2001.

Speaking of WinterBlast, registration forms, along with membership renewals, will be sent out to all members under separate cover in November. I have spent many hours working with the Lake Havasu Tourist Bureau, as well as the individual hotels, to ensure fair prices for our members. This year, the Tourist Bureau will handle all of our hotel reservations directly. By booking directly through them, you will be guaranteed that the written price is the one that you will be paying. You will only be able to book these reservations via fax or mail so please get your hotel requests in as soon as possible. I would also like to announce that, for the next WinterBlast, we will be receiving $15,000 from the City, and not the $8,000 that we have been receiving. This is a major accomplishment for the club and one that will help us make the next WinterBlast better than ever!

At the Board meeting in September, Dimitri Timohovich was unanimously voted on to the Board as Vice President of Publications, filling the vacancy left by the resignation of Frank Feher. We all welcome Dimitri to the Board and wish him continued success in his efforts to produce our newsletters.

Speaking of the Board, I want all of you to know what an honor it is to serve with such a great group of dedicated members. I have found their input and advise on club matters to be intelligent and meaningful at all times. Their counsel has been both prudent and wise on several issues of great importance to the club. My thanks goes out to each and every one of them.

In ending this letter, I want to remind you to support the WPA, not only by attending our events, but by volunteering to help with the events. The WPA is much more than a Board of Directors and only you can help make it so.

See you at Do It!

From the Newsletter Committee Chair

by Dimitri Timohovich

Welcome to the third WPA newsletter for 2000. I, as well as all the committee members, hope all our members enjoy and learn from it. First and foremost, I want to personally thank everyone who has contributed to this issue, The BOD, Warren Klofkorn, Steve Majdali, Mike Workman, our advertisers, and Bonnie and Ken Kosanke. I especially want to thank Irene Allen for her hard work in putting this newsletter from all the bits and pieces I've been sending to her. Again, thanks to all who made another issue possible.

I have a favor to ask of our members. After you read this issue, please drop me an e-mail on how we are doing, your feedback is very important to us. It will let this committee know what you want to see in future issues. Our goal is to provide a quality newsletter with information that is of interest to all members. We are still exploring options for color covers as well as a color photos with the articles. We are doing some changes in order to be able to produce color issues at a reasonable cost. We hope to have these changes in place by the new year.

Thank you and enjoy

P.S. If anyone has any questions or comments (good or bad) about this issue or if you would like to submit an article for future publication, please email me at rvtemt@yahoo.com.

Just As A Side Note

I look forward to seeing all you Do It participants this year. We will have a small, intimate group and that promises to be a lot of fun for all.

I also want to announce that after must research and deliberation, a firing system has been chosen for the WPA. I am proud to announce that Pyromate will be the official firing system of the WPA. Student shells, and other items will now be fired electrically, in order to prevent any injuries that could happen from hand firing these devices. I want to thank Rein and Nancy Beuwkes for their generous donation and to Pyromate for supplying the system. Make sure when you see these folks, give them a great big "Thanks" for their contribution to the club.

From the Vice President

by Mike Workman

For those of you who attended the PGI Convention in Fargo this year, I am positive you will join me in a "salute" to the MPAG group who put on Wednesday nights feature show. It was the best show I have ever seen. I thought I would never see a show where the producers didn't step on the Willow shells, or recoil from any dark sky. I must say, the Michigan gang did a spectacular job. My ardent wish is that the WPA could muster the energy and time to put together a show for a PGI convention. For me personally, and some of my fellow WPA pyro's, this day will have to wait until we get a legal manufacturing setup. Although much of what the MPAG guys shot was bought, they filled the show with over 300 mines and 250 comets that they themselves made. The comets were 3" charcoal and aluminum tail. While the charcoal tail was the standard long lasting bushy style, the aluminum was anything but standard: It "drooled" out of the tail (the comets were fired at angles in cris-crossing paths). In fact, the comet tails looked like orange bushy garlands with bright white tinsel draped over them. Awesome.

So for all of you who will again make product someday, let's have a meeting at the Do It by the River over a beer and chat about the show we would like to produce. Whatchya think? If you like the idea, send me an email and we'll get up a list of interested folks.

I look forward to seeing some of you at the Do It event in October. Until then, everybody stay safe.

* * *

From the Secretary

by Keath Nupuf

I'm looking forward to lighting a fuse with my fellow members of the WPA at Do It by the River. If you see Miki and myself around, please stop and introduce yourself so we can put a face to the name and voice. Let's make sure to be safe and alert, and have a blast.

For all the members that can't make it to this event, we will be posting pictures on the WPA website nightly. The location will be:

http://wpa.pyro.org/doit2000
Login: members
Password: hands-on

This page will not be online till 10-10-2000.

From the Treasurer

by Kathy Baird

This report does not reflect any of the September income or expenses. So watch for the next edition of your wonderful WPA newsletter for the thrilling Do-it money report. We can all hardly wait I am sure. Personally, I am tuning up the old adding machine because it will not be long before that time of the year rolls around once more. Yes, you guessed it, membership renewals will be happening soon.

Until then, The ol' numbers runner herself,
Kathy

TREASURER'S REPORT

July 1 to August 31, 2000

Income		----
Expenses		
Convention:		
Reimb. Registration WWB2000	$ 119.00	
Deposit for flee market sight	500.00	
Security WWB2000	2,784.00	
Total Convention		$3,403.00
General Operations:		
Telephone	$ 129.89	
Misc	40.95	
State Taxes	10.00	
Accounting, Tax preparation	400.00	
Legal fees, Palmer case	2,686.81	
Printing and Postage	2,231.65	
Total General Operations:		5,499.30
Total Expenses		$8,902.30

Do It by the River

October 19-21, 2000

Avi Hotel and Casino, Laughlin, Nevada

Schedule of Events:

(all times in Nevada Time)

Thursday October 19th

9:00 - ?	Set-up until we're done. If you can give us a hand, meet at the Do It area across the river from the hotel
1:00 - 8:00	Registration
4:00	MANDATORY safety and welcome meeting
4:15 -10:00	Open shooting and vending
10:00 - Midnight	Afterglow

Friday, October 20th

9:30 -11	Registration
10:00 -12:00	Composite Motors, Part I
12:30 - 8:00	Registration
1:00 - 3:00	Whistle and BP rockets
3:00 - 5:00	Mortar rack construction
4:00 -	MANDATORY safety and welcome meeting
4:15 -10:0	Open shooting and vending
10:00 - Midnight	Afterglow

Saturday, October 21st

9:30 -11:00	Registration
10:00 -12:00	Composite Motors, part II
11:00 -12:00	Armageddon II: Class C Demo, lecture portion
1:00 - Showtime	Armageddon II continues - hands-on display set up
1:00 - 3:00	Round Shells
3:00 - 5:00	Stinger Missiles
4:00 -	MANDATORY safety and welcome meeting
4:15 -10	Open shooting
10:00 - Midnight	Afterglow

Sunday, October 22nd

9:00 - ?	Clean-up and pack up and move out.

See you at WWB 2001!!!!

1. Registration will be in the Do It area across the river from the hotel ONLY. If you will be arriving at a time when Registration will be closed, don't panic. Come to the Do It area and ask the friendly security guard to page someone to registration using his really cool radio and someone will open things up for you.
2. You must get a shooters wrist band, in addition to your badge, in order to shoot anything. These will be given to you once you sit through one of the safety meetings.
3. Afterglows will be on site following the end of open shooting.
4. A $5-10 materials fee may be charged for certain seminars. Check for further information at the Do It Registration area.
5. Your vendors are Firefox (for all your chemical needs) and Flash Fireworks (for all your C and B needs).
6. As a new addition to Do It this year, Flash Fireworks will be vending class B shells under the clubs ATF license. If you would like to purchase and shoot a shell, see Gary of Flash for details. Further information regarding class B sales and shooting will be available at our Mandatory meetings.

The seminars:

BP and Whistle Rockets - Chris Spurrell and Tom Calderwood.
Participants will be shown how to make BP and Whistle rockets and then given the opportunity to make one of their own. Learn from two of the WPA's up and coming rocket wonderchildren.

Composite Rocket Motors - Gary Purrington, Firefox
Learn how to make composite rocket motors and then make one of your own. Learn from a great supporter of the WPA and a man who has learned to love the smell of AP almost as much as black powder.

Stinger Missiles - Steve Majdali
Mr. Rocket Science himself returns for yet another rocket seminar. Let Dr. Rocket show you how to make stinger missiles and then, if you're nice, he might let you make one of your own!

Round Shell Building - Gregg Materna
Members will be shown how to make a 4" round plastic shell and then be given the opportunity to make one of their own, and even see it go! A newcomer to the WPA seminar scene, Gregg has found shell making a more socially accepted habit then tobacco chewing.

Mortar Rack Construction - Paul Salverson and Dimitri Timohovich
Ever wonder how those mortar racks are constructed? Learn from two of the WPA's grumpy old men how to properly construct racks that even the California Fire Marshall will love... and help the club gather more racks in the process.

Armageddon II - Greg Adler and Paul Salverson
Remember Greg's class C extravaganza at last years Do It? Learn the techniques of timing, fusing and choosing your cakes from the two mystic masters of class C (with a little B thrown in as well). This seminar is subtitled: How to light all of your fireworks at once for total fun and little profit.

Do It by the River is brought to you by the WPA and presented by:
Kief Adler & Dimtri Timohovich - Chief Cooks and Mortar Stuffers
Kurt Medlin - Seminars
Don Oesterle & Russ Laurie - Safety
Paul & Jill Salverson - Registration
Bill Daly - Radios and Chief Trouble Maker
Lynden King - Stinking Badges
... plus a host of others not mentioned here, but worthy of your thanks!

Remember: you MUST attend one MANDATORY safety meeting, no matter who you are or how long you've been shooting, in order to get the magic wrist band that will let you into the shooting areas. The welcome part of the meetings are for questions and answers and a general hello so stick around.

Afterglows will be on site after the shooting stops and the magazines are locked. Buy beer and soda and swap lies with your friends. Make fun of those not in attendance.

Let's Do It!

ATTENTION DO-IT SEMINAR ATTENDEES

If you are planning on attending either the Class C+ (Armageddor or the Finale Rack building seminars, please bring your own tools.

Suggested tools to bring:
- Makita or DeWalt drill/screwdriver
- Portable (battery) circular saw
- Hot glue guns or caulking gun (we will supply the liquid nails)
- End nippers/diagonals (something to cut fuse)
- Masking tape (3/4" & 2")
- Possibly duct tape or 2" glass tape
- Anything else that you feel will make these assemblies run that much smoother.

See you at Do-It

⇒ One final note, those of you that did not attend last years, a folding chair will come in handy as there are no bleachers available.

Get On The Email List !

If you have email and aren't on the list you are missing out! Meeting announcements, get togethers, pyro shows, advice, ideas and much more are coming across the list daily.

Send an email to: **list-admin@wpa.pyro.org** In subject line specify if want the "list" or the "digest" and your email address you want to receive it at.

What is the difference between the two?
- If you want to receive the email as it is sent out, one at a time go for the list.
- If you would prefer to receive one email at the end of each day with all of the emails in one then you'll want the digest.

WPA History

by Jill Salverson

As you may remember, at the general meeting at the latest WinterBlast I volunteered to gather together a history of the WPA.

I have put a small blurb on the List, but now here is my BIG PLEA.

Do you have any photos, programs, itineraries or any print material concerning past WPA events which you would LOVE to donate toward a WPA History/Memory Book? I would be glad to have them copied and send back the originals, if you wish. Or do you have any copies to send? I think this is a good idea, but definitely cannot do it alone. I would also love stories of how we got started, what goofy and fun things have gone on, what we've learned, who we've met. We need stuff from everything, especially the early days before there was WinterBlast. How about stuff from smaller area events?

Many of you have offered, but I haven't received anything. I would love to have something started to display at next WinterBlast. If you are coming to Do-It, that would be a great time to drop stuff off to me. You can't miss me, I'll be handing out your t-shirts (registration). Maybe we can find a moment so I can write down any stories you may want to tell. Or you can send momentous to me care of the WPA P.O. Box. You can always e-mail me at mrspyro@aol.com for my home address.

Please, please, help and I thank you in advance.

Thank You ! ! ! !

A loud and titanium embedded, WPA thank you goes out to Rein and Nancy Beeuwkes for their generous financial donation to the club that has enabled us to purchase an electrical firing system from Pyromate. Kudos as well to David of Pyromate, Inc. for his generosity in discounting the price of the system to cover the donation. If you see these folks at Do It or Winterblast, be sure to thank them personally!

Legal First-Aide for the Hobbist

by K.L. Kosanke, Ph.D., PyroLabs, Inc

Just a few moments ago I finished writing an another affidavit for another attorney representing yet another fireworks hobbyist. Once again, the facts of this case and its result sadly points out the need for better information among hobbyist experimenters. While I do not have time to give the subject the full attention it deserves, I will take time to outline a few of the most important points. (However, note that I am not a lawyer and these are only my personal opinions.)

1) If you are a hobbyist experimenter, you should have in your possession, a copy of the ATF Newsletter (vol. 2, 1990, p.11) documenting the BATF's position that a federal license is not required in many cases.

2) You should know that, just because you may not need a federal license, that does not mean you do not need a state license. However, in several states that is now easier and cheaper to get than you might think.

3) It is generally a minor accident or a nervous neighbor that draws the attention of law enforcement officials. Thus, being extremely safe and not conducting yourself in a manner that raises concern with neighbors is essential. (If you do not have the requisite safety knowledge and a proper place to work, you should not be working with pyrotechnics.)

4) Do not rely upon the law enforcement officers to know about the legal status of hobbyists, or to be able to properly identify fireworks items as being fireworks (and not as bombs or incendiary devices). When you are only trained to look for bombs, many things look like bombs.

5) Many, hobby experimenters are guilty of something: state or local regulations, endangerment of neighbors (or your own minor children), improper storage, improper use of fireworks, etc.. Thus you need to identify and eliminate these potential problems BEFORE pursuing your activities

6) In most instances, when a hobbyist has a legal problem, the prosecution will charge them with just about everything they can think of, even if there is little chance of winning on all of the charges. (I think this is sometimes done to put you in the mood to accept their version of an appropriate plea bargain.)

7) If you do find yourself needing a lawyer, seek advice on who to hire before actually hiring the criminal defense attorney that will represent you; they are not all equally skilled or well motivated.

(This is not easy advice to follow; there seems to be something about sitting in a jail cell that creates a powerful sense of urgency.)

8) Do not pay an attorney a fixed price for a package of his services. You will need to establish a trust account to guarantee payment of the attorney, but draws on this account should be made as the individual services are performed. This will help keep the attorney's interest where it belongs, on your interests and not on wrapping things up as quickly as possible.

9) A trial will be very expensive, will put you and your family through hell for several months (preparation and trial), and is a crap-shoot with no guarantees. Do not accept a poor plea bargain, but do not be too idealistic either.

10) If you do decide it is in your best interests to plead guilty, try to only plead guilty to those things to which you actually are guilty of, e.g., making fireworks, endangerment, improper storage, etc. (Your attorney should get good advice early in the process. It is likely this will be the first fireworks or explosives case they will have worked on. A mistake or missed opportunity may cost you much and there usually is no second chance.)

11) If you plead guilty, try to get deferred sentencing (called various things in different states) as part of the plea bargain. This will mean that all records of your conviction will be sealed (will essentially go away) at the completion of your sentence (often just probation for several years) if you do not have further legal trouble during that time.

12) If you do have to serve some time in jail, try get work release as part of the plea bargain. This will allow you to keep your job (in the unlikely event that they do not fire you), and you will only spend evenings and weekends in jail.

At the very least, having legal trouble as a result of your hobby experimenting, will be embarrassing and VERY expensive. At most it will cast a serious shadow over the rest of your life. Do not be so foolish as to think these problems will not happen to you, or that because you personally feel that fireworks laws are unjust you have a right to ignore them, or that after you get in trouble there will be some magic cure that will get you off. In recent years I have assisted one or two hobbyists per year; in most cases it has been a truly sad experience. Sad, because, for the most part, these have been good people who end up paying a terrible price for their hobby.

PLEASE, TAKE THE STEPS NOW TO CONDUCT
YOUR ACTIVITIES LEGALLY AND SAFELY.

Minutes from Board of Directors Meeting - September 6, 2000

The board of directors meeting of the Western Pyrotechnic Association was called to order at 8:33pm on September 6, 2000 via AT&T telephone conference, by Kief Adler.
Members present: Kief Adler, President; Keath Nupuf, Secretary; Kathy Baird, Treasurer.
Staff present: Dimitri Timohovich, Beckie Timohovich

1. **Motion**: by Kief to elect Dimitri Timohovich Vice President of Publications.
   Motion seconded by Keath.
   Discussion: As Dimitri has previously demonstrated his abilities by publishing the previous newsletter discussion was brief.
   Vote: unanimous approval. Motion passed.
   Welcome to the new BOD member Dimitri.
2. WinterBlast 2001: A Fireworks Odyssey
   The committee on the next WB was presented by Beckie. Plans are well underway with 6 months to go. Most chairs have been filled. A contact sheet has been presented to members. The board agreed that a terrific job is being done by this committee.
3. Discussion for laws changes by Kief.
   a. WinterBlast compensation policy was reviewed. Amendments were made to various chairmen for hotel reimbursements and meals.
      Motion: by Keath to pass the WinterBlast compensation policy as modified. **Motion:** seconded by Kief. **Vote:** 4 in favor of changes, non opposed. Motion passed.
   b. Kief discussed the possibilities of by-laws changes for board members stipends and VP of publications bonus per newsletter. Kief feels that BOD members who enters the board in the middle of a term, not be paid the stipend for that year, and that a bonus paid to the VP of publications per newsletter is a duplication of reward. All board positions are a lot of work and newsletter is that positions responsibility. Keath discussed the added workload of producing a newsletter and the original intent of the added compensation was to encourage at least 4 newsletters per year. Discussion also involved prorating the new BOD members stipend for the amount of time served. It was agreed to table the discussion to a future date.
4. Do-it Update by Kief: To date there are 50 people registered for Do-it in October. Seminars are being arranged, B shells will be sold, and there will be an on-site afterglow party on the Arizona side of the site, after everything is cleaned and locked up. Curfew is still 10pm and does not look like it can be changed.

5. Palmer case update: Palmer's lawsuit against the WPA is back in the court of California. Our attorney fees are rising. PGI has donated $2000. to help with our expenses and is very interested in what is happening.
6. Tripster Insurance policy has been offered by Dolliff Insurance for WB. It is a very minimal insurance coverage and very expensive for the club to offer. Kief has discussed with our attorneys as to the pros and cons of having this insurance, of only $1000.00 per occurrence. They said that some insurance is better than no insurance. It was agreed to table the discussion until more information is available on our choices.
7. A brief discussion about arranging a board of advisors for the WPA was tabled until a later meeting due to the length the meeting was already running.
8. Kief has been contacted by members about some offensive language used on the WPA list. Kief has posted a reminder to all that we should be adult about the words used in discussions on the list. The list is not monitored, has no plans to change this. The board appreciates the concerns of its members and will again ask that we police ourselves as much as possible when participating on the list.
9. Treasurer report: 7/01 to 9/01 Income: $2000.00 donation from PGI, $1170.00 from membership renewals, $1070.00 Do-it registrations. Expenses: We have paid out $8,902.30 during this period for various expenses including but not limited to pre-newsletter and newsletter printing and postage, board telephone conference calls and legal fees. Balance on had at this time is $36,595.61.

II. Adjournment: There being no additional general session of business the meeting was adjourned at 9:15 pm.

Respectfully submitted, Keath Nupuf, Secretary

The Art of Firefly

First, just what the hell is firefly? Well, the concept is white lights that start appearing in the tail of a star or comet well after the comet is gone or past the point in space where the dots of light form. In other words, something burns to provide dots of white light that have a significant delay from the apparent source. This explains why the effect is called firefly: small white dots of light flickering on and off. Although there are variants, Aluminum is the primary source of the white dots. Discrete white dots call for, as you would guess, large flakes or "flitters" of aluminum. The trick for the pyro is this: lots of dots (density), long delay (transformation time), and long duration. As usual, there is more to the recipe than the formula.

About a year ago, I was consumed trying to make good Firefly. The formula I used was as follows:

KN	45
C (air float)	27
C (80 mesh)	10
S	8
Al (Firefly course flitters)	2.5
Al (Firefly medium flitters)	2.5
Dextrin	5

The mechanical part of the recipe included ball milling the potassium nitrate, air float charcoal, and the sulfur. After ball milling, the 80 mesh charcoal and dextrin were added and well mixed (screened). Finally, the Aluminum flitters were added. The comp was wetted with 8% by weight with H_2O, and pumped into a variety of sizes of comets. The smallest was ¾" to facilitate quicker drying (more on that later).

The results were less than optimal (they sucked): Low density, no delay, and poor duration. Frankly, instead of a cloud of fireflys, I ended up with a very small herd of those tiny little white Christmas tree bulbs. Disappointing.

Now I started flailing around, trying to figure out what was wrong. By flailing, I mean sending emails to many folks who purportedly "gave good firefly", and running experiments. Adjustments included "Ya can't make good firefly with dextrin, gotta use wheat paste", "Ya gotta use way more water than usual, water is the key", "Your problem is that you're usin' distilled water (I always do in pyro), ya

have ta use hard tap water", and finally "Adding 3-4% barium carbonate will fix the problems yur havin', it's a substitute for really hard tap water".

Well for sure adding barium carbonate helped improve the firefly. Density and delay improved, but still was high on the suckometer (pronounced suck-om-meter, it is a highly technical measuring device used to quantify the degree to which something sucks, similar to a vacuum gauge). I might add that wheat paste did seem at first to improve the firefly effect, but when fully dry they were unchanged from the first attempt (i.e. they were better ever so slightly wet!).

As any pyro knows, all these experiments started to get a little old after a while. Mixing, wetting, pumping, drying, testing (well, not that part) can get tedious when un-rewarded. I was about ready to have a spaz attack, so I put the whole thing on hold and flew to Japan. I would like to say that I flew to Japan to consult with some ancient pyro god, but in reality I was working on disk drives. On the way over to Japan, I took a few hour "nap" which is to say I closed my eyes and tried to sleep while flight attendants banged around and people climbed over me to get another chocolate chip cookie. Luckily, I had taken a copy of Lloyd Ogelsby's treatise on Glitter, thinking I might figure out what was wrong with my firefly since the two phenomenon seemed very similar to me. This served two purposes: 1) I learned the chemistry of Glitter, and 2) I went to sleep.

Here's how I figured it out: First, everyone knows you don't ball mill glitter comp. Why? Everyone doesn't know that, they just know you don't. The answer, I believe is in the formulation of the "spritzles": hot molten blobs of potassium sulfide on or surrounding particles of aluminum that form the "dots" of light. An exothermic reaction takes place in the liquid mass with the aluminum, and this heat eventually (the delay) ignites the aluminum. Ball milling the comp produces a much faster, more complete reaction of the principle ingredients, bypassing the molten intermediate products phase which forms the glitter spritzles. Same for firefly. My mistake was in ball milling the base ingredients: the burn was too fast and complete to form the molten intermediate reaction products which could "do their thing" with the aluminum.

Here's the physical evidence pointing to the above conclusion: Remember the first "BP" you made with a mortar and pestle? The stuff you thought would blow up but instead was a lousy fountain? Compare that to well ball milled BP, or Wet processed BP, by burning the sample on a witness plate. The crappier the mixing, the more "pearls" of reaction product that get thrown all over the place. It is these pearls that form glitter, or firefly. Ball milled firefly mix throws no pearls comparatively.

6. Registration Chairman:
   A. Registration Fees
   B. Hotel room for 3 nights
   C. 3 free meals from on site vendor
   D. WWB Staff Shirt
7. First-Aid Chairman:
   A. Registration Fees
   B. WWB Staff Shirt
8. Exhibition Chairman:
   A. Registration Fees
   B. WWB Staff Shirt
9. Work Crew Chairman:
   A. Registration Fees
   B. WWB Staff Shirt
   C. 4 free meals from on site vendor
10. Public Display Chairman:
   A. Registration Fees
   B. WWB Staff T-Shirt
11. Vendor/Flea Market Chairman:
   A. Registration Fees
   B. 2 hotel nights
   C. Registration fees for co-chair
   D. 2 WWB Staff Shirts (one for each)
12. Seminar Chairman:
   A. WWB Staff Shirt
   B. Registration fees
13. Registration Booklet:
   A. Registration fees
14. Sound system:
   A. Registration fees
   B. WWB Staff Shirt (2)

15. Board of Directors
   A. WWB Staff Shirts, 2 each (10)

No duplications of compensations will be allowed. For example, a Board member also taking a WWB position is already receiving shirts and a registration comp and can not receive double compensation.

Whistle Rockets

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A whistle rocket is a skyrocket that whistles as it propels itself. The whistle effect itself has been the subject of much study[1] and won't be discussed here. The whistle composition produces much gas quickly and is an excellent rocket fuel. Despite their smaller size, whistle rockets often lift more and move quicker than their black powder counterparts.

Materials:

- Parallel wound cardboard tubes cut to half the length of the same caliber traditional black powder rocket tube (i.e., a traditional 4oz rocket tube is ½" I.D. and 5" long. The 4oz whistle rocket tube would be ½" I.D. and 2 ½" long)
- Sticks for guidance (same size as for traditional black powder rockets)
- End plugs to cap the rockets

Compositions:

The compositions are based on work done by Selcuk Oztap (Pyrotechnica XI and XIII) and include the oxidizer, fuel, lubricant and catalyst.

Potassium Perchlorate	64	75
Sodium Salicylate	32	20
Petrolatum	3	3
Mineral Oil	1	2
Iron Oxide		

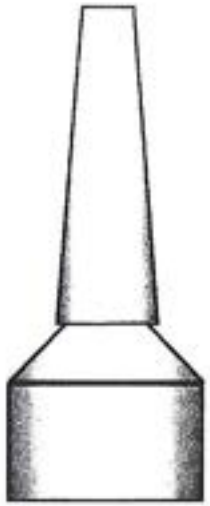
The fuel (sodium salicylate) and catalyst (iron oxide) are sieved together through a 40-mesh screen till uniformly pink in color. The lubricant (petrolatum or mineral oil) is kneaded into the salicylate/iron oxide mixture until it is evenly distributed. Kneading the mixture in a large, zip-closured plastic bag helps keep down the mess (NOTE: this shouldn't be done with the potassium perchlorate included). When the lubricant is thoroughly dispersed in the mixture, spread it out on a piece of kraft paper and sieve the potassium perchlorate on top of it. Then sieve the entire composition two or three times through a 40-mesh screen.

CAUTION: This composition is very energetic and can explode if ignited when loosely confined. Treat it with the utmost caution and respect. Work with the smallest practicable amount in the work area. Clean any spills immediately. Dispose of any waste safely. Store unused composition in a cool, dry place, locked away from those not involved with the process.

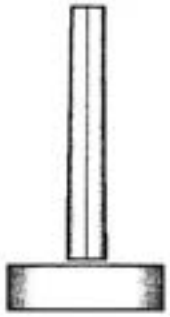
Tools:

The tools should be made from non-sparking metals such as aluminum, brass or certain stainless steels. Various configurations have been used with differing results. For ease of use desired design characteristics include a tapered spindle and high polish. (See the drawings below) Rammers should be tailored to the spindle. A cross-hole near the top facilitates removal after pressing.

A press is the preferred tool for manufacture of whistle rockets. Either mechanical (arbor) or fluid power (pneumatic or hydraulic) works well. Avoid hand ramming any high-energy material. A solidly mounted safety shield of polycarbonate sheet is recommended for the operator.



Spindle



"Stinger" Spindle

"Banshee"

Method of Assembly:

The tube is set on the spindle. Add a scoop of composition to the tube. Use a scoop of sufficient size to yield an increment height of ½ to 1 times the I.D. when consolidated. Insert the rammer and place the set in the press. Apply pressure to consolidate the composition to a single, solid grain. The rammer with a hole is used first, to accommodate the spindle. After the composition reaches the top of the spindle the solid rammer is used and the fuel is pressed in till it is ¾ to 1 I.D. beyond the end of the spindle. The solid rammer should not used before the composition has cleared the top of the spindle to avoid pinching any between the top of the spindle and the rammer (which could cause an ignition or explosion).

An end plug can be inserted or a thin layer of clay can be rammed on the top of the fuel and drilled for a passfire to ignite the heading. The whistle rocket is removed from the spindle with a twist and tapped on the workbench to knock free any loose composition or clay (which is wiped up with a moist sponge or towel). Two turns of 30-40 lb kraft are rolled around the open end of the motor to act as a nosing. The heading is added to the end with the paper or clay plug. The rocket is then stored in the magazine until it is ready to be fired.

To finish the rocket a stick is added for guidance and the whistle rocket is ready for fusing. Glue or strong tape can be used to fasten the stick to the rocket. A piece of safety fuse is taped to the guide stick and just touching the bottom of the fuel grain (a dab of compatible prime may be dipped onto the end of the fuse touching the fuel grain to ensure ignition). The nosing is twisted and tied around the safety fuse and the label added which finishes the rocket.

I wish to thank Warren Klofkorn and Kurt Medlin for their help and assistance in preparing this article by reviewing the draft and making many useful suggestions.

[1] PYROTECHNIC WHISTLES by W. R. Maxwell, 1953

* * * *

Throwing Squibs. (or the unlucky boy) [1813]

Mr. Tindall had a little son named Tom, who was very naughty, and never minded his book, but delighted in running about the streets, and playing with naughty boys. He was very fond of lighting bon-fires, and throwing squibs and crackers, and took particular pleasure in throwing them at people passing by, but more especially at women and girls.

His father more than once told him of the danger of playing with squibs, related to him many accidents caused by unlucky boys throwing them, and desired him never to touch one: he even whipped him once or twice for lighting squibs and crackers contrary to his orders: but all this was not sufficient to prevent Master Tom from indulging his mischievious inclination.

Once, on a rejoicing night, Tom, having a shilling and seven penny-pieces lying by him, which he had long hoarded up for the purpose, laid out the whole in squibs and crackers, and went to divert himself with a crowd of wicked little boys, in flinging them at every person who happened to come his way.

While he was amusing himself with this wicked sport, a gentleman came in sight who was riding on very spirited horse; and the horse appeared greatly alarmed by the squibs, starting and snorting every instant at the blaze and report. Tom thought this was rare fun, and resolved to have as much of it for his money as he could: so he quickly lighted one of the largest of his squibs, and flung it into the horse's face.

The poor animal, that was already very much terrified, now took fright to such a degree, as to be no longer manageable. He galloped off at full speed, threw down a nurse with a baby in her arms, rode over an elderly gentleman and two boys, hurt them all very much, and at last, stumbling on a bad spot in the pavement dashed his rider on the flagway. The gentleman was severely bruised by the fall: but as he had no bones actually broken, and was not killed outright, Tom disregarded the mischief, and still considered the whole as mere fun.

The wicked young villain was determined to continue this cruel and dangerous diversion as long as his stock of squibs lasted; and he only regretted that the number was not greater. Just as he was lighting another, his own father happened to pass by, on his way home from an evening visit in the neighbourhood. Tom was so bent on mischief, that he did not perceive that it was his father, but flung the squib right into his face; and it burst directly in Mr. Tindall's eyes.

A crowd immediately gathered round the unfortunate man : and one gentleman, who had seem Tom throw the squib, ran after him with his cane up-lifted, to give him a good beating. But Tom, who was well-acquainted with all the narrow alleys in the neighborhood, escaped from the gentleman's pursuit, and went to continue his sport in another street, as he had yet four or five squibs remaining.

Here, however, master Tom was in some degree rewarded for the mischief he had done. For, as he held the remaining squibs all together in his hand, and was hastily lighting one, to fling it into a carriage full of ladies, it burst before he had time to throw it, set fire to the others, and they all at once blew up into his own face. His hand was terribly burned: one whole side of his face was dreadfully scorched; and his left eye was entirely blinded.

In this condition master Tom was led home by some of his vicious companions. —A surgeon had already been called in to his father's assistance, and did every thing in his power to relieve both the father and his wicked son.--Tom's hand and face were cured in some time, but he never recovered the use of his left eye, and remains to this day blind on that side.

This, however, was not the worst of the mischief. His father was so much hurt in both eyes, that all the surgeon's skill could not restore the sight of either; and he continued wholly blind from that unlucky night to the hour of his death. Indeed it was not long before a sad end was put to poor Mr. Tindall's misfortune: for the loss of his sight, and the thought of his son's wickedness, grieved him so sorely, that he broke his heart in a few months, and died. As Mr. Tindall was not a gentleman of independent fortune, and had only supported himself by writing, he had not a single guinea remaining in the house when he died.-- His goods were sold: and, after paying the expenses of his burial, and some debts due the butcher, baker, and other persons, there was not money enough left, even to put Tom apprentice to any decent trade; so that he was in danger of being obliged either to go to the work-house, or to beg in the streets.

Jut [sic] at this time, it happened that Gregory Grime, a master chimney-sweeper in the neighborhood, lost one of his little apprentices, who fell from the top of the chimney, and was dashed to pieces on the pavement in the street below. Gregory had heard of Tom's distressed situation; and, thinking it would be no great harm if so wicked a rogue as he should fall in the same manner, and break his neck, he offered to take him apprentice, without any money.

As Tom had very little to eat, and saw little chance of getting more, he was obliged to consent to Gregory Grime's proposal. So Gregory took him home, pulled off his decent clothes, dressed him in a coarse shirt and breeches, with a woolen night cap, and a pair of old shoes, and at once converted him into a chimney-sweeper.

Instead of a good bed, such as he used to sleep in at his father's house, Tom now lies upon straw without sheets, and with only a ragged blanket to cover him. He seldom has any thing but coarse bread alone for his meals, and hardly enough of that: he is obliged to rise early in the morning, before he has slept half the necessary time, to go about the streets in rain and cold, without coat, waistcoat, or stockings, crying "Sweep oh! soot oh!" & is glad when he can get a dry crust of bread, or a morsel of cold meat, in any of the houses where he is employed to sweep the chimneys.

All these misfortunes have been brought on him by his own wickedness in throwing squibs. He often bitterly laments his ill conduct, and wishes he had followed his father's good advice.-- If he had done so, he might now be at a genteel boarding school, with both his eyes safe, instead of being a chimney-sweeper, and blind of one eye. Let his punishment serve as a lesson to other boys, and teach them how wicked and dangerous it is to play with squibs.

Clay Preparation : The Toilet Bowl Wax Way *by Warren Klofkorn*

One of my pyro friends suggests the following method oftreating clay for pyro use. Many pyrotechnists use clay to plug the ends of tubes, and to form rocket nozzles and the like. Usually a small amount of water is added to improve cohesion of the clay. Some pyros have noted that this method doesn't work very well when temperatures are below the freezing point of water. At these temperatures the clay often becomes powdery. Rocket nozzles erode, drastically decreasing performance. Old time pyros have reported the use of used motor oil for the purpose. Jack the Pyro suggests using wax toilet bowl rings. Here's the (pardon me) hot poop....

Jack purchased from the local hardware or plumbers' supply outlet some of their wax toilet bowl sealing rings -- the ones used to form the seal between the seat itself and the hookup plumbing. The one I got came in a white pasteboard box with blue printing. Inside the box he found a ring of brownish yellow wax wrapped in paper. This wax had an oily consistency, and smelled strongly of paraffin.

Jack related that he dissolved an amount of the wax equivalent to 5% of the clay in several volumes of Coleman fuel,(aka white gas, aka hexane). Jack stirred the solution into the clay, which required about 2 days for the Coleman fuel solvent to dry off. When the solvent had dried, he pressed the clay into rocket nozzles in 3/4" bore rocket motors. End of winter nozzle erosion problem. Also, the dust problem was eased substantially. I suspect that similar effect could be had with a smaller percentage of wax in the clay, but as they say in the scientific journals, more research is needed.

Stringer Missiles *by Warren Klofkorn © 1990*

Two years ago the Chinese fireworks industry introduced an unusual, spin stabilized skyrocket into the US fireworks market. The Black Panther brand Warhead Launcher was approved as class "C" merchandise initially but later withdrawn from the market because of its high content of titanium flash powder. Federal regulations specify that no class "C" item ought to have over 130 mg. of flash, but this item contained between 4 and 6 grams of solid, pressed flash per unit! The WHL was an immediate hit in the market place, but was imported for only one season in its original form before the manufacturers were forced to replace it with an emasculated version containing black powder and stars in place of the flash charge.

We might note here that the WHL concept has certain advantages over the traditional skyrocket. First, it lacks the traditional stabilizing stick or

fins. This makes it lighter, and therefore more efficient. It travels further and faster than a traditional rocket of the same size. Without the stick, it is less dangerous on the way down. This assumes that it comes down at all. The reality is that the flash charge on the old version WHL usually destroyed the rocket, leaving only a cloud of confetti. Also, the WHL design seems to have less tendency to turn into the wind, and overall less tendency to make annoying direction changes than traditional rockets. Altogether, there are several reasons why spin-stabilized rockets such as the WHL or the Stinger might be considered for use in some public displays where other rockets might not be practical.

WHL fans need not lose hope. The "Stinger Missile" is both quick and simple to make, and outperforms the Chinese WHL. You'll need a set of tooling. Figure 1 shows tools designed to use cut sections of standard 1 lb. rocket tubing. The new, improved tooling uses 3 lb. size tubes. Get a machinist to turn your spindle on a lathe from brass or other non-sparking stock. Make the drifts with a drill press from hard aluminum alloy rod. Better yet, buy a set from Steve Majdali, who needs the cash.

For the standard size Stinger, cut your 1 lb. rocket tubing into sections 2 1/2" to 2 3/4" long with a band saw. The improved, larger 3 lb. size missiles use sections of tube about 4 inches long. The best bet for tubes is to buy the so-called machine rolls, and cut them to whatever length you find to be best after experimentation. Take care to cut the tubes at a 90 degree angle.

Use either an arbor or hydraulic press to load the tube with nozzle clay and propellant. About 6 cc of powdered Hawthorne Bond clay, available from ceramic suppliers, makes a good nozzle for the standard size Stinger. Straight homemade meal powder makes great propellant: 75/15/10 blended with hot water and precipitated with alcohol. The propellant needs to be fast burning enough that the "Stinger Missile" will develop a very fast rotation before leaving the launching spindle, since it is stabilized solely by the gyroscopic effect from its rotation. So be careful about adding extra charcoal or titanium for tail effects -- too much added and the device may not be adequately stabilized. If you use a standard 4.0 cc cartridge reloading scoop as a propellant measure each motor should take about 6 scoops of propellant. If the Stinger Missile is made well and spins quickly, it will give a distinctive chirping sound as it takes off from its pin launcher.

After loading the propellant, load the colored comet(s). Dampen slightly with the appropriate solvent (I use 99+% isopropanol) and measure the comp into the tube.Press firmly in place using moderate pressure on the press.I have used the green, red, and blue formulas from Shimizu, and a

perchlorate-based white electric formula with good results. Just be careful about selecting a comet comp that will be reasonably safe to press at high pressure. I've never had balls enough to try, forexample, pressing chlorate-based color comps. The Shimizu formulas belowrequire between 6 and 9 cc of unpressed powder to provide an adequate time delay.

Green Star

Barium nitrate	28.3%
Potassium Perchlorate	47.2
Parlon	4.7
Red Gum	14.2
Soluble Glutinous Rice Starch	5.6

Blue Star II

Potassium perchlorate	66.5
Accroides Resin	9.9
Cupric oxide	13.4
Parlon	5.4
Soluble Glutinous Rice Starch	5.6

Red Star

Potassium perchlorate	66 %
Accroides Resin	13
Lampblack	2
Strontium carbonate	12
Polyvinyl chloride	2
Soluble Glutinous Rice Starch	5 ()

Now, carefully drill the side vent. Determine where the propellant grain begins just above the nozzle (probably about 1.3 cm. above the bottom of the tube depending on how your tooling has been mounted). Drill an appropriate size hole, (between 3/32 and 1/8 inch diameter works well) just into the propellant grain at an angle tangential to the inside wall of the tube, and at a right angle to the vertical axis of the rocket. Use a drill press with a good, sharp bit for this operation or begin with a guide hole made with a

scratch awl and finish with a hand drill. I wax my drill bit periodically to minimize friction when drilling into live comp.

If desired, a flash report can now be added. 3 cc of 70/30: KClO4/ German dark Aluminum with a dash of cabosil works quite well. In fact, the design of the Stinger seems to maximize the audible effect of the flash composition. Place a 3/4" paper end plug over the flash charge touching the powder only enough to keep its mass from shifting when the device spins on take off.

Lightly glue a paper disk 1 1/4" diameter over the top end of the tube. A nice, rounded nose can be effected simply with plaster of Paris molded to form a spherical section -- I found an egg container that makes a dandy mold at a garage sale. Seal the nose section with 1 1/2" wide gummed paper tape. Finish with a decorative paper wrap lightly glued on, if desired,and then fuse with a 3" length of slow thermolite igniter cord or visco fuse which may be taped to the side of the tube with a small piece of tape. The device is now ready to fire from a pin type launcher such as a Warhead Launcher spindle. The standard issue WHL launching spindles are too small in the base so be sure to firmly secure them before firing; otherwise the torque from the "Stinger" can tip the launcher over with potentially disastrous results. Simply place the Stinger so that the pin of the launcher penetrates the center core of the rocket motor, allowing the Stinger to balance on the pin. Then light the fuse and retire quickly! Alternately, make your own pin type launcher made from a nail pounded through a large board and then filed round at the point. For the adventurous, get some lengths of 1/8" or 5/32" music wire at your local hobby shop and use custom-cut sections to construct a board for firing volleys of a dozen or two, or .... the sky is the limit. These missiles can easily fly 1000' high. Imagine a volley of these fired in a display!

* * * *

DO IT in Laughlin Nevada