

BING
BANG
BOOM!



★

**THE ANATOMY
OF A
GREAT FIREWORKS
DISPLAY**

Presented By:

John Prue
Installation Program Director (MWR)
Naval Station Great Lakes, IL

Wynn Cramer
Event Producer-Melrose Pyrotechnics, INC
Kingsbury, IN

The Plan



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Part 2
The Science



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BING
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Part 1

The History



The History



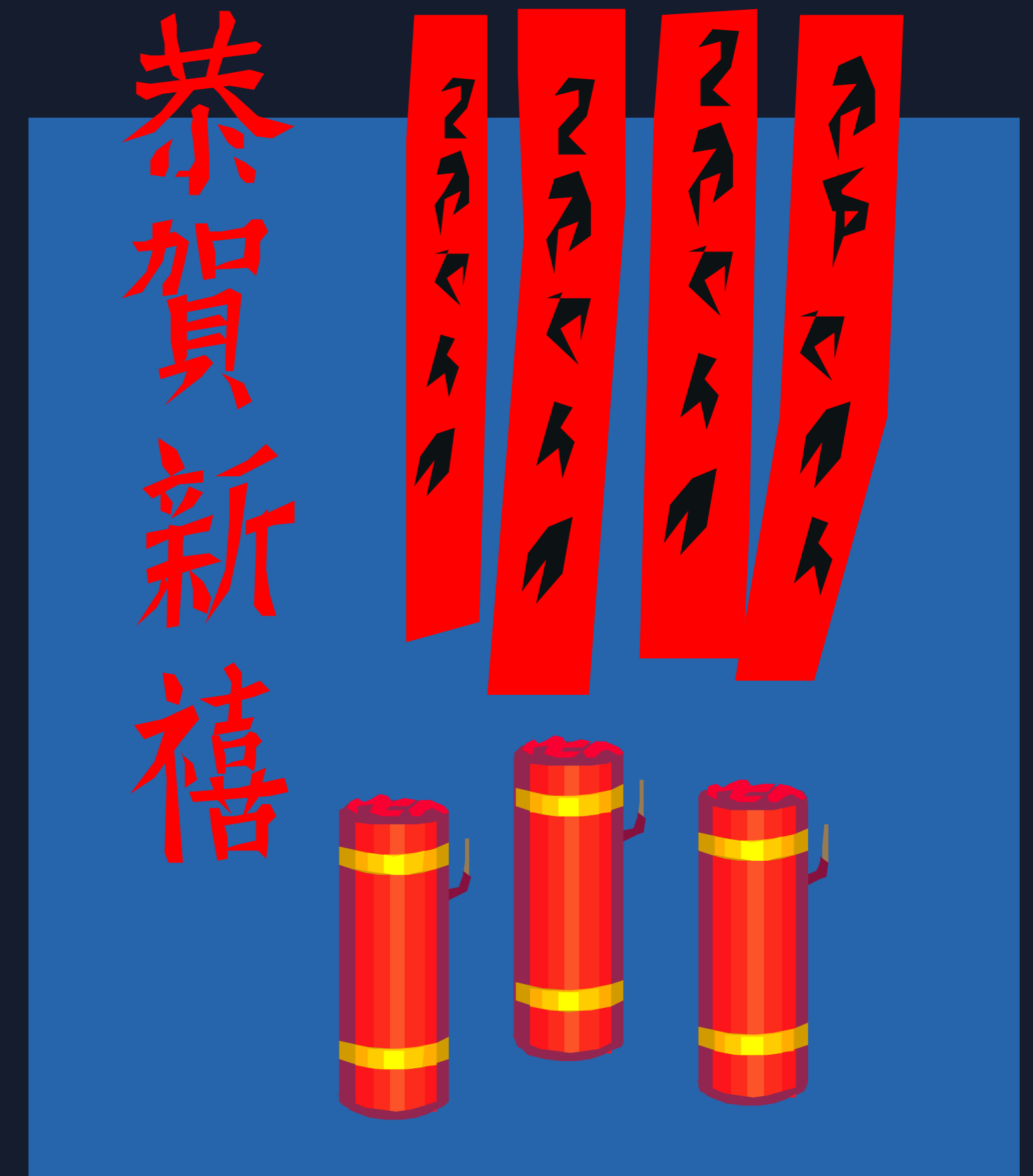
- Fireworks are also called pyrotechnics, which comes from the Greek words "pyr," meaning fire, and "techne," meaning art.
- Fireworks originated in China some 2,000 years ago.
 - The most prevalent legend has it that fireworks were discovered or invented by accident by a Chinese cook working in a field kitchen who happened to mix charcoal, sulphur and saltpeter (all commonly found in the kitchen in those days). The mixture burned and when compressed in an enclosure (a bamboo tube), the mixture exploded.

The History

A Chinese monk named Li Tian, is credited with the invention of modern day firecrackers about 1,000 years ago.

The firecrackers, both then and now, are thought to have the power to fend off evil spirits and ghosts that are frightened by the loud bangs of the firecrackers.

Firecrackers are used for such purposes today at most events such as births, deaths and birthdays. Chinese New Year is a particularly popular event that is celebrated with firecrackers to usher in the new year free of the evil spirits.



The History



Marco Polo is credited with bringing the Chinese gunpowder back to Europe in the 13th century.



Once in Europe, the black powder was used for military purposes, first in rockets, then in canons and guns. The Italians were the first to start to develop and manufacture “fireworks” for celebrations.

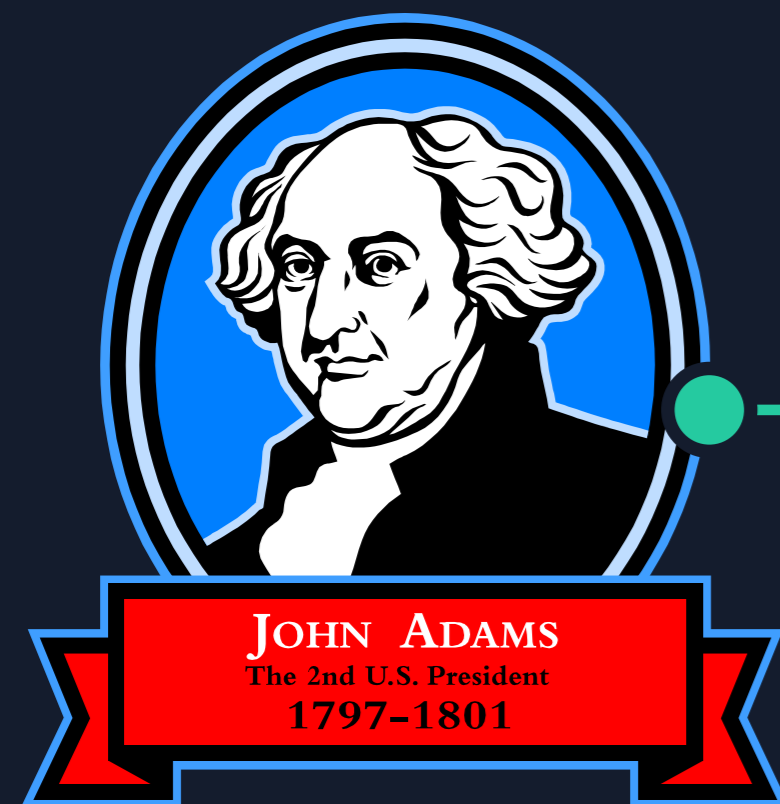


Fireworks became very popular in Great Britain during the reign of Queen Elizabeth I who created court position called “Fire Master of England” for the most talented pyrotechnician. King James II later knighted the man who made the fireworks display at his coronation.

The History



The first grand birthday celebration occurred in Philadelphia on July 4, 1777. Bonfires blazed, bells rang and bands played patriotic music. Fireworks were exploded, ships fired 13 gun salutes (to salute the thirteen colonies) and every house in the city displayed a candle in the front window.



John Adams predicted that July 4 would be an annual day of rejoicing. He expected the holiday to be celebrated with parades, games, sports, and bonfires.

The History



In the modern era, the American fireworks industry really began to influence Chinese manufacturers following President Nixon's normalization of relations with the Chinese Communist government in the early 1970s.



During the 1980s, China opened up dramatically to travel within its borders for visiting U.S. importers, allowing the first American fireworks buyers to travel to Hong Kong.

The History

The 1990s saw the rapid growth of commercial factories in China, supplying the world with the majority of fireworks used in professional displays, as well as consumer grade fireworks.

In the present day, the majority of professional fireworks materials used in the USA are imported from China. Smaller quantities of product are regularly imported from Italy, Spain, and Taiwan.



The History – FUN FACTS

- The Walt Disney Company is the largest consumer of fireworks in the world and has been, for many years.
- **World Record** -The Philippines welcomed 2016 with a bang. 810,904 shells of fireworks for an 1 hour 1 min and 32 seconds at midnight on Dec. 31, 2015.



BING
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BOOM!

Part 2

The Science



The Science

Fireworks are usually made out of the following items:



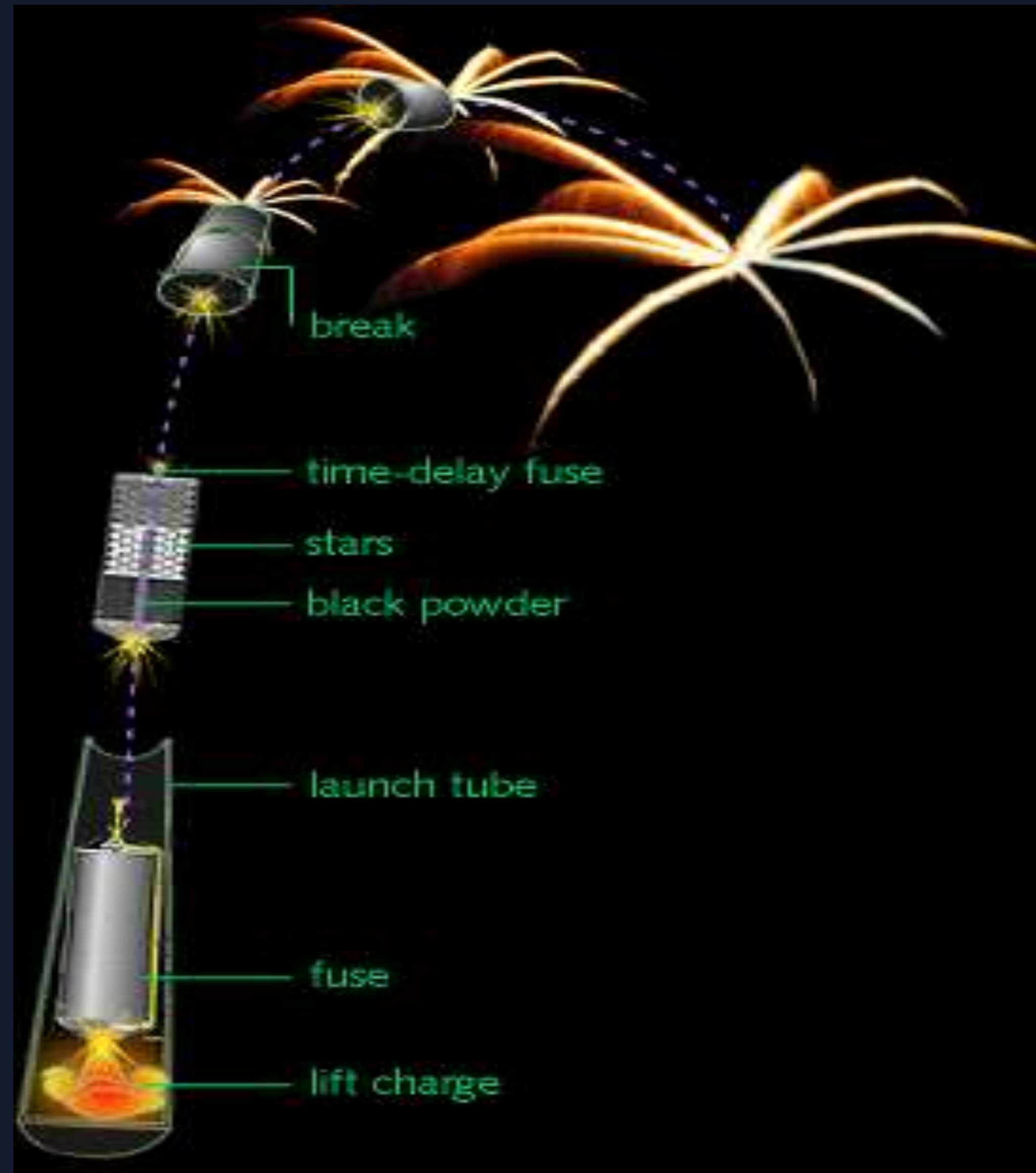
These mixed together are what make up the basic fireworks.

THE CHEMISTRY OF FIREWORKS

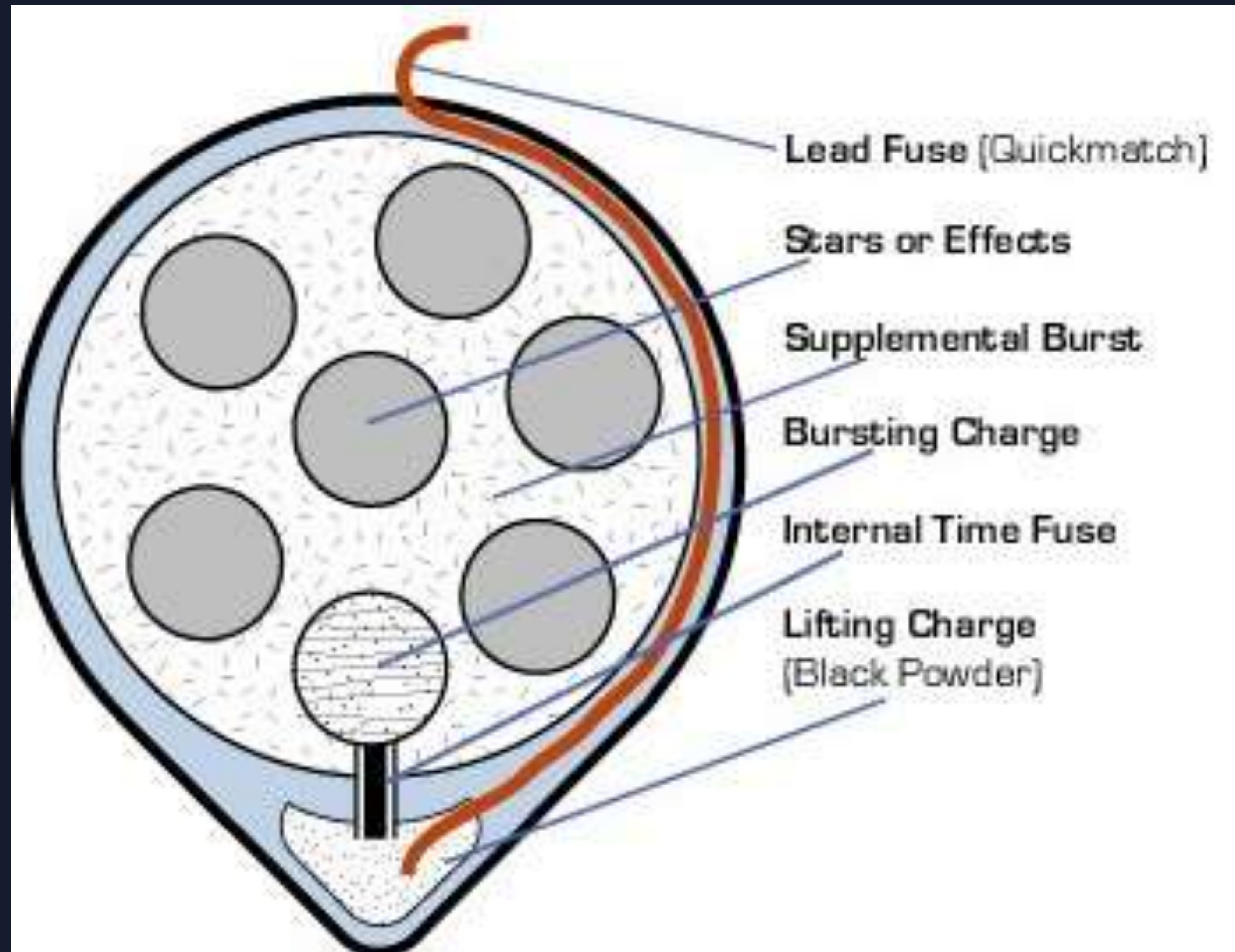


Colour in fireworks is produced by pyrotechnic 'stars', which produce coloured light when ignited. The stars contain five basic ingredients. **Metal salts** are used to produce colour; a **fuel** is needed to allow the star to burn; an **oxidising chemical** provides oxygen for the combustion of the fuel; a **chlorine-donating compound** helps strengthen some colours; and a **binding chemical** holds the mixture together.

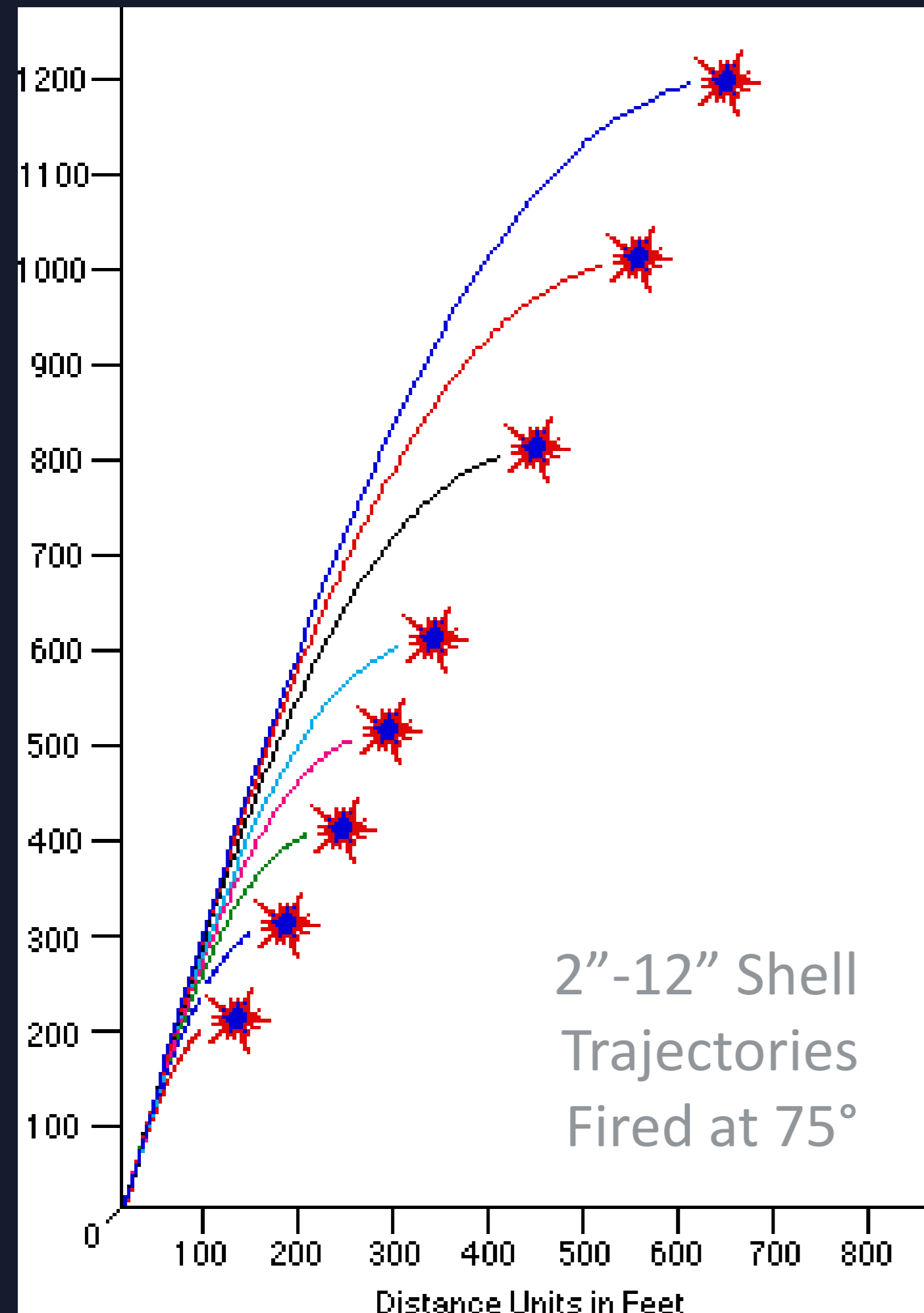
Components of a Shell



Components of an Aerial Shell



The Physics Behind It



Pyrotechnicians must take into account the relationships between:


vectors


velocities

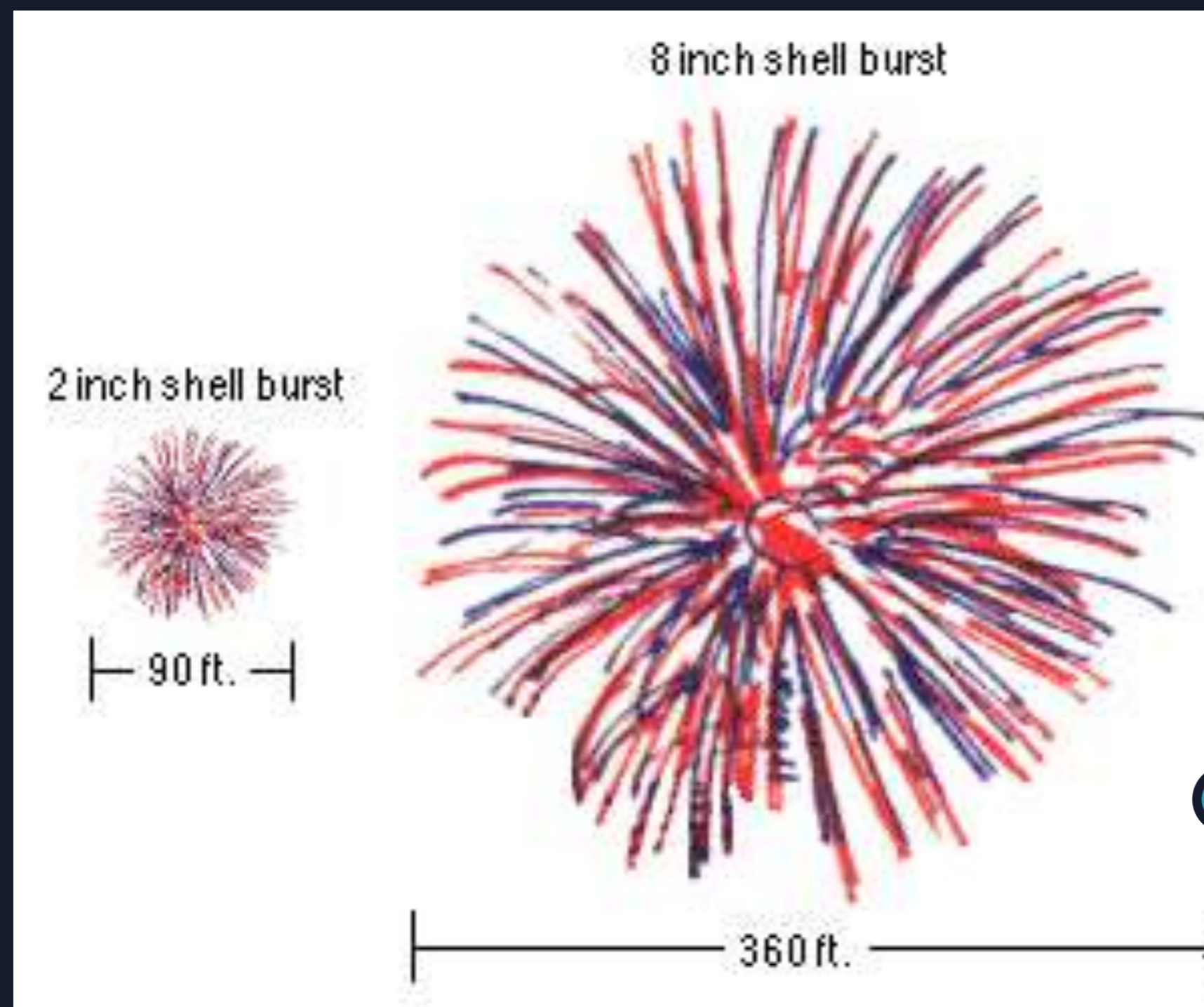

**projectiles
and their
trajectories**


**the explosion forces
behind burst
patterns, etc.**

Pyrotechnicians chart trajectories like in the graph on the left that shows the flight paths of 2" through 12" shells fired at 75 degrees.

The Physics Behind It

Shell burst sizes are usually about 45 feet in diameter for every inch in shell size depending on how tightly the shell is packed.



Pyrotechnicians must also consider shell burst sizes when planning shows. They must know how big certain bursts are when compared to others so that the choreographing of the show is in sync and so they don't exceed their safe zone requirements. As with initial mortar velocities, the bigger the shell size the larger the effect.

As you can see in the diagram above the differences in burst sizes can be extremely huge. It is just one more thing that pyrotechnicians must take into account to produce entertaining and attractive fireworks shows.

The Science + The Physics = The Magic

Fireworks Shapes

PEONY



CHRYSANTHEMUM



WILLOW



PEARLS



PALM



CROSSETTE



HORSETAIL



RING



COMET



BING
BANG
BOOM!

Part 3

The Homework



The Homework

Various Types of Displays

Traditional Outdoor Aerial Display	Pyromusical Display	Close Proximate Display	Indoor Display	Hand-fired	Electronically Fired	Computer Fired
<p>A high end fireworks display company will design/script the display and use an electronic firing system to perform the display.</p>	<p>Requires sound system, DJ, substantial design process by the fireworks display company. Will be electronically fired to produce an accurately timed display.</p>	<p>May require additional security, requires a special line of products made to be used in close proximity to performers/audience.</p>	<p>May require additional security and also requires a special line of products manufactured for indoor use. May also require additional permitting and licensing.</p>	<p>Was the standard method for display for many years. Some companies still hand fire, although it can be more dangerous than electronic ignition.</p>	<p>Standard practice for Melrose Pyrotechnics displays. Shows are fired with push button panels and voice cues.</p>	<p>Firing script is controlled by a computer system that performs the display with digital timecode.</p>

What to Look For in a Fireworks Display Company



- Not all companies are equal in terms of fireworks product availability, experience, personnel, talent, technology and capability.
- American Pyrotechnics Association (APA) a good source.
- The goal should be to provide your audience with the most entertaining fireworks display.
 - NOT the longest display
 - More Fireworks product does not equal a better display

When you watch a movie, you don't look for the longest film; you look for the most entertaining film.

Time or Length of the Show



Examples – Music & Narration

TRACK 1

For the last 108 years, Naval Station Great Lakes has trained more than 3.5 million sailors and warfighters including those recruits who graduated yesterday....and officially are the Navy's newest sailors!

By supporting the fleet with highly trained and combat-ready sailors, Great Lakes has been instrumental in making the United States Navy the most powerful in the world.

Great Lakes IS the Quarterdeck of the Navy!

2 SEC PAUSE

AND THIS IS OUR HOUSE!

TRACK 2

On behalf of CAPTAIN Ray Leung, Commanding Officer..... Welcome to Naval Station Great Lakes "4th of July Celebration"..... put on by YOUR Morale, Welfare & Recreation Department. Tonight we conclude this wonderful event with a spectacular Fireworks Extravaganza dedicated to all those in the armed forces who serve our nation and to all of those veterans who have served us in the past.

3 second pause

Tonight, we are also honored to be hosting a number of Navy Gold Star families. The Gold Star represents that a military family member has died while in service to the United States. For families who've made the ultimate sacrifice, displaying the banners year-round, or wearing a Gold Star pin, is a solemn way to honor and pay tribute to their loved ones.

TRACK 3

The Morale, Welfare & Recreation Department would like to thank all of their corporate sponsors who supported this event and special thanks to USAA, Miller Lite and 95 WILL ROCK....and specifically to our presenting sponsor of tonight's fireworks display....**HARLEY DAVIDSON.**

On our nation's 243rd Birthday ... please sit back.....and enjoy the sights and sound of this great country!

TRACK 4

Today, we have recognized our theme; "Celebrating Service....Veterans Past & Present". As we move into the final segment of our show tonight, we dedicate this for all those who have proudly served our nation! Pause... **BUCKLE UP!**

TRACK 5

On behalf of Naval Station Great Lakes and YOUR Morale, Welfare & Recreation Department.....we hope you enjoyed the show.....Once again, we would like to thank all of our sponsors during this entire celebration and a special thanks to USAA, Miller Lite and 95 WILL ROCK....and specifically to our presenting sponsor of tonight's show....**HARLEY DAVIDSON.**

Thanks for coming...pause.....Drive Home Safely.....and Happy Birthday USA!

TRACK 6

Due to the large crowds and heavy traffic going off base, we encourage all of you to take your time leaving tonight. Most of the food vendors are still open for business for the next 20 minutes. Again, drive home safely!

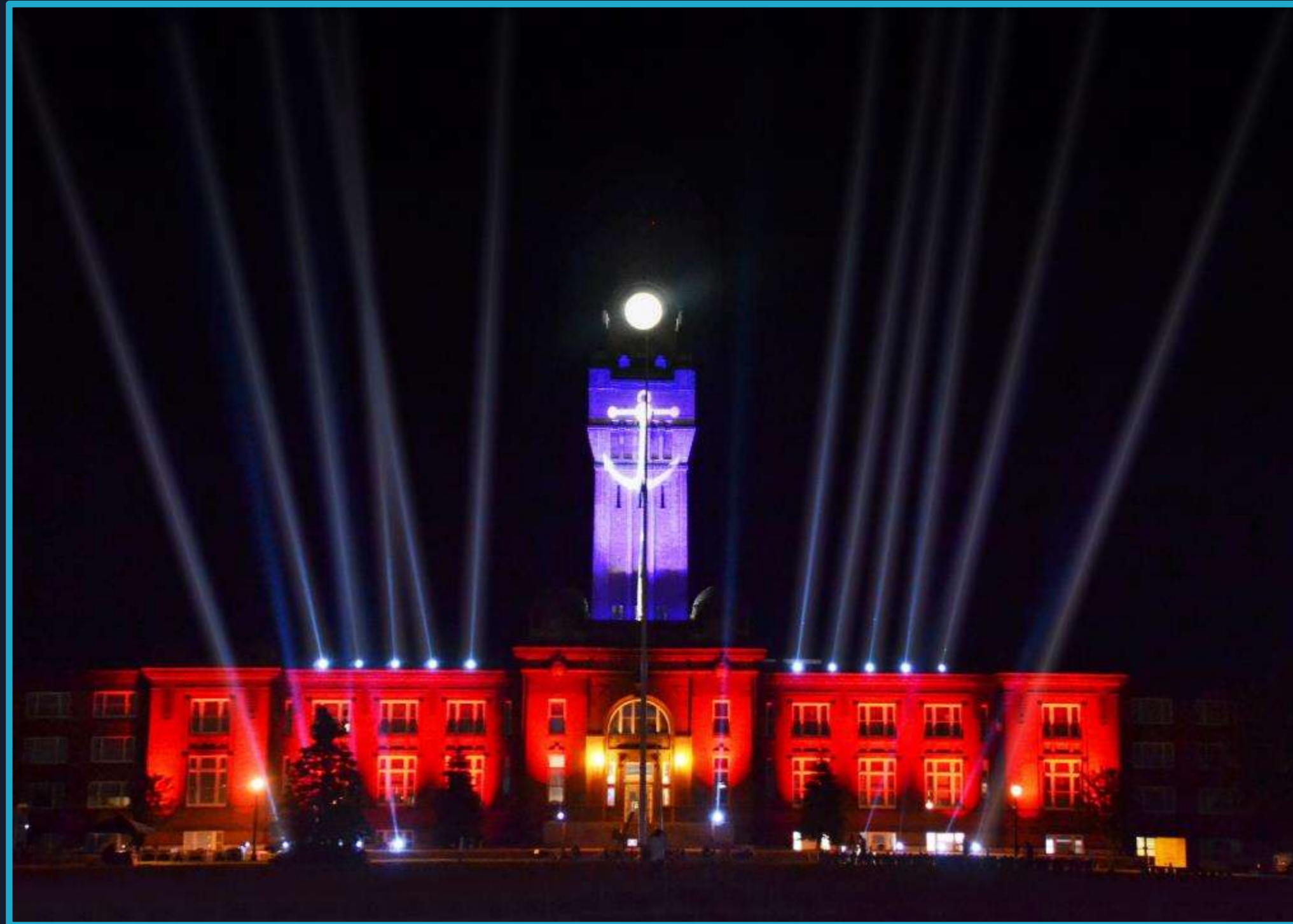
TRACK 7

On behalf of Naval Station Great Lakes and all of America...let's give another heartfelt round of applause for these great Americans and all those who have served in our Armed Forces....Celebrating Service - Past & Present

July 4th

Song Title	Artist
FOUR BELLS	ACDC-from Hell's Bells
Narration-Voice Over	Track 1
We Will Rock You	Queen
Narration-Voice Over	Track 2 & 3
Shoot to Thrill	ACDC (from Ironman)
Feel It Still	Portugal. The Man
Thunder	Imagine Dragons
Raise Your Glass	PINK
Grenade	Bruno Mars
Party in the USA	Miley Cyrus
Live & let Die	Paul M. & Wings
Get Up	Shinedown
Born Free	Kid Rock
Pause-Short Narration	Track 4
Great Balls of Fire	From 1989 movie
Amazing Grace-USMC version	Dropkick Murphy's
America the Beautiful	Ray Charles
Courtesy of the Red White & Blue	Toby Keith
FINALE:	
America-from Westside Story	SPECIAL MIX -blend both into one
Hooked on America (2018 edit)	
Final Narration to Closing Music	Track 5
Follow you Down	Gin Blossoms (Track 6 30 sec. in)
Closing Time	Semisonic
Walk this Way	Aerosmith
Goodbye for Now	Juanes
Little Pink Houses	John Cougar Mellencamp
Born in the USA	Bruce Springsteen

Pictures – Other Attractions/Enhancements



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BOOM!

Part 5

The Budget



The Budget



There is no typical standard budget for a fireworks display.



Larger budgets can give you a longer display, but longer displays are not always better:

- Shorter displays will be more powerful.
- Tailor your budget and display length to your crowd.
 - Ex. A Baseball game, concert, etc., caters to a shorter 10 minute display
 - For 4th of July, the display is the main event; 20-30 minutes is optimal duration.

Rule of Thumb
(Metric)

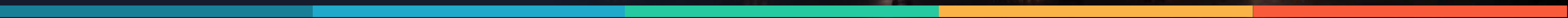


**\$1.5K/
minute**

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Part 6

The RFP



Things to look for in a display company:

Credentials

- Who are their clients? Have they won any international awards?
- What is their experience?
- Do they have references you can call?

Safety Record

Transportation record & transportation safety rating

Fireworks Product Lines

- Do they go to China and source their products directly or buy from a wholesaler?
- What are their product testing procedures?
- They should test and film all fireworks product for:

Duration	Debris Rating	Preflight Time	Overall Quality
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Display Companies should always visit a display site before submitting a proposal!

- Quality display companies will be able to provide you with a site diagram showing:
 - Setup area
 - Fallout area with distance markers
 - Audience location
 - Any unusual obstructions or features (ex. Fuel tanks, railroad tracks)

Fireworks - Request for Proposal

Baltimore's Light City, 4th of July Celebration and New Year's Eve Spectacular

The Baltimore Office of Promotion & The Arts (BOPA) seeks a company to produce a fireworks show for the Baltimore's Light City, 4th of July Celebration and New Year's Eve Spectacular.

Program Overview & History of BOPA

BOPA is a 501 (c) 3 non-profit organization which serves as Baltimore City's official arts council, events agency and film office. By providing funding and support to artists, arts programs and organizations across the city, and by producing large-scale events such as Light City, Artscape , the Baltimore Book Festival, July 4th/ New Year's Eve fireworks, and Baltimore's Farmers' Market & Bazaar BOPA's goal is to make Baltimore a more vibrant and creative city. BOPA also oversees historic attractions and sites including the Top of the World Observation Level, School 33 Art Center, The Cloisters, and the Bromo Seltzer Arts Tower. (www.promotionandarts.org)

Scope of Work

The contracted company will be responsible for designing, planning, choreographing to a soundtrack and executing the firework show for the 2018 Light City Finale in April, Baltimore's 4th of July Celebration on July 4, and/or New Year's Eve Spectacular on December 31. The main music stage will be at the Inner Harbor Amphitheater (see exhibit A). The New Year's Eve Spectacular and Baltimore's 4th of July Celebration should be high level shows that in the past were placed on barges (see exhibit B) compared to the Light City Finale which is a low level and intimate show within the Inner Harbor Basin.

Technical Notes:

- Ultimately, it will be the company's responsibility, working with BOPA's guidance, to secure all the necessary permissions and MOUs to use sites such as private property, building rooftops, etc., should they be incorporated into the show.
- Company is also responsible for submitting for City and State Fire Permits and FAA Notification and securing barges and a secure loading location.
- Proposed locations of the fireworks barges will be presented by the selected company and BOPA to the United States Coast Guard, which will include latitudes, longitudes, safety zones and shell sizes, no later than 135 days before the event.



Proposal Components

Proposals should include:

- Which show proposal is for, i.e. Light City, 4th of July Celebration and/or New Year's Eve Spectacular,, along with any multi-year options.
- Company history and successes, including safety record (one-page or less).

- If company has not produced a firework/ special effect show with-in the last four (4) years for BOPA, include two case studies of production similar in scope and size, with visual attachments and references/ contact information.
- Resume of the principal lead(s) that would design, plan and execute the show (one-page or less)
- Overview of any significant subcontractors/ collaborative partners relevant
- Description of how your company would conceive and execute, using a budget not to exceed \$70,000 per show for New Year's Eve (15 minute show at midnight) and 4th of July (18 minute show at 9:30 pm), and \$60,000 for Light City (7-8 minute show).

This working budget has been provided to give prospective bidders a level playing field for designing their proposals, and to assist with consistency during the review process. The actual show budget could be lower or higher, depending on variables such as negotiations between the company and BOPA, fundraising success and the ability to secure in-kind donations.

The budget should be turn-key for all elements specific to the company's responsibilities for producing of the show, including but not limited to staffing, labor, and crew; professional expenses including travel, hotel and per diems; all production costs (barges, fireworks shells, equipment, generators, security, sand, tug boats, set-pieces, lighting installations, subcontractors, etc.), permits and licenses , insurance, etc.



Review Criteria

In reviewing proposals, interviewing and making its decision, BOPA will be looking for the proposal that best demonstrates:

- Creative vision and wow factor
- Technical expertise and professional execution
- Ability to work well with the BOPA team
- Appreciation, respect and passion the project

RFP Timeline/Process

- RFP Released –Monday, May 15, 2017
- Deadline to register intent to bid – Thursday, June 1, 2017
- Proposals due – Friday June 23, 2017
- BOPA review – Monday, June 26 – Friday, July 7, 2017
- Decision –Monday, July 10, 2017
- Contract(s) executed – Friday, July 28, 2017

BOPA reserves the right to adjust the RFP timeline/process as necessary.

Proposals may be emailed to saudain@promotionandarts.org or mailed to:
Symone Audain, Special Events Coordinator
Baltimore Office of Promotion & The Arts
10 East Baltimore Street, 10th floor
Baltimore, MD 21202

BOPA will confirm receipt of all proposals it receives.

All proposals submitted to BOPA will remain confidential.



What to Include in an RFP



What **NOT** to Include in an RFP



Shell/product number requirements

- Shell quantities can be misleading
 - Ex. – Cake items, shells with multiple effects
- Higher shell quantity requirements often result in inferior fireworks products
 - Which could affect safety or performance



Actual Fireworks quantities are only determined after the display is designed



What **NOT** to Include in an RFP: Examples

CONTRACTOR'S RESPONSIBILITIES:

- Contractor shall provide Fireworks show lasting 25-30 minutes
- Fireworks show shall consist of a minimum of an opening | show, a main program, a grand finale, special effects and a set piece.
- Electronically fired display, choreographed to "broadcast quality" music provided by contractor.
- The following are minimally accepted number/size of shells
 - 2.5" - 3" Shells: 705
 - 4" Shells: 285
 - 5" Shells: 220
 - 6" Shells : 156
 - 8" Shells: 32
 - Special Salute Barrages: 900
 - 1" -1.5" Special Effect Shells: 4,548
- Contractor shall provide barge(s) and a buoy to anchor barge(s).



What **NOT** to Include in an RFP: Examples

REQUEST FOR QUOTES SHALL BE EVALUATED BY THE FOLLOWING CRITERIA:

1. Price of the fireworks show, price of the 24-hour cancellation notice and price of the 48-hour cancellation notice.
2. Experience - Contractor shall provide detailed company information and history related to ability to perform.
3. Shell count- number/size of shells



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Part 6

The Evaluation



The Evaluation



Work with your procurement office to determine a strategy but inform them on the complexities of Firework displays and evaluating the best value.



Find reliable and competent people for a “technical review” board for the evaluation of each proposal.



Develop a matrix for evaluation and value for each portion of the proposal

The Evaluation: Examples

Point System - The point system assigns a number two through five (2-5) starting at the smallest and progressing to the largest shell to calculate the number of shells proposed proportionately. The point system will be used to calculate the Main Show and the Finale.

Fireworks Display Quote 2019

Size of Shell/#	2 Inch	3 Inch	4 Inch	5 Inch	Other	Totals
Main Show						
Finale						
Specialty Bursts (Name/Type)						
Total # of Each Size						



The Evaluation: Examples

Proposals							
Company	A	B	C	D	E	F	G
0.5" shells					1200	1200	
0.75" shells					1400	1400	
1" shells							605
1.5" shells			7830				
2" shells	200			600			75
2.5" shells	240		990	216	170	170	174
3" shells	317	406	732	650	410	410	317
4" shells	186	237	246	285	224	264	151
5" shells	123	135	143	90	90	90	19
6" shells	70	96	75	27			17
Boxed set	2172						
Shell box		921					
Specialty shells	14			4882			
TOTAL	3322	1795	10016	6750	3494	3534	1358
COST	\$15,000	\$15,000	\$15,000	\$15,000	\$14,000	\$14,500	\$15,000
TIME (min)	25	25	25	25	27	30	25.25
Cost per shell	\$4.52	\$8.36	\$1.50	\$2.22	\$4.01	\$4.10	\$11.05

Points Matrix							
POINTS	A	B	C	D	E	F	G
Cost based on # of shells for budget (50)*	29.6	12.2	50.0	39.9	31.9	31.4	20.0
Experience & Qualifications of the firm (20)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
References (20) ¹	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Length of show (5) ²	4.2	4.2	4.2	4.2	4.5	5.0	4.2
Overall Show Quality (5) ³	4.0	4.0	5.0	5.0	4.0	4.0	4.0
TOTAL POINTS	77.8	60.4	99.2	89.1	80.4	80.4	48.2



The Evaluation: Examples

A	B	C	D	E	F	G
VENDORS	Company Background/History	Met all criteria in the RFP	Suggested Show Design	Shells (size/quantity)	Intangible (past performace w/agency, professional recommendation, personal recommendation)	Total
	0-3 pts	0-3pts	0-3pts	Rank (top-bottom)	1 pt extra allowed w/justification	
Company A	3	3	3	2	1	12
Company B	2	3	3	1		9
Company C	3	2	2	3	1	11
Company D	1	1	2	4		8

*Typically done w/Technical Review Board (3 or more people)
 *Determine basic criteria for each area ahead of time
 *Intangible extra point should be justified and documented.
 *Shell counts should be done by size with no added value for bigger shells--only total count



Other Options to RFP



- Multi-Year Agreements.
- RFP? Maybe Not - Find out if your Procurement Office/Board will accept that fireworks is something different (art form or entertainment show, etc...).
- Tinley Park-Park District (Illinois).

Superintendent of Recreation - Sandy Chevalier

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Part 7

The Choice



The Choice

The company you choose should be able to:

- Have your confidence that they will produce a safe, entertaining fireworks event that meets your expectations
- Provide references with displays similar in scope and size to your event

Display Company should provide:

**Public Liability
Insurance**

**Licensed Professional
Pyrotechnicians**

**Workers
Compensation
Insurance**

**All fireworks materials and
equipment necessary to
the production**

**Method for
arranging/designing the
display; ex. scripting software**

**Script of the Display
Program**

**Meet the technician prior
to your event**

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Part 8

The Show



The Show

A **good** display company will work with you every step of the way to help realize or even guide the creative process

Don't be afraid to set the tone and direction of your display!

DISPLAY DESIGN BEGINS WITH THE SOUNDTRACK

- A quality fireworks company will have full digital audio production facilities and work with you to produce a professionally edited soundtrack.
- Option-Radio Station partner for narration.
- The soundtrack can make a good display great by using a wide range of music styles, tempos, and genres that will appeal to your audience.
- The soundtrack can also be used to extend the display by incorporating narration and dramatic pauses to great effect.
- Once the soundtrack is finalized, the display design can begin.
- The fireworks company will script the display with design software and determine the quantity and types of effects used for the program.
 - This is why all of our proposals mention that the true number and types of effects in the program are approximated until the display is fully designed.

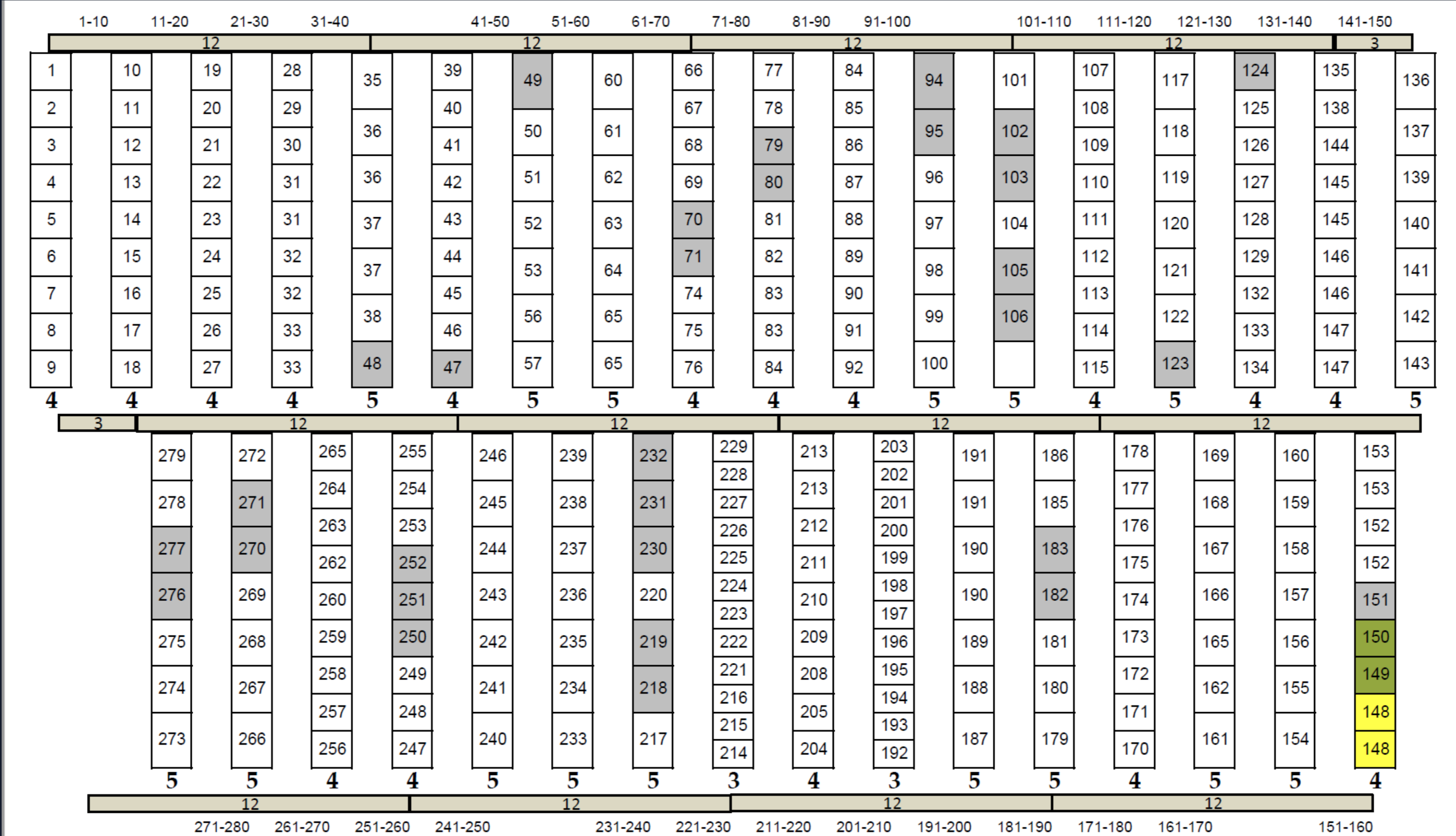
The Layout

After the display is designed, a layout is created. This is a schematic of the show setup which includes a representation of all of the mortars and addresses of the fireworks effects in the show.

After the show is designed and a layout is created, each firework device will be labeled and packaged, ready to be shipped to the display site.



Layout Example



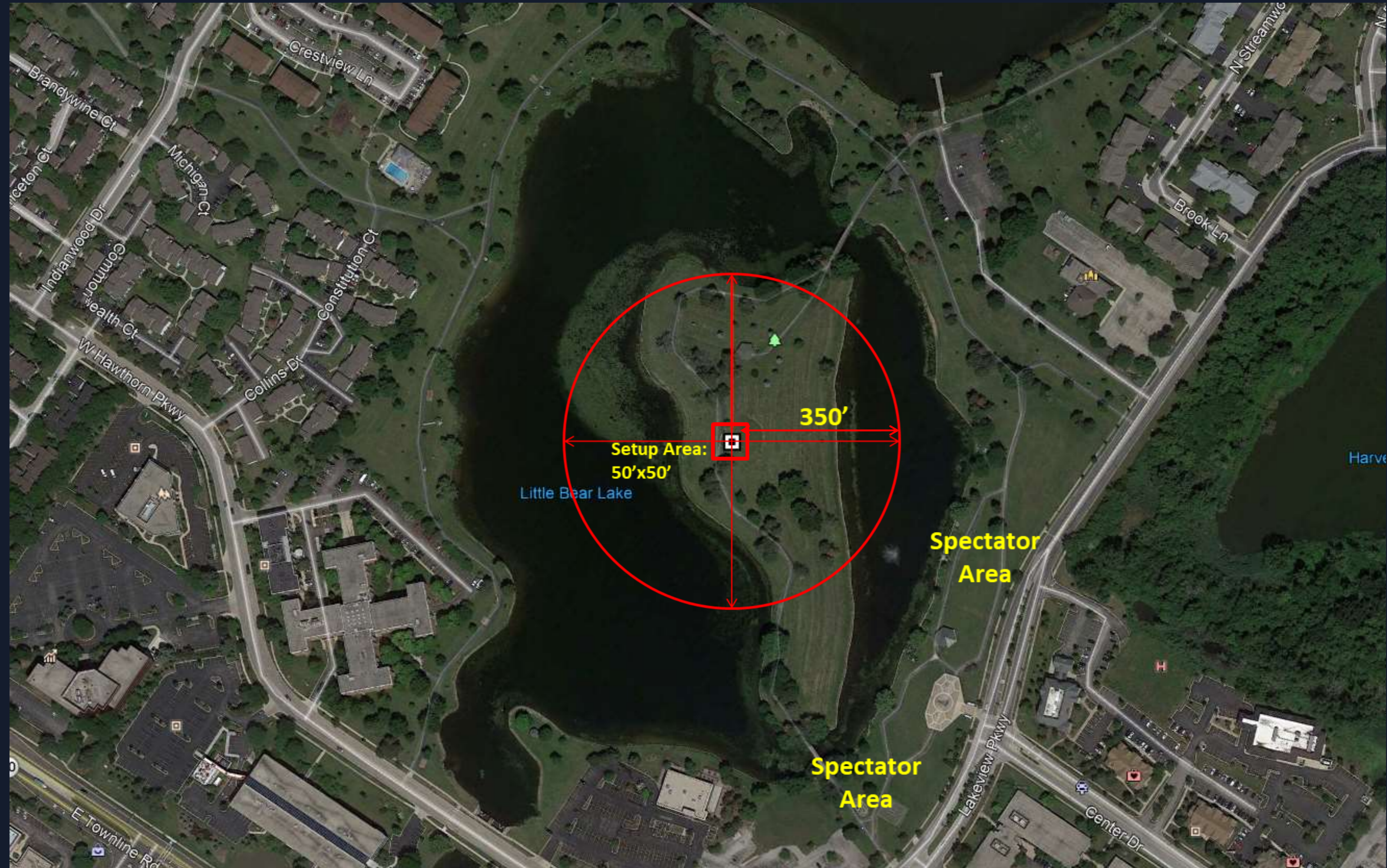
The Show *(continued)*

- Agency - secure a quality sound system if choreographed to music. (proper coverage)
- Prior to the display, the fireworks company must be able to provide you with proof of insurance and all of the necessary permits for the display.
- Provide you a specific site diagram outlining area and range of fireworks
- Provide the fireworks display script – time code of the entire show
- The company should also provide the show music on a format of your choice (CD, USB, Download, etc.)
- They will need to be in contact with you or a designated staff member to coordinate their arrival at the show site, as well as any special needs, such as security.
- At the designated time, the fireworks crew will coordinate the start of the display with your Sound & Production company to ensure proper synchronization.
- Agency - Troubleshoot.....what could go wrong and what would you do?

Script Example

Cue	Ref	Bin	Qty	Effect	TIME	PFT
0			0	MWR 7-4-2019	00:04:00	0.00
1	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	01:18:04	3.40
2	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	01:21:06	3.40
3	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	01:24:05	3.40
4	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	01:27:03	3.40
5	04J014	069	1	PURPLE GREEN DAHLIA W/WHITE STROBE PISTIL	01:30:08	3.20
6	04J014	069	1	PURPLE GREEN DAHLIA W/WHITE STROBE PISTIL	01:33:06	3.20
7	04J014	069	1	PURPLE GREEN DAHLIA W/WHITE STROBE PISTIL	01:36:04	3.20
8	04J014	069	1	PURPLE GREEN DAHLIA W/WHITE STROBE PISTIL	01:39:03	3.20
9	04N006	078	1	GREEN COCONUT W/GREEN TAIL	01:41:29	3.40
10	04N006	078	1	GREEN COCONUT W/GREEN TAIL	01:44:27	3.40
11	04N006	078	1	GREEN COCONUT W/GREEN TAIL	01:47:26	3.40
12	04N006	078	1	GREEN COCONUT W/GREEN TAIL	01:50:21	3.40
13	04J007	062	1	TWILIGHT GLITTER CHRY W/WHITE PALM PISTIL	01:53:19	3.40
14	04J007	062	1	TWILIGHT GLITTER CHRY W/WHITE PALM PISTIL	01:56:18	3.40
15	04J007	062	1	TWILIGHT GLITTER CHRY W/WHITE PALM PISTIL	01:59:16	3.40
16	04J007	062	1	TWILIGHT GLITTER CHRY W/WHITE PALM PISTIL	02:02:15	3.40
17	04I031	053	1	BLUE UMBRELLA W/LEMON STROBE PISTIL	02:05:26	3.10
18	04I031	053	1	BLUE UMBRELLA W/LEMON STROBE PISTIL	02:08:24	3.10
19	04I031	053	1	BLUE UMBRELLA W/LEMON STROBE PISTIL	02:11:22	3.10
20	04I031	053	1	BLUE UMBRELLA W/LEMON STROBE PISTIL	02:14:17	3.10
21	04N009	081	1	AQUA PEONY W/SILVER COCONUT PISTIL	02:17:10	3.30
22	04N009	081	1	AQUA PEONY W/SILVER COCONUT PISTIL	02:20:08	3.30
23	04N009	081	1	AQUA PEONY W/SILVER COCONUT PISTIL	02:23:10	3.30
24	04N009	081	1	AQUA PEONY W/SILVER COCONUT PISTIL	02:26:05	3.30
25	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	02:29:04	3.40
26	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	02:31:29	3.40
27	04J006	061	1	TWILIGHT GLITTER CHRY W/PURPLE PALM PISTIL	02:35:01	3.40
28	04N003	075	1	GREEN CROSSETTE	02:37:26	3.40
29	04N003	075	1	GREEN CROSSETTE	02:40:25	3.40
30	04N003	075	1	GREEN CROSSETTE	02:43:20	3.40
31	04N003	075	2	GREEN CROSSETTE	02:46:18	3.40
32	04N003	075	2	GREEN CROSSETTE	02:49:20	3.40
33	04N003	075	2	GREEN CROSSETTE	02:52:18	3.40
34	25T005	-----	1	+130 Z GREEN STROBE / YELLOW TWINKLING & BLUE MINE	02:57:26	1.00
35	05N005	173	1	RED & GREEN CRACKLING COCO TREE W/WHITE STROBE	02:58:26	3.50

Site Diagram Example



Launch Location: 

Setup area Dimensions: 50'x50'

Rack banks are parallel to path. South end of banks are 10 Ft. north of evergreen trees.

Show Name: M.W.R. Naval Station Great Lakes
Location: 2601 A. Paul Jones Street Great Lakes, IL
Date Created: 5/20/19

Fall-Out Radius: 350'
Distance To Audience: 500'



Launch Location:



Setup area Dimensions: 50'x75'

BING
BANG
BOOM!

Part 10

The Re-Cap



The Re-Cap

- Become your agencies SME and “producer” for Fireworks Displays.
- Develop a realistic budget with realistic expectations.
- Don’t pick a fireworks vendor based on the number of shells alone.
- Right-Size the Show.....not every show can or should be 30 minutes long.
- Look at their references and track record to decide which vendor is best suited to you and your audience. -BEST VALUE-
- Know your audience, develop a display that works best for you and your event!
- Look to use “fillers” or added enhancements to extend a show when possible.
- Use narration to set the tone and to recognize sponsors/agency.
- If possible, create a long-term partnership with your vendor based on trust.
- If you can, take time to enjoy the Fireworks yourself-**You Earned It!**

BING
BANG
BOOM!



**THE ANATOMY
OF A
GREAT FIREWORKS
DISPLAY**



Questions???

Feedback Please!



Bonus Material

The Top Ten List – Fireworks Music

(Personal Opinion Only-No Particular Order)

- Thunderstruck - ACDC
- Great Balls Of Fire - Jerry Lee Lewis
- Stars & Stripes Forever - J.P Sousa
- What A Wonderful World - Louis Armstrong
- America the Beautiful - Ray Charles
- Courtesy of the Red, White & Blue - Toby Keith
- Let's Go Crazy - Prince
- Amazing Grace - Dropkick Murphy's
- Music Of The Night - Phantom Of The Opera
- The House Is Rocking - Brian Setzer

There are so many factors that go into which songs work the best- the venue, the theme of the show, the demographics of the audience and length of the show all play a factor. Always remember the tempo of the show....MIX IT UP!