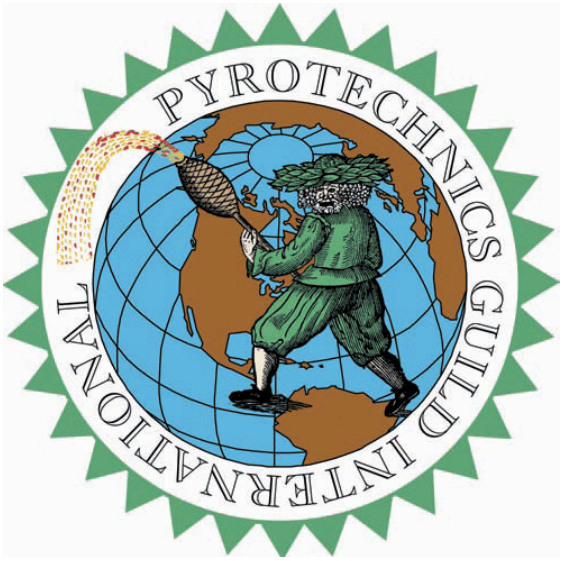
PGI Convention

Competition Rules



Pyrotechnics Guild International, Inc.
2019

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1. Competition Overview

The competition section of each PGI Convention is intended to foster interest and develop the skills of the membership in the construction and/or display of pyrotechnic devices, and to give all members a chance to admire, study, and better understand those devices. The overall competition is divided into three divisions for member-built pyrotechnics and one division for commercially produced items. The divisions are:

1. Aerial Shell Competitions
2. Rocket Competitions
3. Ground Competitions
4. Class C Competitions

Within the divisions, there are two types of competition, "Level" and "Best". The "Level" competitions are intended to allow competitors to demonstrate steadily increasing knowledge of the craft from novice to expert. The "Best" competitions are ones in which all competitors attempt to build the best examples possible of a particular device.

Trophies are awarded for first and second place in "Level" competitions and first place in "Best" competitions. A trophy will be awarded for second place in "Best" competitions when there are more than six competitors in that competition. In all cases, a minimum score of at least 4.6 must be acheived for a trophy to be awarded.

"It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither know victory or defeat."

Teddy Roosevelt

3. Special Awards

Grand Master

The Grand Master award is intended by the PGI to recognize the competitor who has best demonstrated an overall excellence with pyrotechnic device invention, implementation, and display for the current year.

All competitors who enter any competition are automatically entered into competition for the Grand Master award. Each event has a Grand Master Point Code assigned and points assigned for the first five places based on the table below. In order to assure that entries are of above average quality, Grand Master points will only be earned by entries scoring 5.6 or above. Points will be accumulated from the two competitions from each division in which the competitor scores the most Grand Master points. In competitions that allow multiple entries, only the highest scoring entry will be eligible to contribute Grand Master points. The entrant with the most total Grand Master points will receive the award. In case of a tie, the Judging Panel will select the winner.

		Place				
		1	2	3	4	5
Code	A	50	40	30	20	10
	B	40	32	24	16	8
	C	30	24	18	12	6
	D	20	16	12	8	4
	E	10	8	6	4	2

Life Master

Once a competitor has won Grand Master three times, that person becomes Life Master. A Life Master is no longer eligible for Grand Master but may still compete as previously.

Bill & Sue Hoyt Prize

At each year's convention the guild officers have the option of awarding the Bill and Sue Hoyt Prize if a truly marvelous shell is fired in any of the regular competitive categories. The criteria for this award are:

"Monumental shells, shells outstanding for their type, shells which perform perfectly, shells which are not dependent on being part of the show, shells which shot all by themselves would make Bill and Sue happy."

This prize is in cash from the Bill & Sue Hoyt Trust fund. The decision to award the Bill & Sue Hoyt Prize is made by the officers of the PGI.

Gerry Gits Challenge

The Gerry Gits Challenge, named in memory of our beloved Chief Judge Gerry, is a special competition whose definition changes each year. The definition of the Challenge is decided by the judges and is published in the PGI Bulletin, and posted on the PGI web site. This competition carries no Grand Master points.

Best First Time "B" Competitor

Awarded to the "best achievement of an effect" put forward by any first time competitor in any of the class B competitions.

Best First Time "C" Competitor

Awarded to the "best overall use of class C in a display" presented by a first time competitor in a class C competition. Judgment will be made on the best use overall of Class C devices. The presentation should have an introduction, include a theme or motif, and end in a definite termination - just using every Class C device known to man will not guarantee a win.

The Club Trophy

Each competitor who designates his or her entry in competition as a member of a given club is eligible for participation in the competition for club trophy. Each of these competitors who place 1st, 2nd, or 3rd in any "level" or "best" will earn 3, 2, or 1 points, respectively. Only the one best result - whether 3, 2, or 1 - may go toward the club trophy from each competitor.

2. General Rules

Competitor Eligibility

1. All competitors shall be Full or Junior members in good standing, attend the PGI Convention and must have signed a release form.
2. No active working professional in pyrotechnics manufacture may enter any Level 1 or 2 category or Level 3 Aerial. A working professional is defined as anyone who has worked for more than a year under the direct supervision of a production manager or owner of an ongoing pyrotechnic company or derives more than one third of his income from a commercial pyrotechnic enterprise.
3. All entries must be in a single name with the exceptions of Best Lance Piece, Ground Levels, Best Movie Special Effect, and Class C.
4. For all "Level" competitions, any competitor who has received a first place trophy in any Level 1 or 2 competition or Level 3 Aerial must move up at least one level in subsequent years. Once a competitor has won:
   -Level 3 or 4 in a rocket level competition, they are no longer eligible to compete in Level 1 or Level 2 rockets.
   -Level 2 or 3 in ground level competition, they are no longer eligible to compete in Level 1 ground.
   -Level 4, 5, or 6 in aerial level competition, they are no longer eligible to compete in Level 1, 2, or 3 aerial.
5. A competitor may enter any number of divisions (i.e., Aerial, Rockets, etc.). A competitor may enter at most one "Level" competition in each division. The competitor may enter as many of the "Best" competitions as they want.
7. All competitors are required to attend the General Competitors Meeting on Sunday of the convention. In addition, competitors must attend the Daily Competitors Meeting on those days when they have a competition scheduled. A competitor's non-attendance at the meeting may result in disqualification from the contest.

Device Requirements

1. Except as otherwise noted, all devices are to be made entirely by the entrant. Commercial products allowed in all competitions are:
   - Black powder
   - Quickmatch and Blackmatch
   - Time fuse
   - Electric matches
   - Cardboard cylinders, tubes, and disks
   - Round shell casings
2. "Best" competitions: Except where otherwise noted, "best" devices will be submitted in pairs. An entrant may enter any number of "best" competitions, but may only submit one entry to each competition with the exception of the Large and Exhibition shell competitions, which may be entered up to three times.

Competition Conduct

1. All devices entered in divisions other than Class C (Division 4) must have descriptions of intended effects supplied to the Competition Registrar in writing on 8 1/2 by 11 sheets or specially prepared forms for those descriptions. These written descriptions must be given to the Competition Registrar no later than noon on the day of the competition. In order to facilitate planning, it is strongly recommended that entries be submitted as early as possible, with pre-convention submission via the PGI web site being the best.
2. Competitors are requested to make arrangements with the Competition Site Chairman regarding equipment requirements for their entry.
3. Each competitor may have assistants to help with their entry. These assistants will facilitate efficient set-up, firing, and/or provide assistance with announcing the described effects.
4. The Judges and Competition Site Chairman may at their discretion require that pairs of devices in some "best" competitions be shot simultaneously.
5. Each competitor is responsible for the clean up and removal of his or her entry.

Safety

1. Each competitor must not endanger spectators, other competitors, or other competitors' entries.
2. The Safety Committee may inspect items to be fired in any of the competitions. The committee may disallow certain devices and may even terminate an entire entry. The decision of the Safety Committee to reduce the number of devices or remove any allowable entry in any category as a result of shooting site safety considerations will be overriding.
3. No reloading of aerial devices is permitted in any competition. If the competitor is firing special size devices, they must have either arranged with the Competition Coordinator for availability of mortars or must supply adequate mortars themselves. PVC and ABS mortars are not allowed in any competition.
4. ***Many of the competitions have device limitations defined in the Device Specifications section that may only be exceeded with the specific approval of the safety team. Competitors whose devices require safety approval MUST have their entry forms submitted to the competition registrar by Noon on Sunday of the convention. These competitors will then be able to pick up a safety approval form for their entry at the General Competitors Meeting. This form must then be taken to the safety review meeting scheduled for later Sunday afternoon at the magazine. Members of the safety team will go over the proposed entry, and if they deem it safe for competition, they will sign the form. These forms must then be returned to the Competition Registrar who will release the entry into the competition system.***

4. Competition Specifications

Division 1: Aerial Shell Competition

Definitions:

An **aerial shell** is a device propelled into the air to produce a visual and/or audible effect. It receives its primary motive force from the use of a lifting charge in a mortar tube or similar device.

Equipment Specifications:

Mortars: 3", 4", 5", 6", 7", 8", 10", 12" and 16" diameters will be provided. Competitors requiring mortars of other diameters or lengths should contact either the Convention Chairman or Competition Site Coordinator to arrange for those sizes. The provided mortars will be no smaller than the stated diameter, but they may be $^1/_{32}$" oversize for every inch of diameter. In no case should the diameter be more than ¼" over. Additional specifications for mortars may be set by the Safety Committee.

Device Specifications:

1. Ground and rocket effects are not allowed in any competition.
2. In all competitions the shells must be made entirely by the competitor, including components and inserts such as whistles, serpents, tourbillions and any other elements of the shell that produce a visual or audible effect. Commercial fuse (for timing purposes only, not as an effect), black powder, tubes, discs, and round shell casings are allowed in construction at all levels. Exception: in Division 1-AB Best Beginner Shell, purchased stars and inserts are allowed.
3. No commercial Class C devices may be used in any competition unless specifically allowed.
4. Garnishments (such as ascending comet tails, whistles, ascending small flower shells, ascending separating comets, etc.) but NOT reports up to one-third of the shell diameter are permitted.
5. Report maximum sizes will not exceed the diameter of the shell in length.
6. Except when the Chief Judge approves for artistic reasons, shells that have a single report as their basic effect are not permitted in any competition. Acceptable exception: colored report.
7. Number of shells, required effects, and maximum shell sizes in aerial competition are:

		Number	Effects	Single Break	2 Breaks	3 Breaks	4 Breaks	> 4 Breaks
Level	1	4	n/a	3"	N/A	N/A	N/A	N/A
	2	4	3	4"	3"	N/A	N/A	N/A
	3	4	3	6"	5"	4"	3"	N/A
	4	4	3	8"	7"	6"	5"	4"
	5	4	3	10"	8"	7"	7"	6"
	6	4	3	Site Limit	Site Limit	Site Limit	Site Limit	Site Limit

8. Where "single break" is a limiting factor, the length of the shell body must not exceed twice the width of the mortar for the shell.
9. Where "multi break" is a limiting factor, the length of the shell body is limited to 1.5 x mortar-diameter x number of breaks. For example, a 4" two-break shell length is limited to 1.5 x 4 x 2 = 12". There are no length restrictions for level 4 and above.
10. Definitions of multiple-break shells, stacked or piled shells, and component shells:

    - Multiple-break shells are those which have the appearance of a single shell, but are composed of 2 or more adjacent cylinders of ostensibly equal diameter. Each break that succeeds the initial break takes its fire from the preceding break. A bottom shot is counted as a break.
    - Piled shells are those consisting of separate devices, usually spherical, all of which take fire from the lift charge. A stack is considered multi-break with each individual device being a separate break.
    - Component shells are those in which devices within a break take fire from the burst charge of the break. The components are limited to an o.d. less than ½ the i.d. of the shell. Component shells are allowed in any level.

    For clarification, a 4" shell would be considered multi-break under any of the following conditions:

    - Two or more integrally joined 4" shells
    - Two or more piled shells of 4" or smaller diameter
    - Shell body longer than 8"
    - When an internal component o. d. exceeds 1-3/4"

11. Some levels require effects as defined in the following list:

    - Comets, includes crossettes
    - Small reports such as saettines, lambettis, fusilading or cannonade
    - Timed items, such as draw-out or timed reports
    - Flying or spinning items such as serpents or tourbillions
    - Patterns such as puppadels or double-petalled peony
    - Audible effects such as hummers or whistle
    - Fancy or unusual color
    - Multiple-break as defined in device specifications
    - Unique effects not covered in preceding categories

12. ***All shells 4" and larger with more than two breaks must have safety inspection and approval.***

Aerial Shell Competitions

Competition 1-1: Aerial Level 1 (Beginner)

This level is intended for beginning shell makers to gain experience in competition. Exactly 4 shells must be entered at this level. Shells must be single-break 3" diameter, with a maximum length of 5". Component shells are permitted, but reports may not be used as components. Grand Master Point Code "E"

Competition 1-2: Aerial Level 2 (Novice)

Exactly 4 shells must be entered at this level. Shell maximums are 4" single-break, and 3" 2-break. Reports may not exceed 2½" x 2½" o.d. Grand Master Point Code "D"

Competition 1-3: Aerial Level 3 (Intermediate)

Exactly 4 shells must be entered at this level. Shell maximums are 6" single-break, 5" 2-break, 4" 3-break, and 3" 4-break. Reports must not exceed 3½" x 3½" o.d. Grand Master Point Code "C"

Competition 1-4: Aerial Level 4 (Advanced)

Exactly 4 shells must be entered in this level. Shell maximums are: 8" single-break, 7" 2-break, 6" 3-break, and 5" 4-break, and 4" and smaller any number of breaks. At least 2 shells must exceed maximum size, either in diameter or number of breaks, for level 3. GM code point "B"

Competition 1-5: Aerial Level 5 (Exhibition)

Exactly 4 shells must be entered in this level. Shell maximums are: 10" single-break, 8" 2-break, 7" 4-break, and 6" and smaller any number of breaks. At least 2 shells must exceed maximum size, either in diameter or number of breaks, for level 4. GM code point "A"

Competition 1-6: Aerial Level 6 (Expert)

Exactly 4 shells must be entered in this level. Size maximums for this level are site specific, however at least 2 of the shells must exceed maximum size, either in diameter or number of breaks, for level 5. GM code point "A".

Competition 1-AB: Best Beginner Shell

This category is intended to give first time shell builders a chance to compete. Competitors entering this competition may not enter any other Aerial competitions. Shells must be 3" single break. Component shells are permitted, but reports may not be used as components. Judges will score the shell performance (break height, pattern, etc.) rather than the components. Competitors in this category only may use purchased stars and inserts. Grand Master Code "E"

Competition 1-AA: Best Miniature Shell

Shells must be no larger than 2" nominal diameter (mortar inside diameter no larger than 2"). Mortars must be supplied by the competitor and approved by the safety committee. No reloading is permitted. Grand Master point code is "C"

Competition 1-A: Best Small Shell

All shells in this competition must be 4" single-break or 3" multi-breaks. Grand Master Point Code "C"

Competition 1-B-B: Best Medium Ball Shell

All 5" single-break ball shells and 4" stacked ball shells are in this competition. Grand Master Point Code "C"

Competition 1-B-C Best Medium Cylinder Shell

All 5" single-break and 4" multi-break cylinder shells are in this competition. Grand Master Point Code "C"

Competition 1-C-B: Best Medium Large Ball Shell

All 6" single-break ball shells and 5" stacked ball shells are in this competition. Grand Master Point Code "C"

Competition 1-C-C: Best Medium Large Cylinder Shell

All 6" single-break and 5" multi-break cylinder shells are in this competition. Grand Master Point Code "C"

Competition 1-D-B: Best Large Ball Shell

All 7" or 8" single-break ball shells and 6" stacked ball shells are in this competition. Pairs are not required in this competition. Grand Master Point Code "C"

Competition 1-D-C: Best Large Cylinder Shell

All 7" or 8" single-break and 6" multibreak cylinder shells are in this competition. Pairs are not required in this competition. Grand Master Point Code "C"

Competition 1-E-B: Best Exhibition Ball Shell

All single-break ball shells larger than 8" and all stacked ball shells larger than 6" are in this competition. Pairs are not required in this competition. Grand Master Point Code "C"

Competition 1-E-C: Best Exhibition Cylinder Shell

All single-break cylinder shells larger than 8" and all multi-break cylinder shells larger than 6" are in this competition. Pairs are not required in this competition. Grand Master Point Code "C"

Division 2: Rocket Competition

Definition:

A rocket is a reaction motor that rises into the air with a controlled trajectory stabilized by fins, balance stick, or spinning.

Equipment Specifications:

Rocket racks are provided by the PGI, however entrants may supply their own racks and associated equipment to meet special needs. All racks supplied by the entrant must be sturdily constructed to prevent tipping. Racks and equipment will be inspected by the Safety Committee, and additional specifications for such equipment may be set by the Safety Committee. Only one re-light attempt is allowed for each competitor in a level. (i.e. if 1 or more of the competitor's rockets fails to light, only one of the rockets will get a re-light attempt)

Device Specifications (Rockets):

1. Ground effects designed to ignite before the rocket leaves the launching rack are not allowed.
2. Mortar firing or assists for purposes of aiding the rocket to leave a launching device are not allowed.
3. Excluding black powder, fuse (for timing purposes only, not as an effect), cases and tubes, the rocket motor must be made entirely by the competitor.
4. Reports will have a maximum inside diameter (I.D.) apporoximately equal to the outside diameter (O.D.) of the rocket body, only large enough to allow for a slip fit over the end of the rocket tube - none larger.
5. When permitted, batteries are considered to be a single device.
6. Standard rockets can have only one motor burning at a time. Caduceus rockets can have two, and only two, motors burning at a time. A caduceus rocket is considered to be one device in all rocket competitions.
7. All rocket levels have required effects as defined in the following list:
   Tail:
   - Charcoal
   - Glitter
   - Whistle
   - Strobe
   - Other Innovative Effects

   Heading:
   - No headings are permitted on Caduceus rockets smaller than i.d. 1"
   - Multiple-breaks
   - Timed items
   - Flying or spinning effects
   - Comets, includes crossettes
   - Audible effects such as reports (No report headings are permitted on any Caduceus rockets)
   - Audible, non-report items such as whistles
   - Fancy or unusual color
8. Number of rockets and required tail/heading effects:

Level	Number	Tail Effects	Heading Effects
1	4	1	2
2	4	2	3
3	6	2	3
4	6	2	3

9. ***All rockets larger than 1½" i.d. must have safety inspection and approval.***

Device Specifications (Girandolas):

1. Flights of up to 6 girandolas may be fired as a single entry, however they must be fired in close sequence.
2. A multi-stage girandola is considered as one device as long as all stages leave the launch pad attached and at the same time. On a multi-stage girandola the limit on number of vertical drivers is for all drivers on the device.
3. Reports are allowed only in the Unlimited category, and will have a maximum internal diameter equal to the diameter of the driver bore.
4. Cored drivers are allowed only in the Unlimited category.
5. ***All girandolas in the Unlimited competition must have safety inspection and approval.***

Equipment Specifications (Girandolas):

Competitors are responsible for providing and setting up appropriate launch equipment for their girandolas.

Girandola Vertical Driver Limitations

	⅝"	¾"	⅞"	1 - 1¼"	> 1¼"
Small	16	12	8	not allowed	not allowed
Large	36	24	16	8	not allowed
Unlimited	unlimited	unlimited	unlimited	unlimited	unlimited

Rocket Competitions

Competition 2-1: Rocket Level 1 (Novice)

Maximum rocket motor i.d. is ⅝" for standard rockets or ½" for each of two motors shot as a single Caduceus rocket. No batteries are permitted in this level. Rockets must be stabilized by balance sticks only. Grand Master Point Code "E"

Competition 2-2: Rocket Level 2 (Intermediate)

Maximum rocket motor i.d. is ¾" for standard rockets or ⅝" for each of two motors shot as a single Caduceus rocket. No batteries are permitted in this level. Grand Master Point Code "D"

Competition 2-3: Rocket Level 3 (Advanced)

Maximum rocket motor i.d. is 1¼". for standard rockets or 1" for each of two motors shot as a single Caduceus rocket A total of 6 entries is required. Each entry must not exceed a battery of 15 devices. The total number of devices for all 6 entries must be at least 6 and no more than 34 devices. A battery must be fired in close sequence. Grand Master Point Code "B"

Competition 2-4: Rocket Level 4 (Expert)

Although there is no specific limit on rocket motor size any rockets with a bore larger than 1½" for standard rockets or 1¼" for a Caduceus rocket must have prior Safety approval. All else is the same as level 3. Grand Master Point Code "A"

Competition 2-A-S: Best Small Rocket

Maximum rocket motor i.d. is ¾". Grand Master Point Code "C"

Competition 2-A-M: Best Medium Rocket

Rocket motor bore must be larger than ¾" and no larger than 1¼". Grand Master Point Code "C"

Competition 2-A-L: Best Large Rocket

Rocket motor bore must be larger than 1¼". Any rockets with a bore larger than 1½" must have prior Safety approval. Grand Master Point Code "C"

Competition 2-C-S: Best Small Rocket Motor

Maximum rocket motor i.d. is ¾". for standard rockets or ⅝" for each of two motors shot as a single Caduceus rocket. Entrant must make all compositions used in the rocket. The only heading allowed is a report to track a standard rocket's apogee. Report is limited to 21 grams composition/flash weight. No heading is allowed on Caduceus rockets. Grand Master Point Code "D"

Competition 2-C-M: Best Medium Rocket Motor

Rocket motor bore must be larger than ¾" and no larger than 1¼" for standard rockets or larger than ⅝" and no larger than 1" for each of two motors shot as a Caduceus rocket. Entrant must make all compositions used in the rocket. The only heading allowed is a report to track the standard rocket's apogee. Report is limited to 60 grams composition/flash weight. No heading is allowed on Caduceus rockets. Grand Master Point Code "D"

Competition 2-C-L: Best Large Rocket Motor

Rocket motor bore must be larger than 1¼" for a standard rocket or larger than 1" for each of two motors shot as a Caduceus rocket. Any rockets with a bore larger than 1½" for standard rockets or larger than 1¼" for Caduceus rockets must have prior Safety approval. Entrant must make all compositions used in the rocket. The only heading allowed is a report to track the rocket's apogee. Report is limited to 60 grams composition/flash weight. Grand Master Point Code "D"

Competition 2-D-S: Best Small Girandola

Vertical drivers may not be more than ⅞" in diameter, and are restricted in quantity according to the table on page 8 No cored drivers or reports allowed. Grand Master Point Code "C"

Competition 2-D-L: Best Large Girandola

Vertical drivers may not be more than 1¼" in diameter, and are restricted in quantity according to the table on page 8. The nunber of vertical drivers must exceed the limit for Best Small Girandola either in size or number of drivers. No cored drivers or reports allowed. Grand Master Point Code "C"

Competition 2-D-U: Best Unlimited Girandola

No explicit restrictions on drivers or headings, however all girandolas in this category must have safety review and approval. The nunber of vertical drivers must exceed the limit for Best Large Girandola either in size or number of drivers. Grand Master Point Code "C"

Division 3: Ground Competition

Definitions:

A **ground display** produces its primary effects on the ground or beginning on the ground. Devices suitable to a ground display include: fountains, gerbs, wheels, tourbillions, candles, waterfalls, mines, comets, set pieces, whistles, towers, castles, line rockets, girandolas and possibly other low level effects.

Display is the operative word and the judges will be looking for a coherent and entertaining display. A simple "product demo" of the minimum number of devices should not be expected to get a good score.

A **mine** consists of stars, crackers, reports, whistles, hummers, serpents, bees or any other effect or combination of effects ignited and ejected upward into the air from a single mortar. The individual effects are ignited and loose upon ejection.

A **gerb** or **fountain** is a stationary single case which may be choked and is charged with a composition, which when ignited, shoots fire and/or sparks into the air.

A **comet** is a single projectile which is fired into the air and is designed to produce a visible effect during flight. It receives its sole motive force from the use of a lifting charge in a mortar tube or similar device.

A **wheel** is a spinning device with one or more axes of rotation. Propulsion of the wheel must be by pyrotechnic device. Multiple wheels will be allowed and count as one wheel if attached to a common main frame.

A **roman candle** is a single device which repeatedly fires projectiles into the air from a single tube.

A **lance piece** is a pictorial pyrotechnic depiction primarily by the use of lance.

A **set piece** is a pyrotechnic depiction of a design, using gerbs, saxons, wheels, lance and/or roman candles.

A **movie special effect** is a device that creates smoke, fire, or noise, or any combination of smoke, fire and noise. Such a device may be placed on a building, vehicle, or in the air. The intention of such a device is to simulate the use of munitions, explosives, or the explosion of fuel or a fire and explosion with little or no effect to the target while giving the illusion of great destruction or damage. Equipment may be inspected by the Safety Committee prior to the entrant's exhibition.

Equipment Specifications (Ground Displays):

Competitors are requested to make arrangements in advance with the Competition Site Coordinator regarding requirements for their entries. All supports, guy-wires, and equipment will be sturdily constructed to prevent devices from falling or becoming loose. Equipment may be inspected by the Safety Committee prior to the entrant's exhibition.

Equipment Specifications (Comets):

For comets smaller than 3", the entrant must provide enough mortars to fire their entire entry - no re-loading will be permitted.

Equipment Specifications (Movie Special Effect):

No effect involving a person will be allowed. All frames, hardware or false fronts will be sturdily constructed and staked in a manner that will prevent their tipping. Mortars, flash pots, or compressed air mortars will in no circumstances be attached to any frame, false front or similar construction at a height greater than 5' above the ground. The Safety Committee will inspect all devices prior to exhibition. Metal pots with sound or flash bags are prohibited unless approved by Safety Committee.

Device Specifications (All Ground Division Competitions):

1. Commercial lance, fuse (for timing purposes only, not as an effect), black powder, cases, and tubes are allowed in all competitions. Unless specifically allowed, all other components must be made entirely by the entrant.

Device Specifications (Ground Displays):

1. Small aerial shells not to exceed 2½" o.d. are allowed but can only be used to augment the ground effects.
2. Reports are limited to 2½" x 2½" o.d.
3. Line rockets are permitted.
4. There is no upper limit on the number of devices, however the competitor should observe a time limit of 7 minutes.
5. All mines will be fired from non-metal mortars only. This rule will be strictly enforced by the Safety Committee. Any competitor found in violation of this rule will be disqualified.

Device Specifications (Comets):

1. *Comets larger than 1½" with auxiliary effects other than crossette-type "split comets" must have safety inspection and approval.*

Device Specifications (Mines):

1. All individual effects comprising a mine shall be housed in a mine bag. Mine bag height shall not exceed twice the diameter of the mine bag.

Device Specifications (Movie Special Effect):

1. No reports larger than 2½" x 2½" o.d. will be used on any set or prop, and under no circumstances will reports be allowed on the ground.
2. No more than five fluid ounces of flammable liquid will be used on any device except with approval of Safety Chairman.
3. Under no circumstances will any device which causes shrapnel, i.e. electric or fuse type blasting caps, be used at any time – NO EXCEPTIONS. This does not preclude the use of electric squibs. Sound or flash loads must be in paper pots only unless approved by Safety Chairman.
4. Duration of the devices will be limited to 10 minutes. No minimum time limit.
5. At the discretion of the Safety Committee, an unlimited number of devices may be used.

Ground Competitions

Competition 3-1: Ground Display Level 1 (Novice)

This display must consist of at least 10 total devices, representing at least 5 distinct device types. See chart on page 11 for restrictions on individual device sizes. Grand Master Point Code "C"

Competition 3-2: Ground Display Level 2 (Intermediate)

This display must consist of at least 15 total devices, representing at least 6 distinct device types. At least 1 device must be a wheel, girandola, lance piece, set piece, or falls. See chart on page 11 for restrictions on individual device sizes. Grand Master Point Code "B"

Competition 3-3: Ground Display Level 3 (Advanced)

This display must consist of at least 30 total devices, representing at least 7 distinct device types. At least 2 device types must be from the list of wheel, girandola, lance piece, set piece, or falls. See the chart on page 11 for restrictions on individual device sizes. Grand Master Point Code "A"

Competition 3-A-S: Best Small Gerb

Gerb i.d. must not exceed 1½". Grand Master Point Code "D"

Competition 3-A-L: Best Large Gerb

Gerb i.d. must exceed 1½" but must not exceed 3". Grand Master Point Code "D"

Competition 3-B-S: Best Small Comet

Comet must be no larger than 2" nominal diameter (mortar inside diameter no larger than 2"). Complex comets, such as those changing color, terminating with a report, or other auxiliary effects are allowed. The maximum weight of the auxiliary portions of complex comets may not exceed 50% of the total. Grand Master Point Code "D"

Competition 3-B-L: Best Large Comet

Comet o.d. must be larger than 2" but no larger than 3". Auxiliary effects other than crossette-type "split comets" must have safety approval. Grand Master Point Code "D"

Competition 3-B-U: Best Unlimited Comet

Comet o.d. must be larger than 3". Auxiliary effects other than crossette-type "split comets" must have safety approval. Grand Master Point Code "D"

Competition 3-C: Best Wheel

Only a single wheel is required per entry. Maximum driver i.d. is 1¼". Wheels may contain any number of smaller wheels, and other auxiliary effects. Reports are limited to 3" o.d. Wheel supporting hardware and wheel frames may be commercially obtained. Grand Master Point Code "C"

Competition 3-E: Best Roman Candle

The maximum i.d. of a candle is 2". Each candle must have a minimum of three projectiles, there is no maximum number. A candle is a single tube device. Multiple tube devices are not permitted. No self-propelled projectiles or reports exceeding 3 grams are allowed. Grand Master Point Code "D"

Ground Competition Requirements and Limitations

		Device Types (2) (3)	Devices (1)	Wheels (o.d.)	Girandola (drivers)	Lance Piece (lances)	Set Piece (items)	Falls (tubes)	Comets (o.d.)	Candles (i.d.)	Gerbs (i.d.)	Mines (o.d.)	Drivers (i.d.)	GMPC
Level 1 Novice	Min	5	10	12"	4	20	6	6						D
	Max				12				2"	1"	2"	3"	¾"	
Level 2 Intermediate	Min	6	15	24"	8	40	8	6						C
	Max								2"	1"	2"	3"	¾"	
Level 3 Advanced	Min	7	30	36"	12	60	10	6						B
	Max								unlim.	unlim.	unlim.	unlim.	unlim.	

i.d. inside diameter
o.d. outside diameter
GMPC Grand Master Point Code
(1) The total number of individual devices, including multiples of the same device (Lance and Set Pieces count as single devices).
(2) Level 2 requires at least 1 Wheel, Girandola, Lance Piece, Set Piece, or Falls.
(3) Level 3 requires at least 2 device types of Wheel, Girandola, Lance Piece, Set Piece, or Falls.

Competition 3-F: Best Lance Piece

At least 1 gross of lance must be used, while there is a maximum of 4 gross. Lance must be the primary portion of the depiction, however some ancillary effects may be used. Examples: small pinwheels as a wheel on a car, or candles as cannons for battling tanks. These ancillary effects may be commercial Class C devices. Grand Master Point Code "D"

Competition 3-G: Best Movie Special Effect

The competitor should have a good working knowledge of special effects before entering this level. A professional background, although not required, is strongly suggested. Other than requirements under Device and Equipment Specifications, there will be no limit on the number or type of devices used. The Safety Committee may inspect all devices prior to entrant's exhibition. Grand Master Point Code "C"

Competition 3-H-S: Best Small Mine

Mines may be up to 4" diameter utilizing only color stars, animated effects and comet type devices. No reports of any size are allowed. Grand Master Point Code "E"

Competition 3-H-L: Best Large Mine

Mines must be larger than 4" and may be up to 6" diameter. Upon approval of safety committee, up to 12 reports not to exceed ¾" i.d. by 1½" length may be used in each device. Grand Master Point Code "C"

Division 4: Class C Competition

The purpose of the Class C Display competitions is not to demonstrate the depth of the competitor's bank account, nor to show how tightly they can pack material into a given area or how far they can stretch what should fit into the definition of "Class C". Instead, these competitions are intended to allow the competitor to demonstrate creativity and artistry in crafting a well thought out display from materials legally available through consumer fireworks distributors to unlicensed club members.

Definition

As used in this section, the term "Class C fireworks" are those fireworks meeting the requirements of APA 87-1, with a valid EX number. Devices classed as 1.4 explosives and labeled as UN0336 or UN0431 may be used provided they meet all the requirements of this section. Fireworks banned in the Code of Federal Regulations Title 16 (CFR 16), CPSC Section 1500.17(a), 1.3 or 1.1 devices, homemade devices, and devices modified beyond the specific provisions of these rules are expressly forbidden.

Inspection

As with all competition categories, devices and display setups are subject to inspection at any time by Safety/Competition personnel, and competitors shall at all times comply with any instructions from Safety, including but not limited to instructions regarding the placement, use or removal of any devices in the display.

Additionally, on the day of any competition, immediately prior to the closing of the field for setup purposes, the Competition Chair may inspect each competitor's display. The Competition Chair may delegate this inspection to suitably qualified individuals, provided that no competitor in the Class C Display competition shall inspect displays in any category (small/large/unlimited) in which they are entered. If, during this inspection, it is determined that one or more aspects of a competitor's display are not in compliance with these rules, that competitor shall immediately bring the display into compliance or that entry shall be disqualified. Any display using any explicitly prohibited devices which may not have been identified during inspection shall also be disqualified.

Equipment Specifications

1. Any commercial UN0336 or UN0431 device or combination of devices meeting the definition above may be used. The only permitted modifications are adjustments to fusing for timing, for chain fusing or to enable the use of permitted electric ignition devices; and removal of nonessential packaging material to allow physical reconfiguration of devices. Any modification involving a change in the amount of pyrotechnic composition in any device is expressly forbidden. Competitors are encouraged to discuss proposed modifications with competition and safety staff in advance to maximize the likelihood of these modifications passing inspection.

2. In any competition, reloading of any type of mortar is prohibited.

3. Commercially manufactured black match, quickmatch, fuse, igniters and electric matches are allowed in all competitions, but may be used only for ignition and timing purposes, not as an effect.

4. There is no limit to the number of devices fired; however, there is a maximum time limit of 5 minutes.

5. Descriptions of effects are not required.

Class C Competitions

Competition 4-A: Best Small Class C Display

The competitor's entry must be in one contiguous area, with a perimeter of no more than 40 feet. Boundary tape will be issued to the competitor to mark the entry. Structures for mounting devices may not exceed 8 feet in height. Grand Master Point Code "E"

Competition 4-B: Best Large Class C Display

The competitor's entry must be in no more than three areas, with a combined perimeter of no more than 100 feet. Boundary tape will be issued to the competitor to mark the entry. Structures for mounting devices may not exceed 12 feet in height. Grand Master Point Code "D"

Competition 4-C: Best Unlimited Class C Display

Space requirements must be worked out with the Competition Site Coordinator. There is no specific limit on display size. Grand Master Point Code "C"

5. Rule Violations, Protests, & Disqualifications

Rule Violations

It is primarily the responsibility of the competitors to assure that their devices meet the specifications for the competition that they are entering. Because of time constraints, it is impractical for the Competition Chairman or the Judges to be expected to identify any but the most flagrant rule violations. It is assumed that PGI members are honorable, and will do their best to compete within the rules.

Protests

Any entrant in a given competition may lodge a protest against another entrant in the same competition. The general PGI membership may not lodge protests.

The Competition Chairman may lodge a protest if in their opinion an entry is in violation of the rules.

Protests must be lodged in writing before noon Thursday. The details of the dispute will be forwarded to the Competition Chairman.

Upon receipt of the written protest, the Competition Chairman will assemble a Protest Committee of three persons. The Protest Committee will decide by a majority vote the proper penalty, if any.

Disqualifications

During the competition there are situations which cause "real time" dilemmas for judges and the safety chairman. For this reason, there are some mandatory conditions for termination of a competitor's entry.

- Whenever any mine, ærial shell, or rocket detonates
- If 2 aerial shells "Flower Pot"
- When 2 rockets, rocket headings, or aerial shells reach the ground before, or without, ignition of contents
- When salutes from 2 devices of any type explode on the ground

The Safety Chairman has discretionary powers to disqualify any entry. The above should remove most subjective judgements. Other reasons for disqualification could be when a competitor's devices have dangerous amounts of their contents reaching the ground while lit.

Lack of Expected Quality

In order to maintain a high standard of excellence and accomplishment, it will be at the Judges' discretion to recommend that a trophy not be awarded and master points not be distributed for a given category. An instance which might warrant such a recommendation would be an entry that shows an overall lack of expected quality. Such determination shall be made by the judges before the end of that nights competition. The Chief Judge will convene a Protest Committee of three persons one of which shall be the Chief Judge. The Protest Committee will decide by a majority vote whether the trophy and master points will be awarded.

6. Strategies For Winning the PGI Competition

The intent of this chapter is to help the competitor and spectator to better understand the competition judging process, and to improve enjoyment of the competition for all.

Scoring

The system used in scoring is similar to that used in the Olympics to judge gymnastics or diving. The evaluator, the judge, observes the performance and assigns a value. The judge's knowledge and experience of the art is the basis for the valuation. It is a subjective appraisal of quality of each event in a competitor's presentation. That is, there are no objective measurements which may be relied on to define minute variation, such as split-second differences in a hundred-yard dash, or fractions of inches of a pole-vaulter's leap. The evaluator must perceive and appraise a great amount of information in a few seconds time and in the subsequent moments before the next pyrotechnic event.

For the purposes of this treatise, the evaluator or judge is defined as a member of the judging panel. The competitor is the person doing the presentation. An event is a single unit in the presentation, such as a shell, rocket, or mine. A presentation is a group of similar events or items by one competitor in a competition category.

Each event is scored on a continuum of 0 to 10. Zero is for total dysfunction and 10 is considered to be almost unattainable perfection. An event acquires an initial score of 5 if it is properly described, functions correctly, has average difficulty of making, shows adequate color, achieves correct function height, has adequate timing of effect as described - if all the subsidiary effects function and the event is a good solid representation of its class or category - then it would earn at least a 5 or 6.

If the judge detects problems in the performance of the event, deductions are made according to the severity of the fault. Serious malfunctions such as flower-potting, unintended detonations, or effects activating on the ground earn a competitor a zero for the entry. Usually, any fault that might result in injury or property damage would result in zero. Less serious deficiencies, such as minor incidental fallout, effect not as described, timing errors, or pattern deficiencies would deduct from the score in proportion to noticeability and effect on the aesthetic qualities of the event.

Very often, there are enhancements that earn quality points, either balancing out deficiencies or adding to the base score, leaving the judge wishing that the competitor had tuned-in their technique more diligently. Such an entry event might earn an average score despite its better side.

A difference of opinion exist in the competitive realm between the science and art of pyrotechnics that puts science and craftsmanship at odds with art. This, however, is illusory and misleading. Earth, sky, and fire are the elements of the medium, and science and technique the vehicle that bring these elements together in unity and wholeness that enlighten the mind and brighten the spirit. This is the "ooh!" and "ah!" response that we look for, and the emotional quality the philosophers call the aesthetic response. The question becomes then, "What is more important?" Is it the aesthetic response, the artistic, or the advancement of craftsmanship and science? The answer is, of course, they are both important.

Strategies For Winning: The Description

By noon of the day of each competition, the competitors must have submitted to the registration table a description of the events, that is, the devices they intend to present. This may be done on the day of the competition or any day before at the convention. Submissions can be sent by email, postal mail, or submitted through forms at the web site at <http://www.pgi.org/competition.aspx>.

As soon as possible after being received, the descriptions are typed into the computer. After the deadline, noon (12:00 PM convention local time) of the day of competition, they are printed and the computer firing disc is burned. Late entries are subject to a penalty of score reduction or rejection of entry. At the competitors meeting, the descriptions are checked for accuracy. At the Judges meeting the descriptions are reviewed and discussed.

If the device and its parts have specific names, in the Terminology section or in other fireworks glossaries, the competitor is expected to describe his entries in these terms of accepted and familiar nomenclature. If there is some special quality in the entry, the competitor should mention what the Judges should look for.

A Chrysanthemum does not look like a Peony, pistils are not petals, timed reports do not fusillade. Creative, abstruse, or hard-to-understand descriptions are problems. "Purple dragons violating the heavenly blue meadow" does not tell the judges much about the event unless they can actually see something that looks like purple dragons.

If competitors are not sure of their terminology, they should ask knowledgeable persons to help with their descriptions. Minor nomenclature errors would not lower a score since the aesthetic and technique values dominate. Substantively incorrect descriptions may lower the score, such as calling random fusillading reports timed reports.

Strategies of Winning: Consequences of Failure

The competition is not the place to try out one's first efforts at building a particular device. Deficiencies may cost points, but failures are a disaster. As mentioned previously, an event will fail if there is no function upon initiation, it detonates unintentionally, it flowerpots, breaks low on the way up or down, swerves off course, effects function on ground, and any other malfunction that could be hazardous to persons or property - failure earns a zero. Because all events in a presentation are averaged, a zero can really drop the final score. A potential first place presentation can drop to third place or worse.

Strategies of Winning: Maximize Variety

The judges want to see a range of versatility demonstrated by the competitors. If the judges were required to give the same score to each successive reiteration of an excellent device, a competitor could win a category having presented only one device multiple times with minimal variation. Therefore variety is important and repetition of the same device with minimum variation will result in lowered score for repeated items.

Strategies of Winning: Timing

Timing is the most misunderstood variable that the competitor has to deal with. In the broadest sense, all fireworks use timing. A fireworks shell, for example, ignites and proceeds through a series of evolutions until the last effect dims in the sky. Fireworks is a temporal art, an event that occurs in a certain place occupying a particular interval of time. It shares a relationship with arts such as music, dance, and cinema. Music without a beat is disagreeable to the ear. A ballet artist may know all the moves, but without rhythm, positions are meaningless gestures. A movie may have a great story and accomplished actors, but the film editor and director develop the cadence and tempo in the cutting room that make it a work of art.

Timing, in fireworks, means to develop a rhythmic flow in a sequence of sound and light. Effect occurring on the beat, whether classic 3/4 time, jazzy 5/4, syncopated, or a creative rhythmic structure, where it is appropriate, will markedly enhance any pyrotechnic event. The pyrotechnic artist would do well to exactly determine the burning speed of the ignition materials and plot out the proper relationships by graphing out the effects and timing. The fireworker uses a caliper to measure the timing cuts for punching of the time fuse. Adjust spollettes by backdrilling the donor side to provide a specific length and burn time.

There are two ways that timing is used in an aerial shell, functionally and artistically (aesthetically). Functional timing simply means that the time fuse is adequate to get the shell to a sufficient height to break safely, and the subsidiary effects are timed to go off before they descend to a hazardous level in no carefully pre-planned order or spacing in time - all of this being done in an intuitive, seat of the pants, by gosh, rule-of-thumb manner. For the seasoned fireworker with plenty of experience this approach often works. They achieve the additional artistic effect that elicits our ooh and aah because of experience and practice. Perfect timing has become second nature. But for most of us, careful planning, craftsmanship, and practice are required to achieve, in reality, what we envision in our minds.

As far as the judges are concerned, timing means a recognizable rhythmic flow of events, as opposed to a fusillading random occurrence of events. In this, we are not referring to the timing needed for the shell to reach the functional height, but rather to what happens after the time fuse ignites the garniture. For instance, in a rondelle shell of 12 shots in a circle, it is much more effective to have the shots occur "around the clock" in timed sequence than to have them occur in random order. Such fine work would earn at least an added point in score. Conversely, if the competitor describes timed effects and the effects occur at random, the score may be graded down.

For example: A hammer shell requires a definite cadence. It is meant to simulate a smith forging iron on an anvil. The hammer goes: tap bam tap bam tap bam. The multi-break shell goes: color-report, color-report, color-report. Now syncopate the rhythm by adding a pause beat between the color-reports.

c-r//c-r//c-r/R (with the big bottom shot added)

Each letter and slash stands for one beat or time element. This timing scheme is only one of hundreds of possible relationships of the same elements of color sound and silence, each scheme eliciting its own emotional response. When a fireworker can weave into their art the emotional elements of anticipation, suspense and surprise, the art is truly mastered.

A description for this shell might be as follows:

"Hammer shell, three timed breaks, blue, red, white, with syncopated bottom shots."

If the description calls for (accurate) timing and the timing is not there, the score will suffer. Do not describe what you did not do. If you don't got rhythm you ain't got points. It does not need to be fancy - just accurate.

Strategies of Winning: What wins?

It is not the province of this chapter to recommend any pyrotechnic process or technique. For that, the aspiring pyrotechnist must seek the advice of knowledgeable persons. One way to do that is to push a personal envelope of capability by entering levels of expertise that challenge the ability. This will allow the pyro to meet, talk and work with more accomplished fireworkers.

Having made that statement, it begs qualification. The tyro should not march up to the accomplished pyros and beset them with demands, for example, "That really cool green with gold glitter you just shot; can I have the formula?"

That would be importuning. If you ask the right questions in the right way, you should get the right answers. Show that you have done some spadework - some research. A better way to ask, "I've been trying to get a good green with gold glitter like that one you just shot - here is my formula - would you evaluate it?" The experts invested a lot of time and effort developing their knowledge of the art. They are averse to bestowing this knowledge on opportunists. Most were coached by predecessors because they asked the right questions. I do not know what is a sure winner. If I did I would be out in the barn building it. I do know that when inspiration and artistic design are united with technical competency, surprises and high scores result. Moreover, often the winning competitor is delightfully surprised and the expectant competitor disappointed.

7. Terminology

Section One - Cylinder Shells

1. Cylinder Shell Types

A. Salute Shell

A shell that produces a single loud explosion as its significant effect. A material such as titanium may be added to produce a visual effect.

B. Single Break Color

One break of any one color or combination of color stars.

C. Color and Report

A single burst of stars followed by a heavy report.

D. Hammer Shell

A color break followed quickly by a report, another color break and report, this sequence traditionally repeated four times and often followed by a bottom shot, e.g., 9-Hammer. Accurate timing to a uniform cadence is essential.Additional delay on the bottom shot is traditional.

E. Draw Out Shell

A color break followed by four timed reports, followed by another color break, sometimes a ring of pupatelle and ending in a final report.

F. Shell of Shells

This shell contains smaller insert shells. These are usually thrown out into a wide circular pattern producing a ring of small bursts of color or other effects. A traditional-styled shell is characterized by a large burst radius, small splashes of color from the insert shells, all breaking at precisely the same time. There may be several breaks of inserts.

G. Sun and Planets

A variation of the Shell of Shells.The first break is a dark opening circle of insert shells, the second break a center of color representing the sun. A refinement is to have the sun color break appear before the planets, the outer ring of insert shells, and then have all of the stars burn out at the same time.

H. Saturn

A variation of Sun and Planets. The shell presents a symmetrical center color break and a symmetrical ring of comets with simultaneous burn out or split of the comets.

I. Spider Web Shell

A shell with an especially hard break that is usually filled with comets producing a golden streamer effect, but also occasionally appearing today in glitter effects.

J. Palm Tree Shell

Similar to a Spider Web Shell, usually silver/white with a rising effect, simulating the trunk of the palm tree with large comets of dense glitter simulating the palm fronds.

K. Sfera Shell

Same description as a Spiderweb Shell, however this shell contains very large comets.

2. Shell Components

A. Un-timed Audible Effects

Effects in which closely regulated timing is not essential.

1) Report

A device intended to make noise that is always a component of a larger device and as a bottom shot, the last component to present.

2) Shot

A small explosive charge intended to make noise. Also may be used to activate a secondary effect such as a crossette star.

3) Cannonade

A group of reports that travel for a few moments after the shell breaks and then perform more or less together, usually with significant impact. The shots are fewer and larger than Fusillading Shots. Can be preceded by a color break.

4) Fusillading Shots or Reports

A group of reports that travel for a few moments after the shell breaks and then perform in a random fashion over a short period of time. The reports are more numerous and smaller than a cannonade.

5) Saettine

Report originally made with dark report composition, thus producing a report with low light output. It has come to refer more to a method of construction using black match and sawdust to create a delay, but also appears with conventional time fusing.

6) Break of Saettine

A ring of reports thrown out forcefully and uniformly thus forming a ring in the sky. Ideally the shots all present at the same time.

B. Timed Audible Effects

Effects in which closely regulated timing is essential to æsthetic qualities of the presentation. Precise timing is a very creditworthy element in the competition.

1) Rondelle

A ring of reports thrown out forcefully and uniformly. The shots are timed to perform consecutively with precise timing, thus tracing the outline of a ring in the sky.

2) Timed Reports

A series of reports with periodic or carefully and precisely cadenced timing intervals between. A further refinement is a slightly longer interval between the last report and the heavy report.

C. Other Audible Effects

1) Whistle

A small tube filled with a fierceburning composition causing a whistling sound as it burns.

2) Crackle

An effect produced by small explosive granules in the matrix of the star or comet.

D. Color Inserts

1) Pupatelle / Pupadelle, Bombette

Small insert shells that are meant to produce a splash of color. Pupadelles are quite small.

2) Color Inserts

Larger inserts are simply referred to as color inserts.

E. Motion Effects

1) Serpent, Fish

A small tube device with an opening at one end, producing a visual effect (tail) tracing an often erratic swimming course in its display.

2) Tourbillion

Tube of composition with a hole or holes causing a spiral-like effect as the tube is propelled through the air.

F. Stars

1) Comet

A large cylindrical pumped star that typically leaves a spark trail.

2) Crossette

Also known as a Splitting Comet. A large pumped star that bums for a period of time then explodes from an internal shot. Smaller burning fragments fly outward from the star's trajectory. Traditionally, all stars in one timing break simultaneously. A further refinement is to have the fragments display symmetrically.

3) Glitter, Flitter, Tremalon

Star compositions producing sparks that are ejected from the burning star and then proceed to split into finer sparks. In some venues flitter denotes a bright spark trail effect that does not split into sparks. On the whole, it is difficult to differentiate the meanings, although flitter, and more prevalently glitter, is used in the U.S., glitter is preferred in the U.K., and tremalon in Italy. The tail (trail) of the star is composed of glowing semi-reacted dross which reacts to completeness with the oxygen the air, emitting bright sparks or flashes.

4) Streamer

A star with a particularly dense star trail of glowing sparks with minimal after reaction. If the effect is produced by black powder components, the usual reference is charcoal tail.

G. Modern Effects

1) Go-Getters

Self-propelled stars.

2) Strobe

Very bright stars which flash on and off with off with distinct on and off phases and very discernable colors.

3) Firefly, Transformation

A long delayed dross effect. A gold or silver flashing effect occurring in the tail of a star, dimmer and less defined than a strobe or a flitter, which floats and continues for a very long period of time. The effect should appear to hang in the sky.

H. Timing

Timing is an essential element in ærial fireworks. Timing refers to activation, that is ignition – a main time fuse ignites a break charge which deploys garniture, reports, or more components. It is used in two ways: to deploy the components in space so that they are in the correct position to function properly, and to arrange, in the time continuum, how and when the components will function in relationship to each other. There are three basic modes: random, simultaneous, and rhythmical.

1) Random Timing

In this mode the garniture is deployed by the break charge. Activation of the components is adequate for function but is not closely regulated. Fusillading reports are a prime example. The reports occur in a short time/space but not in concert with each other. Imagine a squad of soldiers firing at will, the result is a ragged or random volley.

2) Simultaneous Timing

All of the selected components fire at the same moment giving the effect of a single explosion, simultaneous activation, or appearance.

3) Rhythmical Timing

In this format the components are expected to work, in concert, in a space/time relationship. In essence, each component is given a specific sky position and a specific time to function which is related both in space and time to all the other components. A Hammer Shell is an excellent example:

Color-report-pause |
/ / / /
Color-report-pause |
/ / / /
Color-report-pause |
/ / / /
pause-Bottom shot |
/ /

Each slash represents a beat. Timing would be in 4/4, march time, four beats to a measure. In this instance, a definite identifiable rhythmical cadence is followed. Note that the last measure has only two beats. This is acceptable.

The space relationship is established by having the first color breaks occur at the apogee and the following breaks cascade down one after the other. The bottom shot occurs at the lowest level. If it serves the æsthetic purpose, as in a Rainbow Shell, the breaks may begin on the way up.

Another example of rhythmical timing is the rondelle shell or break wherein reports are thrown out in a circular formation and detonate "round the clock." Here the spatial element is the ring, and the progression round the circle of the reports. These and other simultaneous and rhythmical timing schemata are creditable. A description, however, that calls out, for instance, "timed reports" that actually fusillade, is not creditable.

Section Two – Ball Shells

1. Hard Break Oriental Shells (Warimono)

These shells have heavy burst charges and strong shell walls which cause the garniture to be propelled a considerable distance. The burnout of stars may occur while the stars retain sufficient inertia to be traveling fairly straight, in which case the star pattern is globe-shaped, or having slowed and responded to the force of gravity, are dropping and assuming a crown shape.

A. Elements

1) Petals

A spherical formation of stars which display concentrically creating the exterior shape of a Chrysanthemum or Peony. A single course of stars is a single petal, two courses are two petals, with each succeeding course displaying within the interior of the previous course.

2) Pistils

A display of stars that provides a central focal point, the color of which is contrasting or complementary to the outer stars. A pistil might not be as symmetrical as petals but the stars are clustered and propelled outward from the center and usually burn out before dropping.

3) Tail

An effect produced by semi-reacted dross which falls behind, or is propelled from the star, and reacts to complete combustion in a delayed manner producing flashes within the glowing drossy tail. Effect may be termed flitter (U.S.), glitter (U.S., U.K.), or tremalon (Ital.)

B. Shell Types

1) Chrysanthemum

A spherical break pattern in which tailed stars are thrown out from the center, straight and hard, creating a burst of spokes and/or an expanding globe of color. The stars are fast burning and are calculated to burn out before dropping.

2) Crown Chrysanthemum

A type of Chrysanthemum in which the effect is to open with the burst radius of a Chrysanthemum, but instead of going out, the stars continue burning, producing drooping star trails in a pattern like a parasol or king's crown.

3) Kamuro

As above, a crown chrysanthemum with spark effect subdued and strand-like, rather than glittery, bushy, or branching, in long tendrils, reaching almost to the ground similar in shape to an old fashioned "bowl haircut."

4) Diadem

A specific type of Chrysanthemum which incorporates color-changing stars or bright metal effects. The stars may burn long enough to arch over to produce the crown shape. A Ruby Diadem should display a hard breaking tailed star and then display a simultaneous color change to red. If the stars arch over, this is the same as a Red tipped crowned Chrysanthemum. A Diamond Diadem would produce stars with simultaneous terminating silver flashes. Other colors may be identified by the color name or by the represented gem color.

5) Peony

A spherical break pattern wherein stars without pronounced fire trails are thrown out from the center, straight and hard, creating an expanding globe of color. The stars often flash brightest at the outer edge of the expanded pattern creating an instantaneous large globe effect.

6) Dahlia

A Peony type shell made with very bright stars.

7) Ring and Pattern Shells

Single and multiple rings, alphabet letters, and shapes such as hearts, spirals, smiley faces, and other simple shapes.

8) Bow Tie

On break, two groups of stars are propelled in opposite directions as if squirted from hose nozzles. The presentation may include a ring of stars, propelled circumferentially at 90 degrees from the spray axis.

9) Palm Tree

A specific type of shell designed to represent a palm tree including trunk and fronds.Thus a large rising tail and a break of bushy dripping fierce burning stars.

10) Tiger Tail

An effect of a spiral rising tail usually charcoal such that it appears orange and black like a real tiger's tail. Specific charcoal star formulas designed to create this effect have been dubbed "Tiger Tail" and are often used to produce a charcoal burst of stars thus a "Tiger Tail Shell," a source of confusion especially if there is no rising tail.

2. Soft Break Oriental Shells (Poka)

A soft breaking oriental style shell used to deploy stars, and insert effects such as parachutes, tourbillions, reports, serpents, fish, whistles, lanterns, flags, figures and other types of insert effects.

A. Willow

A soft break of stars, usually with pronounced fire trails, of burning duration sufficient to create a drooping or weeping effect. The star trails are full and bushy. The initial effect may or may not be symmetrical.

B. Report

Single or multiple explosions usually in odd numbers timed in regular intervals or random. If in regular intervals or in structured rhythmic pattern, i.e., cadence, the reference is timed report. If the effect is random, it is referred to as fusillade or cannonade. Fusillade alludes to musketry and many small reports while cannonade implies fewer and heavier explosions. This is a very specific difference between timed and random reports, and random should not be described as timed.

C. Falling Leaves

Slowly falling and independently undulating star like fire formations.

D. Parachutes

Day parachutes include banners, flags, streamers, signs and figures suspended from parachutes, also self-inflating comic figures, plain or with internal flares for illumination at night. Other night items are parachute flares for ground illumination or color, waterfalls, strings of bengals and lances.

E. Crackle

Stars burn with pronounced small explosions. May be used as the core of round stars.

F. Various other effects

Split Comet or Crossette, Mini Roman Candle, Tourbillion, Serpent or Fish, Whistles, Hummers. The above are more prevalent in European canister type, aerial fireworks, qq.v., but through the process of cross fertilization have found limited use in Oriental specialty shells.

Section Three - Other

Standard Rocket

A rocket fireworks device consisting of one or more motors on the same stick, where no more than one motor (or stage) is lit at the same time.

Caduceus Rocket

A rocket fireworks device consisting of two rocket motors on the same stick, typically with a short crossbar, positioned to provide both rotation and lift, so as to provide a Caduceus effect consisting of two inter-twined or twisted tails.

Girandola

An aerial fireworks wheel intended to be fired in an horizontal position, with drivers so positioned to provide both rotation and lift, so that the wheel rises from its firing position into the air. It may fall and rise and fall with several succeeding groups of drivers, and it may conclude with a discharge of stars and garnitures and reports. A girandola is a provocative study in timing.

8. Summary Table

Competition
Code for the competition

Description
Competition name

Required
Required entry for this competition

Pro?
Are professionals allowed in this competition?

Team?
Are team entries allowed?

Win Twice?
May a (non-default) winner of this competition compete in the future?

GMPC
Grand Master Point Code

Max Single
Maximum size of devices in this competition. Maximum size for of single break shells or maximum motor i.d. for standard rockets

Max Multi
Maximum size for multi break shells or maximum motor i.d. for Caduceus rockets. Size may be followed in parentheses with maximum number of breaks at that size.

Min Head
Minimum number of distinct heading effects required.

Min Tail
Minimum number of distinct tail effects required.

Competition	Description	Required	Pro?	Team?	Win twice?	GMPC	Max Single Break	Max Multi Break	Min Head Effect	Min Tail Effect
1-1	Aerial Level 1	4 shells	N	N	N	E	3"			
1-2	Aerial Level 2	4 shells	N	N	N	D	4"	3"(2)	3	
1-3	Aerial Level 3	4 shells	N	N	N	C	6"	Note 1	3	
1-4	Aerial Level 4	4 shells	Y	N	Y	B	8"	Note 2	3	
1-5	Aerial Level 5	4 shells	Y	N	Y	A	10"	Note 3	3	
1-6	Aerial Level 6	4 shells	Y	N	Y	A			3	
1-AB	Best Beginner Shell	1 pair	N	N	N	E	3"			
1-AA	Best Miniature Shell	1 pair	Y	N	Y	C	2"	2"		
1-A	Best Small Shell	1 pair	Y	N	Y	C	4"	3"		
1-B-B	Best Medium Ball Shell	1 pair	Y	N	Y	C	5"	4"		
1-B-C	Best Medium Cylinder Shell	1 pair	Y	N	Y	C	5"	4"		
1-C-B	Best Medium Large Ball Shell	1 pair	Y	N	Y	C	6"	5"		
1-C-C	Best Medium Large Cylinder Shell	1 pair	Y	N	Y	C	6"	5"		
1-D-B	Best Large Ball Shell	1-3 entries	Y	N	Y	C	8"	6"		
1-D-C	Best Large Cylinder Shell	1-3 entries	Y	N	Y	C	8"	6"		
1-E-B	Best Exhibition Ball Shell	1-3 entries	Y	N	Y	C				
1-E-C	Best Exhibition Cylinder Shell	1-3 entries	Y	N	Y	C				
2-1	Rocket Level 1	4 rockets	N	N	N	E	⅝"	½"	2	1
2-2	Rocket Level 2	4 rockets	N	N	N	D	¾"	⅝"	3	2
2-3	Rocket Level 3	6 rockets	Y	N	Y	B	1¼"	1"	3	2
2-4	Rocket Level 4	6 rockets	Y	N	Y	A			3	2
2-A-S	Best Small Rocket	1 pair	Y	N	Y	C	¾"			
2-A-M	Best Medium Rocket	1 pair	Y	N	Y	C	1¼"			
2-A-L	Best Large Rocket	1 pair	Y	N	Y	C				
2-C-S	Best Small Rocket Motor	1 pair	Y	N	Y	D	¾"	⅝"		
2-C-M	Best Medium Rocket Motor	1 pair	Y	N	Y	D	1¼"	1"		
2-C-L	Best Large Rocket Motor	1 pair	Y	N	Y	D				
2-D-S	Best Small Girandola	1 entry	Y	N	Y	C				
2-D-L	Best Large Girandola	1 entry	Y	N	Y	C				
2-D-U	Best Unlimited Girandola	1 entry	Y	N	Y	C				
3-1	Ground Display Level 1	Note 4	N	Y	N	C				
3-2	Ground Display Level 2	Note 5	N	Y	N	B				

Note 1: 5"(2), 4"(3), 3"(4)
Note 2: 7"(2), 6"(3), 5"(4)
Note 3: 8"(2), 7"(4)
Note 4: Minimum of 5 effects, 10 devices
Note 5: Minimum of 6 effects, 15 devices
Note 6: Minimum of 7 effects, 30 devices

Competition	Description	Required	Pro?	Team?	Win twice?	GMPC	Max Single Break	Max Multi Break	Min Head Effect	Min Tail Effect
3-3	Ground Display Level 3	Note 6	Y	Y	Y	A				
3-A-S	Best Small Gerb	1 pair	Y	N	Y	D	1½"			
3-A-L	Best Large Gerb	1 pair	Y	N	Y	D	3"			
3-B-S	Best Small Comet	1 pair	Y	N	Y	D	2"			
3-B-L	Best Large Comet	1 pair	Y	N	Y	D	3"			
3-B-U	Best Unlimited Comet	1 pair	Y	N	Y	D				
3-C	Best Wheel	1 wheel	Y	N	Y	C	1¼"			
3-E	Best Roman Candle	1 pair	Y	N	Y	D	2"			
3-F	Best Lance Piece	1 entry	Y	Y	Y	D				
3-G	Best Movie Special Effect	1 entry	Y	Y	Y	C				
3-H-S	Best Small Mine	1 pair	Y	N	Y	E	4"			
3-H-L	Best Large Mine	1 pair	Y	N	Y	C	6"			
4-A	Best Small Class C Display	1 display	Y	Y	Y	E				
4-B	Best Large Class C Display	1 display	Y	Y	Y	D				
4-C	Best Unlimited Class C Display	1 display	Y	Y	Y	C				

(Dr. Arthur R. Tilford, Chief Judge PGI)

10.00 (Perfect)

9.60 to 9.99 (Near Perfection)

9.00 to 9.59 (Spectacular and above Distinction)

8.60 to 8.99 (With Distinction)

8.00 to 8.59 (Beyond Outstanding)

7.60 to 7.99 (Outstanding)

7.00 to 7.59 (Excellent)

6.60 to 6.99 (Near Excellence)

6.00 to 6.59 (Very, very Good)

5.60 to 5.99 (Good: Above the Expected)

5.00 to 5.59 (Expected as stated)

4.60 to 4.99 (Expected with reservation)

4.00 to 4.59 (Less than Expected)

3.60 to 3.99 (Far Less than Expected)

3.00 to 3.59 (Poor)

2.60 to 2.99 (Very Poor)

2.00 to 2.59 (Unfortunate failure)

1.01 to 1.99 (Abysmal failure)

0.01 to 1.00 (Dangerous and not pyrotechnics)

0.00 Disqualified