TITLE

Pyromusicals 101 - 11 Seasons Reporting on the Montreal International Fireworks Competition

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ABSTRACT

The witnessing of 101 pyromusicals at the largest pyromusical competition in the world has given the author an almost unique insight into the development of the pyromusical art over the past ten year. The evolution of the author's involvement in reporting on the Montreal competition, from simple USENET posts to the current website, as well as details on the methods used to compile the reports is presented. Finally, observations on the development of the pyromusical art over the past decade and some thoughts on what it takes to present an award winning display.

INTRODUCTION

For the past ten years, I have been enthusiastically reporting on the Montreal International Pyromusical Competition and have, in the eleven seasons I've been involved, witnessed one hundred and one pyromusicals. This paper presents the history of my involvement in reporting on the competition; the evolution of my reports from simple usenet posts to one of the most popular fireworks websites as well as the methods I use to compile them; finally, my observations on the development of the pyromusical art over the past decade and some thoughts on what it takes to present an award winning display.

DISCUSSION

Evolution of The Pyrotechnic Reporter

I've had a lifelong interest in pyrotechnics – some of my earliest memories are from Guy Fawkes night in England as a very young child – and so moving to Montreal in 1993 was an exciting prospect due to the renowned Benson and Hedges Fireworks Competition, as it was then called. At the time, I was in an academic setting at McGill University and thus had access to the discussion forum part of the internet, called usenet. I was surprised that there seemed to be little coverage of the competition and so took it upon myself to inform a wider public about it.

This lead me to the idea to write reports on the displays since I believed this would stimulate discussion and encourage other critics to post their opinions. Thanks to the wonderful capabilities of the google search engine [1], I was able to retrieve my original usenet post, made on June 15th 1993 in the rec.pyrotechnics newsgroup, see figure 1 in the appendix. Around this time, many posters to the rec.pyrotechnics newsgroup were becoming disillusioned with the number of "kewl bombz" type of posts and thus the Pyrotechnics Mailing List (PML) was founded by Mark Buda as a haven for people seriously interested in pyrotechnics. For the next couple of years my reports were posted to the PML, rather than to usenet. Parallel to this the world wide web was starting to take shape – I was one of Netscape's beta testers in early 1994 of Netscape Navigator version 0.86 – and so Mark converted my early reports into HTML and they were put up on an pyrotechnics website. At the same time, the New Hampshire Pyrotechnics Association (NHPA), of which Mark is a member, asked me if they could use my reports for their newsletter, to which, of course, I agreed.

The start of the website

In 1996, I was working at the Ecole Polytechnique in Montreal and sometime around July of that year, a web server was installed on my group's network. By default, every user of that network had a website, though most people didn't take advantage of this. I thought it would be interesting to learn HTML especially since my group planned to use the web as an internal documentation system. At that time, many people's personal websites consisted of such things as links to other sites, pictures of the user's pet, spouse, offspring etc. It was immediately obvious that I could use my Montreal Competition reports as something interesting to put up on this proto-site. Mark kindly returned the original PML reports, which he'd converted into HTML, so these formed the basis of my site. I'm sure many people remember the unwieldy URL that I had to use: `http://www.grm94.polymtl.ca/~marriott/pyro.html` – not exactly user friendly!

Also at this time, I decided to take the report writing more seriously and watch each display from La Ronde itself, rather than the banks of the St Laurence river as had been the case from 1993-1995. This is where the connection to PML and the NHPA became very useful. PPA were presenting the second competition display that year and I got a call from Dave Demsey, asking me to meet him in the press room afterwards, since he'd be there to video the display. I said that I'd love to, but didn't have a press pass. Dave pointed out that my writing for the NHPA was, in fact, a genuine journalistic activity and he gave me the PR contact at La Ronde so that I could get my accreditation. A couple of phone calls, plus a fax from Dave Pierson, the editor of the NHPA newsletter was all that was required to get my press credentials in place. From this point onwards there was to be no turning back. The report writing became a serious endeavour and I haven't missed a single display in all the years from 1996 until the present day. Figure 2 shows the website as it was at the end of the 1996 season.

Evolution of a site

The Ecole Polytechnique web server continued to provide a home for my site for the next several years. By 1998, various photographs had been added, but the format of the site was still essentially the same. Figure 3 shows the website as it was at the end of 1998. Since I had left the employ of the Polytechnique, it became long overdue for the site to move to a permanent home with an easy to remember domain name.

In 2001 montreal-fireworks.com was founded. The initial layout of the site was designed to be more user-friendly and attractive than the old site, but still suffered from having each page contain both the content and mark-up for formatting, making it difficult to maintain the site and have a uniform look to all the pages.

As more and more reports and pages were added to the site, it became apparent that a more structured approach to the website design was required. A full year's report had become a rather large document and maintenance was becoming a chore.

A decision was made to learn about standards-compliant web design techniques, both to simplify maintenance of the site and improve the look-and-feel as well as streamline operation. Thus the whole site was redesigned using validated HTML4.01 with Cascading Style Sheets (CSS) for all of the formatting. The move to using CSS meant that it became trivial to have a consistent appearance for all pages in the site and make it very painless to update the look if required, as was done in 2003. All reports and photographs were moved into script-based page generation, again simplifying site maintenance and generally streamlining the whole site. Now maintenance is a lot easier and it takes much less time to add new pages or update the look of the whole site. Both the HTML mark-up and the CSS used have been validated [2,3] by the W3C. This means that the site should be accessible in any standards-compliant browser and it has been designed to be accessible in older non-compliant browsers and even simple text-only browsers. Figure 4 shows the site in its present form.

As the site has evolved, so has its popularity. It is now one of the most popular fireworks sites on the web, at least in terms of number of page hits. At the height of the competition this year, an average of 2221 pages impressions per day were being serviced. This compares with about 100 pages per week in 1996! The site is the top link on a google search for “montreal fireworks”.

Compiling Reports

Many people ask how I write the competition reports. Over the years, I've developed a technique, which, by no means perfect, seems to work well. The equipment used is really quite simple:

- Propelling pencil
- Small notebook
- A practised eye
- Patience

The propelling pencil is important because it allows me to write when it is raining – ink would potentially run and become unreadable. The notebook has evolved as the most reliable way for me to record what I see, though heavy rain does cause some challenges.

I'm often asked if I use any electronic equipment to aid my task, such as a dictation machine, video camera etc. The answer is a resounding **no**! If I was to use a video camera, I would end up missing the enjoyment of watching a display, even though it may – possibly – lead to a more accurate report. Part of the reporting is a sense of the feeling the display generates; a video recording would not allow me to write **WOW** during an exciting moment! As for using a dictation machine, this also suffers from the inability to record pictorial information which is easy to draw in pencil. It would, in theory, be easier to decipher than my rather poor handwriting, but that assumes that any speech recorded would be audible, let alone understandable. In 2002, I did contemplate using a digital recording device since heavy rain was forecast for the opening display. I experimented in a noisy electronics store and found that the few seconds of speech I recorded were completely impossible to understand when played back. At least with written notes there is the possibility to trace over the hard to read words (and there are many of these) to decipher their meaning.

The practised eye is perhaps the most important factor in writing the reports. Because I have witnessed so many world-class displays now, I can very quickly recognize pretty much all the different types of shells and effects, though the many subtle types of glitter/flitter comets sometimes defy accurate categorization in the reports.

Finally, patience is required to turn the raw notes (on average around 32 small notebook-sized pages) into a coherent written report. This takes an around three hours per display. Since I switched to a style-sheet based website design, the amount of time to correctly format the reports has been reduced as I now use a script which automatically assembles the report from various components, the main body of the report having very little mark-up required. This has allowed me to focus on content rather than style.

Report Audience

The reports are aimed squarely at an informed pyrotechnician audience and are designed so that, with a good imagination and knowledge of the physical layout of the site, a fairly accurate mental picture of each display can be conjured up in the reader's mind. There are very few resources available for the budding pyromusical designer and the list of music used alone is a valuable resource. I try, as far as is humanly possible, to present a neutral description of each display, though, as fireworks are designed to excite the emotions, I do note the parts that I found exciting. Musical taste is a very personal thing and so I try not to comment too much on the choice of music

since what may be awful to my ears could well be fantastic to someone else's. Incidentally, this is the same approach used by the official competition jury – whether they like the music or not is secondary to the judgement of how well the fireworks went with the music chosen. My aim is to be the eyes and ears of those members of the pyrotechnic community who are unable to attend the competition.

The Art of the Pyromusical

Having now witnessed 101 pyromusicals in Montreal, I think I am somewhat qualified to comment on the evolution of the pyromusical art over the past decade and give some opinions as to what constitutes a successful pyromusical display.

What is a pyromusical?

Sometimes it is easier to answer the inverse question: what isn't a pyromusical? A pyromusical is certainly not just "fireworks with music". There are many fireworks displays presented these days in which there is background music used. Some of these are probably pyromusicals, most are probably not. An analogy that could work is the difference between a ballet and a disco: a ballet is dance that has been choreographed to music and tells a story, inciting a range of emotions in the audience. A disco is a bunch of people dancing to music. There is no story and no real intent to take the audience through an emotional journey.

Technological evolution

Technology has played an important role in the development of the pyromusical. The least precise method for firing fireworks is manual ignition with a hand igniter. With skilled pyrotechnicians, a certain rhythm in the display can be developed, but it is nigh on impossible to do any serious choreography.

The move to electrical firing allowed two important features: the firing of multiple devices physically separated from each other and an increase in operator safety. Once the physical placement of the fireworks can be arbitrary, much more interesting set design techniques can be employed to use the space available and thus design the fireworks into that three-dimensional space. Now the designer has much more freedom and has a much enlarged canvas to work upon. Manual electrical firing using some kind of push button system starts to allow enough control over the timing of the firing to allow the fireworks to be synchronized to the music. Once synchronization is possible, true choreography can be achieved, especially with the freedom in set design the electrical firing enables.

However, manual firing is still limited in precision and the number of cues that can be fired in any given time is constrained by having a firing system without an unwieldy number of buttons to press. These two constraints – the rate of firing and the number of separate firings make it relatively difficult to produce a successful pyromusical. However, in the hands of skilled artisans, it is possible, the proof of this being several Gold Jupiter winners in Montreal who have used manual firing. As we shall see later, a successful pyromusical is more than just about precision of firing.

In the past decade, there has been a move towards using digital firing systems where the number

and time precision of cues is, to all intents and purposes, unlimited. These systems allow cues to be fired at a rate such that each individual beat of the music can have an effect fired to it, or, in fact, at an even greater rate. The number of cues is really only limited by the number of firing modules required, and is thus more of a cost constraint than a physical system limitation.

Now a pyromusical designer has both a free canvas to work with, constrained only by such things as safety rules, as well as systems which allow very precise and fine-grained control of the actual firings. With this freedom, true pyromusicals are possible, where the fireworks and the music are truly choreographed together in both time and space.

Pyromusical ingredients

A lay person can become a connoisseur of fine food by visiting many restaurants over the years. In the same way, after witnessing 101 pyromusicals in Montreal, I believe I have evolved a sense of what ingredients it takes to make a successful pyromusical. But, as earlier, sometimes it is easier to state the inverse case and list those things which do not work well in a pyromusical context. The most obvious one to my mind is that a set of tableaux, each a piece of unrelated music, forming a kind of slide-show, do not make a successful pyromusical. No matter how well each scene is choreographed, such a display is inherently disjointed and does not tell any kind of story. Without this, it is much harder to lead the audience on an emotional journey.

I believe the ingredients of a successful pyromusical can be summarized thus:

- Theme
- Flow
- Emotion
- Coherence

Theme is important since it provides the framework which holds the whole performance together and allows a story to be told. With a good theme, there is a natural flow from scene to scene. As in a good symphony, there are always appropriate moments for the audience to catch their breath as the story unfolds. This allows a range of emotions to be expressed, from calm serene moments, to other times when a much more heightened state of excitement is produced. The contrasts between these states adds highlight to the experience and makes it more exciting. Finally, coherence is required to avoid the feeling of a slide show. This coherence can include such things as choice of colours, the effects used and the overall appreciation for the set design offered by the firing site used. Many potentially good displays are spoiled due to a slap-dash approach which gives the feeling that one is witnessing a warehouse clearance, rather than a carefully crafted performance where each of the elements are carefully chosen. This is also true for displays which pay no attention to the firing site used, such as ignoring water features etc.

Technology only becomes a tool which allows a means to implement the above ingredients. There is always the temptation to use technology for its own sake. Unfortunately then certain clever effects become clichéd and unrelated to the proper choreography. Such things as chase sequences spring to mind as an example of this tendency.

Notice that, so far, I have not specifically mentioned choice of music. This is such a broad and subjective issue that it is really not appropriate to go into without some caution. What I can say is

that certain pieces of music have become very clichéd and have thus lost their impact. One can almost check off a list of pieces that, it seems, *have to be present*, in a pyromusical display. These type of displays tend, in my opinion, towards the "fireworks with music" type, rather than true pyromusicals.

Evolution of the pyromusical

During my eleven seasons reporting on the Montreal Competition, I have witnessed an evolution in the quality and artistry of the pyromusical. Technology has played a rôle in this evolution, particularly in the number of cues used in a display. In the mid 1990s, a Gold Jupiter winning display, if it was digitally fired, used somewhere around 2000 cues [4]. In 2003, many of the digitally fired displays used somewhere around 4000 cues (no written reference, just from talking to the pyrotechnic designers). Thus there has been a doubling in the complexity. Earlier, when manual electrical firing was the rule, as few as 120 cues were sufficient to win the competition. However, technology alone is not enough. The ingredients must still be present. If anything, technology levels the playing field since everyone can potentially have the same precise control allowing perfect synchronization, the main differentiator being the overall pyromusical design.

Looking at the list of winners in Montreal [5], every winner of the Gold, Silver and Bronze Jupiters has used electronic firing since 1999, except for 1999's Bronze prize. This mirrors the evolution of the pyromusical from "music with fireworks" to a true, highly choreographed art form.

Future developments

Firing precision can now be even better thanks to the use of MagicFire [6] type electronic igniters. These remove all the variance pyrotechnic time fuse causes, allowing synchronization down to the millisecond level. Now pyrotechnicians can have absolutely exact control over their fireworks. However, such technology has to be used with care. When computer sequencing of music became available, the perfection in timing was at odds with the natural timing variations humans expect in music and much computer sequenced music sounded cold and soulless. The same problem is possible in pyromusicals if care is not taken to allow the human element to remain. A perfectly synchronized display can seem lifeless.

The final piece of technology that is required is software to help design displays. Whilst the digital firing systems do include scripting software which allows the cues to be placed at the appropriate points in the music, as well as account for the firing delays automatically, the missing element was a system to permit visualization of the display. This is now possible through such software as Visual Show Director [7], PyroCreator [8] and ShowSim [9]. These tools allow even the designer to try out ideas before committing them to be actually fired and are powerful demonstration aids when bidding on contracts for such events as the Olympics etc. Now all that is required is the imagination and vision to design in an art form which uses the sky as its canvas.

CONCLUSIONS

The art of the pyromusical has progressed tremendously in the past decade from "fireworks with music" to a true art form. Technology has helped this evolution and progression and will continue to do so in the future with software developments in the design and visualization arena and hardware developments with such devices as electronic timers. The Montreal International Pyromusical Competition has been at the forefront of these developments, allowing pyrotechnicians to raise the bar in the development of their art form. My duty as a reporter has been to witness and document this progression and hopefully aid the propagation of this art form.

ACKNOWLEDGEMENTS

I would like to thank Mark Buda, Dave Pierson and all the members of the New Hampshire Pyrotechnics Association for their encouragement over the years and for providing the initial forum for my reports. I would also like to thank the dedicated team of pyrotechnicians, competition organizers and public relations people at La Ronde, particularly Martyne Gagnon and Paul Csukassy, for their support and for giving me the access that has allowed me to produce high-quality reports since 1996. Finally, I would like to thank the many people who have taken the time to write to me over the years and especially those who have travelled to Montreal to witness the competition first hand on the basis of my reports.

REFERENCES

[1] The usenet post that started it all: http://groups.google.ca/groups?selm=1vlaan%24ed4%40Lightning.McRCIM.McGill.EDU&oe=UTF-8&output=gplain

[2] W3C HTML validator:
http://validator.w3.org

[3] W3C CSS validator:
http://jigsaw.w3.org/css-validator

[4] Final paragraph has the PyroDigital module count:
http://montreal-fireworks.com/cgi-bin/rep.cgi?head1996,usa96,tail1996

[5] Comprehensive list of laureates in the Montreal International Fireworks Competition:
http://montreal-fireworks.com/pyro_winners.html

[6] Electronic time fuse:
http://www.magicfire.com

[7] Visual Show Director design and visualization:
http://www.infinityvisions.com/vsdpro

[8] PyroCreator visualization software:
http://www.pyroinfinity.tv

[9] ShowSim visualization software:
http://passfire.com/showsim/help_intro.asp

APPENDIX

Figures

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From: marriott@McRCIM.McGill.EDU (Paul Marriott)
Newsgroups: rec.pyrotechnics
Subject: 9th International Fireworks Competition
Date: 15 Jun 1993 16:09:59 -0400
Organization: McGill Research Centre for Intelligent Machines
Lines: 43
Message-ID: <1vlaan$ed4@Lightning.McRCIM.McGill.EDU>
NNTP-Posting-Host: lightning.mcrcim.mcgill.edu
Summary: Huge free fireworks displays weekly in Montreal


Enthusiasts of pyrotechnic displays may like to check out the
9th International Benson and Hedges Fireworks Competition which
is being held ever weekend in Montreal until the 1st August.

The competition started on June 5th with a display from the American
team, represented by "Rozzi's Famous Fireworks". This was a spectacular
display with, according to the local press, over 3000 shells being fired
through the 30 minute music co-ordinated display. Some unusual effects
were created - one that springs to mind is the creation of "palm trees".
These apeared to be shells which, instead of ascending in darkness, left
a "trunk" of sparks and then exploded into "palm fronds" complete even
with glowing "red berries". Also interesting were the huge displays
of "twinkling stars" (the formulae for which have been discussed in this
group) with many thousands of the stars filling the sky at any one time.
All in all, this was a terrific opening to the competition, especially the
finale which was performed to the finale of Grofe's Grand Canyon suite.

Last Saturday saw the turn of the Canadian team, represented by
Ampleman of Montreal. This was a completely different approach to that
of the American team, with much more serene atmospheric effects which
fitted well with the accompanying music. There were some particularly
dramatic stars which changed colour several times and also the use
of violet and orange (something which I haven't seen before). However,
I rated this display lower than that of the American's since there
were almost no salutes.

Next Saturday's display promises to be interesting. It is being performed
by the British team, represented by Kimbolton Fireworks (director = Ron
Lancaster (of pyro book fame)) and marks the return of Britain to the
competition after and absence of 8 years.

Other entrants are Holland, Germany, Spain, China (last year's winner)
and France. The French display should be interesting since it is being
put on by one of the oldest pyrotechnics companies in the world - Ruggieri
(founded in 1739, I think).

Performances start at 10pm every Saturday, (Sundays in July and August)
at La Ronde, on Ile St Helene in Montreal. Entrance is Can$9-45, or
Can$20-45 for reserved seats (plus taxes). However, there are plenty
of places where the displays can be seen for free, and possibly to
better effect than being sat up close.

Paul.
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Figure 1 Original usenet posting

Figure 2 1996 website

Figure 3 1998 website

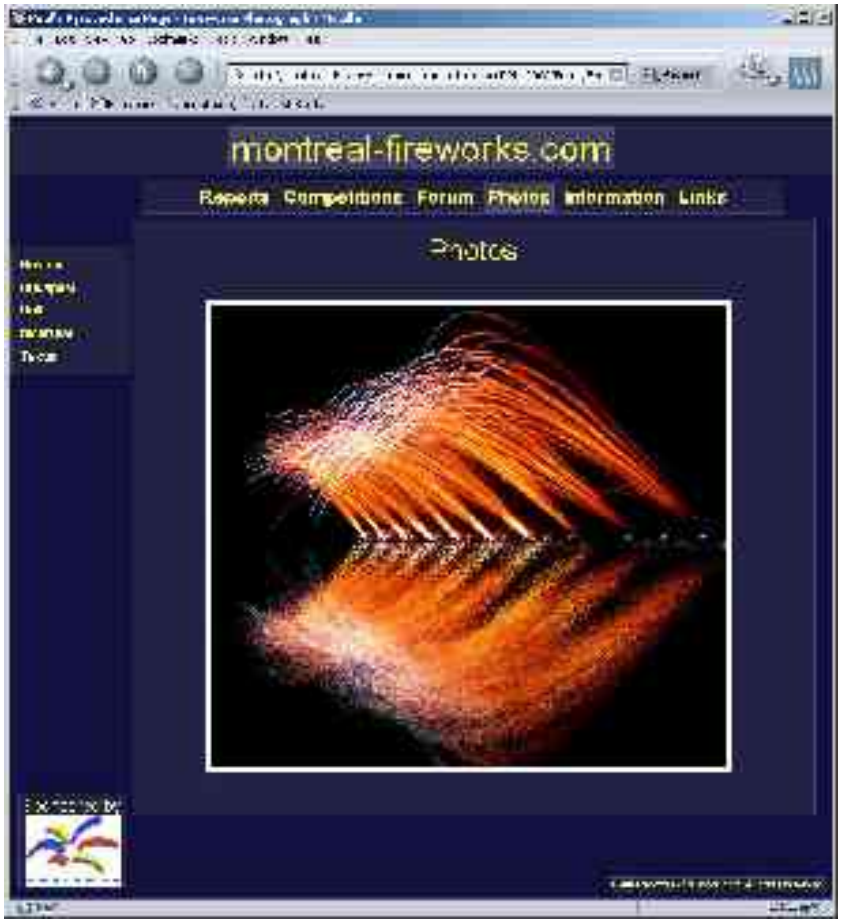

Figure 4 2003 website