

## CALIBRATED EAR TEST OPTIONS

### POSSIBLE REPLACEMENTS FOR THE CPSC'S CALIBRATED EAR TEST FOR AERIAL CONSUMER FIREWORKS

K. L. and B. J. Kosanke

#### Background:

The US Consumer Product Safety Commission (CPSC) evaluates aerial consumer firework products for their production of an "audible effect". The relevance of this evaluation is that it determines the amount of burst charge allowed. Those aerial devices found by the CPSC to produce an audible effect are limited to 130 mg of explosive composition (i.e., burst charge). To the contrary, those aerial devices found not to produce an audible effect may have as much as 10 g of burst charge (i.e., more than 60 times greater than 130 mg).

The CPSC's audible effect evaluation has been accomplished by a lab technician simply listening to the products as they function normally. (This test has been described by some as the 'ear test' or the 'calibrated ear test'.) Obviously this test is highly subjective, is not quantitative and is not scientifically reproducible. Not surprisingly, ear test results have occasionally been challenged by members of the firework industry. As a result, by some reports, the CPSC recently spent time having a technician attempt to develop a quantitative test to replace the ear test; however, apparently the project was unsuccessful for some reason and was terminated.

Probably the most intractable problems with an effort to find a replacement for the test are deciding exactly:

- What physical parameter(s) will be measured in the test?
- What are the physical conditions to be required for performing the test?
- What is the quantitative limiting value of the chosen parameter(s) separating those device explosions that are considered to produce audible effects from these explosions not considered to produce audible effects?

In addition to general product safety considerations, there may be historical, commercial and past regulatory aspects that probably also will need to be considered. Greatly complicating the situation is that the interested parties (the CPSC and the industry) have varying and conflicting interests in the subject.

#### Possible Approaches:

For aerial shells not dispersing stars and/or other components (e.g., whistles or parachute devices), the situation is fairly straight forward. Such devices can reasonably be considered as only producing audible effects; with any associated flash of light, radiating sparks (such as from titanium particles) and ascending effects (such as an attached comet) being considered mere incidental effects. For such aerial devices, the 130 mg limit could continue to strictly apply.

Of course, there continues to be a need to eliminate devices purposefully designed to circumvent the audible effect powder limit, such as by including a few small stars in what otherwise would be considered to be a salute. However, the current requirements in the APA and AFSL standards should be effective in this ➤

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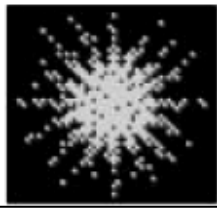
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regard. These requirements include the –100 mesh metal powder rule and the 25% rule on the ratio of burst charge to stars and/or other components contained within the shell.

It is for aerial shells dispersing stars and/or other components, for which the audible effect issue can pose a more intractable problem. This is because the effectiveness of the visual effect produced by such shells is at least in part a function of the power of the shell bursts (i.e., powerful shell bursts result in wider-spreading and generally more attractive visual displays). Thus, a manufacturer may want to increase the power of their shell bursts for their enhanced visual effect, with the accompanying enhanced audible effect primarily considered an unavoidable side effect.

In making quantitative measurements of the explosive output of aerial devices, there are at least three general approaches that either individually or collectively should provide credible results; these include: (1) measurements of the sound levels (i.e., air-blast pressure levels) of the aerial devices as they function, (2) measurement of the rate of pressure rise of a sample of burst charge burning within a closed volume (i.e., a standard quickness test) and (3) measurements of the explosivity of the aerial devices (i.e., the blast impulse delivered) as they function. These three approaches are briefly discussed below.

## (1) Measurement of the sound levels of the aerial devices as they function.

High quality, direct reading, instruments are readily available, and are easy to set-up and operate. Two examples of such commercially produced instruments are shown below.



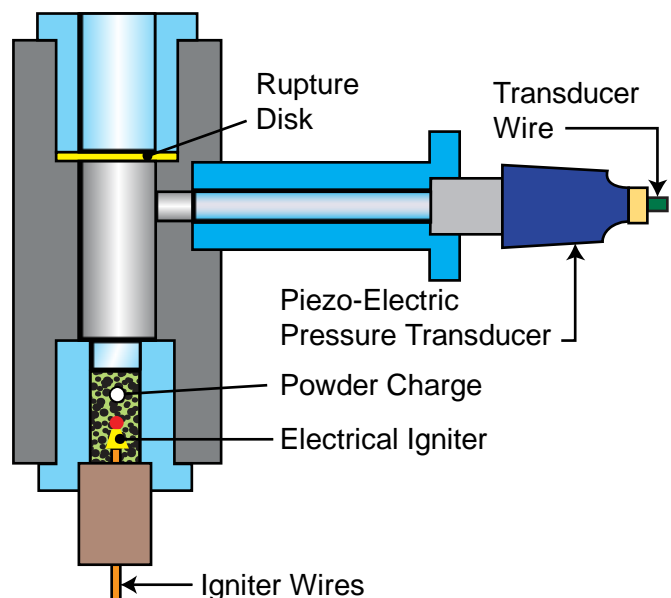
On the left is a self-contained instrument, with a full range of functions and settings, suitable for most envi-

ronmental and many scientific purposes. Also shown in the image (the gray cylindrical item) is an acoustic calibrator for the instrument. On the right (mounted on the tripod and aimed somewhat upward, red arrow) is a free-field blast gauge designed specifically for measuring air-blast pressures from explosions. On the ground below the blast gauge are instruments (blue arrow) to process and record the blast pressure data.

The measurement of sound pressure levels is the easiest and most like the ear test of the three approaches; however, it may not be the preferred approach. There is a long history of the 130 mg limitation on burst charges in aerial devices intended to produce an audible effect. However, a 10 g charge of Black Powder (which is generally not considered to be intended to produce an audible effect) is allowed, unless it is specifically intended to produce an audible effect. Such a charge of Black Powder in a star shell, if strongly enough confined, can rival or surpass the sound pressure level produced by 130 mg of flash powder.

## (2) Measurement of the rate of pressure rise of a sample of burst charge burning within a closed volume.

Measurement of the rate of pressure generation (in units of psi per millisecond or kPa/ms) produced by burning a pyrotechnic composition in a confined space is a frequently used test. Such a 'quickness' test produces results that relate to the explosivity of the test powder, and can easily differentiate between flash powders and Black Powder (including so-called Black Powder equivalent powders). An example of a type of quickness test apparatus is illustrated below. (The apparatus is shown mostly in cross-section, but without showing the threads holding the components together or the means of making it gas-tight.)



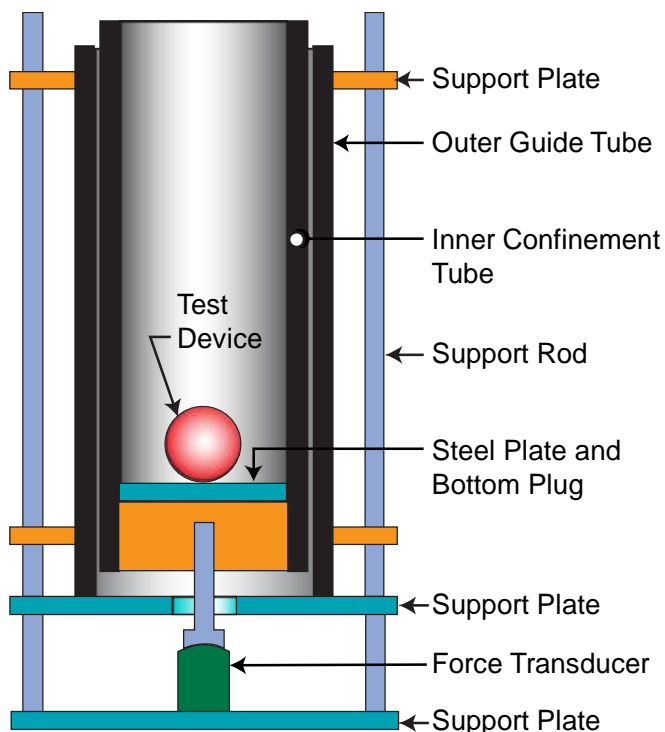
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The electrical igniter in the illustration is an electric match. However, any of a variety of igniters may be used, ranging from a simple hot-wire igniter to electric match assemblies enhanced with various ignition priming materials. Upon ignition, the burning powder charge causes the pressure to increase within the closed volume of the apparatus. The rising pressure is detected by a piezo-electric pressure transducer and is recorded for subsequent analysis. Eventually, as the pressure continues to rise, the rupture disk bursts, releasing the pressure from within the apparatus.

A quickness test is the most direct measure of the nature and performance of an aerial device's burst charge. However, performing a quickness test requires disassembly of the aerial device to harvest a sample of its burst charge. Such disassembly is not desirable, as that raises both safety and disposal issues.

### (3) Measurement of the explosivity of the aerial devices as they function.

A relatively simple apparatus can provide information about the magnitude of the explosive effect of an aerial device as it functions. This can be in the form of a measurement of the physical impulse (i.e., blast force times time) produced as the device explodes. An example of a type of explosivity test apparatus is illustrated below. (The apparatus is shown mostly in cross-section, but without showing the means of igniting the test device or the electrical connection to the piezo-electric force transducer.)



To make a measurement, the aerial device is simply placed into the apparatus and caused to function as

normal. Upon its explosion, the release of internal gas pressure, and the expelled internal components and the fragments of the casing, act against the bottom of the confinement tube. The resulting recoil action is transmitted down to a piezo-electric force transducer, whose output is recorded for subsequent analysis.

This type of explosivity measurement correlates well with the damage potential of aerial fireworks, and, like the sound pressure level measurements, does not require disassembly of the test devices.

### Additional Considerations:

To achieve quantitatively useful results of a measurement, it is necessary to specify precisely the physical conditions for the measurement. Then to use those quantitative results to determine acceptability, it is necessary to set a limiting value for the parameter that was measured.

Unfortunately, neither the CPSC nor the APA and AFSL standards currently specify an acceptable (1) sound pressure level, (2) burst charge quickness or (3) physical impulse for exploding aerial devices producing either visual or audible effects. However, by producing data for a collection of different devices (including those devices clearly intended to exclusively produce either audible or visible effects) credible insight should be gained to aid in setting the needed output limits. \*

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## HEARD ON THE FIRING LINE...

**TRY ANYTHING – MAYBE SOMETHING WILL WORK.** Apparently that's the phenomenon we are seeing in too many of the states that have recently allowed consumer fireworks (or sparkling) for their hungry citizens. Across the country we're seeing more and more cities, towns and counties struggling with this new idea of permitting their folks to enjoy consumer fireworks, and some of the struggling is pretty farfetched. Take Statesboro, Georgia, for instance. The state was one of those hold-out states and only this last July was the liberalization made effective, and that at pretty high cost. Fee for a permanent location is \$5,000, and a temporary (90 day) permit is \$500. The \$5,000 fee goes to the state fire safety commissioner, while the temp fee goes to the city or county. Well, that's not good enough for Statesboro so the powers set the schemers to work. The only leverage they could find in the new state law was ZONING and that's what they grabbed. The city came up with a 90-day moratorium to block "creation or expansion" of fireworks stores. Apparently that's to give them time to figure out some way to keep fireworks out of the city – state law notwithstanding.

**CALIFORNIA AGAIN – IT'S A WONDERLAND** and Alice would feel right at home there. Every year the various cities begin a curious Fireworks Dance during which all the great political minds set to work either to grant S&S fireworks to their citizens, or scheme some way to deny them. It's neighboring cities YES or NO, so buy fireworks at a stand here, walk a block to take them home and face a posse of irate officials bent on seizure and fine. And some banning cities are worse than others. It seems like the same names that pop up in the news reports, over and over. Is it a contest to see which city can be nuttier than another? Take Manteca, for instance.

Here you have city councilmen claiming that the drought makes *any* fireworks use too dangerous. One guy justifies his position by saying that even a spark from a lawn mower could start a fire. It doesn't take much thinking to ask why anyone would want to mow dry/dormant grass! But that's not the main idea that the Manteca bosses are pushing. The new gimmick is to fine citizens \$1,000 when discovered using fireworks. In the case – *here it comes* – of homes that are being rented, the fine goes to the property owner, not to the people actually seen lighting fuses! Yes, you read that right. And it doesn't take a law officer to make the complaint. Council spokesmen say that anybody can make a citizen's arrest if they witness fireworks use. Just imagine the chaos of a group celebrating Independence Day with fireworks and a neighbor walks up

and claims he's making a citizen's arrest of the group. Alice, call home.

**CREDULITY IS THREATENED ON SOME NEWS REPORTS.** Ignorance and sloppy reporting, to say nothing of failure to use a spell checker are all too obvious in some fireworks news reports. This story is very sad but leaves untold what really happened. It was the 4<sup>th</sup> and a father and son had bought a quantity of fireworks. The son, about 4-years-old, was holding a cap gun with a bag of fireworks on the floor of the car. The father was quoted as saying that the kid fired a cap and a spark fell into the bag of fireworks with the result of both ending up in the hospital.

Well, no cap gun I had as a kid was capable of dropping a spark anywhere, and all those consumer fireworks in a bag on the floor of the car would have their hard-to-light visco fuses covered with tape and pressed against the device, with the whole idea being that they are hard to light except by deliberate action. Again, legitimate fireworks takes a hit.

**HOW TO BLOW OFF A FINGER** – or, yes, we have no M80s. This season a lot of press was devoted to two professional football players who suffered hand injuries blamed on fireworks. Now the APA has called on one of them to tell us what kind of fireworks he was shooting at the time. As we all know, illegal bangers can do a lot of hand damage.

**CHINA COMPANY OFFERS FIREWORKS FINANCING.** Somebody named Abby at UP PYRO, apparently based in China, says they are offering "financial support for fireworks importers". The idea is that you will negotiate with a mainland manufacturer and then the finance people take over. They say they will provide from \$100,000 to a million in financing for an interest rate of 1.8% per month.

Abby's e-mail explains that starting up with them is easy: All they ask for is 'company details' and how much you wish to finance. The manufacturer assigns the shipment to them, so they become the shipper. The payment to the seller is made as soon as the container leaves the warehouse. Abby says that 'early payment' will make you a favorable customer, probably ensuring faster processing of your order and maybe even better quality goods. Or if mutual trust is lacking, you can agree for payment to be made a month after the container is shipped, presumably allowing you to view the goods before payment is made.

Advantages claimed: Faster payment to your supplier, thus making you a favored customer; with more money available, the ability to increase your imports without worrying about funding; even freight charges can be included in the deal, removing yet another worrying expense.

Contact is: [abby@uppyro.com](mailto:abby@uppyro.com)





## SPOTLIGHT ON...

### THE CREADORE LAW FIRM

#### An Interview with Donald Creadore

**FB:** *You have been representing the fireworks industry for well over a decade. What do you offer to our fireworks people?*

DC: We offer a broad array of legal and consultation services. That includes not only representing people on regulatory matters, but also we're called in for business, expert consultation, and frequently for a second opinion. This important function is called "second feet" and in a trial I may not be the lead lawyer but sit in as a fireworks litigator and lawyer. We offer solutions and options to our clients for them to consider. Since each client is different, much depends on the client's comfort with risk. Also I am a court certified mediator. I've been an arbitrator for 10-plus years, with over 300 cases to a successful solution. Regulatory matters are important and I remain well versed. We also provide services in business formation, not only in fireworks, but other areas. Contract and employment issues are important today, such as harassment, discrimination and hostile workplace. Litigation issues, especially environment issues and product liability are important. We've had many successful resolutions, including summary judgments in favor of our defendants.

We offer U.S. agent service to companies in China and Europe. We offer soup-to-nuts in matters relating to DOT and EPA. Our client would pay one flat fee and we provide the required legal services. If penalties are applied during ATF or DOT inspections, we can work to get the fines considerably reduced. We can help with the response, which gives the client certainty that the very first step will be properly handled. I am better at my job because of my full circle understanding of the fireworks industry and the various operators.

**FB:** *You didn't mention collections. Given the present economic situation, do you find collections to be a major problem for the industry?*

DC: Collections is a rather small part. The biggest problem is how long the delay has been to where the statute runs into play. But the work of collections for our clients has always initiated other work. Collection work is litigation so I do rely on local lawyers, and over time have developed a powerful network of collections lawyers.

**FB:** *Why did you choose to become an advocate for the fireworks industry?*

DC: Why fireworks? Indeed, I maintain an active practice in New York City, not only in the fireworks industry but in other areas as well. As a litigator I have a



skill that crosses into many areas. That is, I am not a corporate lawyer for stocks and mergers, for instance, but a trial lawyer where disputes are made. It is said, "The tools in a tool box of any litigator is the ability to understand damage control." We understand that there is more than one way to say one thing. Damage control may sound negative, but sometimes it is not. Being an advocate is also being an educator, to educate the industry. The skill of any good litigator is the ability to tell a story, persuasively, sometimes compellingly, always within reason and rationally, and that offers the litigator credibility and a level of respect. Still in this line of thought: I have been writing articles for *Fireworks Business* for over twelve years and that has helped me to gain a broad knowledge of the landscape of the fireworks industry, administrative issues, environmental issues that daily confront the industry. I do not discriminate who my clients are, even those with a poor reputation in the industry. I will work with them to make them have a good reputation through education, etc. I will not shy from a hard case or a tough client, and, in fact, I excel in those cases.

**FB:** *How do you keep informed of the many ever-changing state and federal regulations that are overwhelming the industry?*

DC: I must know how to leverage the regulations to benefit my client, so I stay in touch with the massive information available on the Internet, blogs, etc. I subscribe to the agency newsletters. Since I deal with regulatory matters on a daily basis, I always have my nose in a regulatory book. It is vital to be able to read and understand the regulations and how they fit the industry and when they don't run smoothly.

**FB:** *Is it important that the fireworks industry maintain its credibility with the alphabet agencies?*

DC: While we may disagree with those agencies, we never behave in a disagreeable manner. I've earned my stripes because I maintain my credibility. I've always been reasonable and courteous. I've always been responsive as well. We are not loophole lawyers. We work for the law and guide our clients accordingly. They know I'm prepared. They know I am willing to compromise to work the issues and will not be bluffed into settling improperly. I think having written the column for FB and working in the industry that I've gained a mutual respect with many, if not all of the individuals I may have come across in the agencies. For more than ten years I've had positive relationships with agents; it gives them a level of confidence to know that they are able to work with me. I know that the government realizes, over time, which lawyers they can work with and those they can't and won't work with. I try to disarm people with a sense of humor and that has helped me over the years. ➤

# FIREWORKS BUSINESS

**FB:** *You are admitted to practice in New York. Any other states? How does it work that you can represent someone who is located in a state where you are not allowed to practice?*

DC: I'm admitted in New York, Connecticut, District of Columbia, and Missouri. I can provide consultation in any state. It's called the hub-and-spoke method. I act as a person who provides the technical and legal aspects of a litigation but do not actually make the court appearance. Courts are comfortable allowing to attend by phone conference. The client has a local lawyer, who has no experience with fireworks laws and regulations, and he works with me. I am able to be admitted to any jurisdiction in any state and have never been denied in any state. I use the local lawyer to be admitted, then I cannot use them anymore, but I still keep them on in case I do need them. I don't need to be admitted in a particular state unless it's a litigation, and then I must be admitted in that state. I am a trial lawyer, but I don't really end up doing much court work because most of it is handled out of court. Also, when an unfortunate incident arises, every time I encourage the client to put in an insurance claim (injury to property or person) claiming that the client has the unqualified right to have the lawyer of his choice to represent him. I have never been denied representation by any insurance carrier.

**FB:** *What do you see for us in the next five years?*

DC: This is a wonderful industry. I will trot out my soap box any time. We are in the entertainment business and this industry entertains more people on this planet than any other. But sadly, we will continue to be under pressure from a variety of different fronts. As science advances to being able to detect, examine and evaluate fireworks with even more accurate measurements, the industry will be safer and better. But you have to balance these with the costs, and when they will be available to the mass market.

As science of testing becomes more accurate we should be better detectives for the environment by building better fireworks. It's been my observation that the fireworks industry is a big proponent of the environment but we still are in the entertainment industry.

I continue to see over-regulation. We need to have a separate set of regulations that are particular to our industry so they have to be interpreted with other regulations for other industries that are not fireworks. When I first got on-board over twelve years ago, I thought it could be achieved, but now I don't.

There will be fewer display companies in this country because of over-regulation. We may be coming to the point of charging admission to displays because of the pressures and expenses associated with displays. That may be one solution to surviving and prospering, but that's a client-driven decision, as a whole. \*

## YOU GOTTA GET MAD...

### CALIFORNIA NEWSPAPER CALLS FOR USING PATRIOT ACT AGAINST FIREWORKS\*

**California Capers #26,579, March 8, 2006** - It's got to be the water, or the air, or the granola or something, but once again California is going nuts about the upcoming fireworks season. Cities all over the state have city councilmen fighting about whether or not to permit fireworks sales/use in their bailiwicks, and the newspapers are not helping at all. Fireworks tradesmen are accustomed to seeing distorted, one-sided or outright incompetent newspaper articles; imagine how bad they are in California! And you'd be right.

A few days ago an unfortunate homeowner who was storing some fireworks in his garage suffered an accidental ignition that destroyed his home and caused him some personal injury. Now a local newspaper has seized on his misfortune and is running amok with it. For starters they are advocating that the city council just simply ban fireworks, conveniently overlooking their own statement that residents bring fireworks in from Mexico and Nevada.

Then they are taking the Sheriff's Department to task for not detecting and arresting the poor fellow, even while the police are saying they had staked out the house and did not have evidence for a search warrant. The newspaper even hinted that the sheriff might be lying, without any proof except a hunch.

They even got the city attorney, who should know better, to say the sheriff might have used the Patriot Act to search the premises!

And thumbing their noses at the 25-year CPSC effort, the newspaper claims that "the only place 'safe-and-sane' fireworks exist these days is in marketing literature."

In our opinion, heavy-handed, meat axe editorials should be reserved for real issues. Hinting that city officials are irresponsible, that police are incompetent, and that all fireworks are evil is wasted effort that simply angers people on both sides of an issue. And using the misfortune of one injured man to illustrate a bogus point is one of those things that the instructor in Journalism 101 must have told them to avoid at all costs.

Saying that the sheriff's people couldn't tell cherry bombs from spinners makes you wonder if the newspaper people have ever seen a cherry bomb. I haven't seen one since 1966. Patriot Act indeed! JD

*[\*Reprinted from a FIREWORKS BUSINESS article published in the March, 2006 edition.]*

## WORLD NEWS ROUNDUP

- *New York City, early August:* A new musical production which critics are calling "ultra-hot" is about to open on Broadway. The title is *Hamilton* and the theme is historical. What better way to cap the opening night party than fireworks? Right, fireworks over the Hudson to celebrate the new show.
- *Aug. 5:* In show biz, every up must have a down. Now the Norwegian Cruise Line has announced that their cruise ships *Breakaway* and *Getaway* will no longer present their guests with a free fireworks display off the fantail at the end of every sailing. A spokesman was quoted: "Fireworks are technically challenging to execute onboard and take a very large amount of manpower for an extended period of time..." Yeh, tell us about it.
- *Modugno, Italy, July 24:* The Bruscella factory in this town, said to be working at maximum because of upcoming religious feasts, suffered a series of explosions and eventual fire that killed at least seven people. No other details are available, including the cause.
- *Calais, Maine, July 29:* Maine is one of those states that recently loosened up their stringent fireworks regulations. Unfortunately, the new law offered local option and many municipalities are wrestling with the self-produced problem of how to deal with the details. This city's angst is typical. The City Council understands that the citizens want fireworks, but the historical anti-fireworks memory and a few complaints this season have councilmen on edge. One solution: prohibit the use of fireworks within 1,500 ft. of livestock. That would be a tough call in a farming community, and can "livestock" be defined as the nervous dog owned by the blue-haired matron living down on 5<sup>th</sup> Street who phones a complaint at every thunderstorm?
- *Saugus, Mass., July 16:* Here's a 23-year old fellow living in his parent's home and he likes fireworks. On the 4<sup>th</sup> he had an accident that caused some "burns and hand injuries". Police called the Bomb Squad and they seized some fireworks from his bedroom. Now a local fire official, arrogating to himself some fireworks expertise, was quoted: "Storing these fireworks in his bedroom where they can so easily be exposed to heat, shock, friction and moisture is reckless and needlessly puts himself, his parents and anyone else who entered the home at risk." One wonders if the official happened to notice that all the fireworks said MADE IN CHINA and they didn't travel 12,000 miles by drone. Bicycle, truck, ocean container, ship, rail, truck again and numerous hand carrying were accomplished before the fireworks ended up in this man's bedroom, which was probably the safest place. The only reckless we see is

statements by officials that are inflammatory and uneducated.

- *Massachusetts, Aug. 7:* Yes, it's Massachusetts again, one of the few remaining anti-fireworks holdouts. Now a former state representative is pushing a bill to legalize fireworks sales and use in the state. One of the state Reps. was quoted as saying that enforcement of the current fireworks ban has "difficulties". According to the quote, authorities try to enforce but "have their hands full with other things ... that are just more important to them at this time." Let's point out the obvious: there's a party going on in 49 other states. Get with it and let the citizens join in!
- *Colorado Springs, Colo., July 29:* Apparently they never learn. It's 10 p.m. and police respond to complaints of gunshots and explosions. What they find is a "car full of people" driving around and "throwing fireworks out of the car at homes". As could be expected, one didn't make it out the window so one car occupant was hospitalized for hand injuries. Police said that "alcohol was a factor."
- *Marysville, Utah, July 28:* Here's a freak accident that offers more questions than answers. It's the town fire station, manned by a volunteer fire department. It's the large garaging building and some of the guys are preparing for the Pioneer Day fireworks display. Two firemen are working on a mortar trailer, apparently inserting shells and wiring in the fuses. One man, holding a shell, heard a hissing sound and dropped the shell, shouting a warning to others in the building. Everyone ran but one didn't make it before what some said was about 70 shells went off. That man has since been released from the hospital. The county sheriff is attributing the cause to, ahem, static electricity.
- *Randall County, Texas, Aug. 1:* Here's another sad incident with no cause determined. It was the site of the traditional musical "TEXAS" performance, now in its 50<sup>th</sup> year. Every performance ends with a fireworks display. For the upcoming show a 21-year old assistant stage manager was charged with "checking inventory" of the fireworks stored in two portable containers. For reasons unknown the entire lot exploded, killing her.
- *Council Bluffs, Iowa, July 28:* A neighbor's complaint caused city police to raid a home's garage where they found "a large quantity of fuses and powder". A 55-year old man and a 22-year old woman have now been charged with "felony possession of explosives." As can be expected, eventually the police, the fire marshal and the Bomb Squad became involved. One wonders if this was just a hobbyist who got unlucky.
- *Pendleton, Oregon, July 24:* Yet another story with more questions than answers. A 25-year old man was killed when flash composition he was making exploded. Reporters said he was making IEDs and then said they were just fireworks. No cause, just questions. ✱



# FIREWORKS BUSINESS

## DO YOU REMEMBER...

by Elizabeth Musselwhite

### TEN YEARS AGO, AUGUST, 2005

- The China government removed the yuan fixed against the U.S. dollar; it will now float. Buyers of China goods were apprehensive because the initial reaction was a 2% appreciation in the value of the yuan. One person was quoted as saying that American shoppers in WalMart soon will think they are in Neiman Marcus.
- Chinese-made white/silver comets meant for display use have caused fatalities and now Pyro Labs has determined that some manufacturers in China are using -400 mesh magnalium, turning the comets into bombs.

### TWENTY YEARS AGO, AUGUST, 1995

- Chinese-American gangs in San Francisco had a street gun fight, apparently arguing over turf to sell banned fireworks.
- Wisconsin was said to have abandoned their cross-border anti-fireworks sting because the previous year's operation was said to have cost \$300,000.
- West Virginia and North Carolina were reported to have opened to consumer fireworks sale and use.
- Fireworks Business reported that their survey showed that 70% of fireworks businesses said they had a better year than last. On the other hand, 59% of respondents reported poor quality Chinese fireworks.
- All of the following were reported to be fireworks-related accidents: young man falling off roof after lighting fireworks; injuries from street gunfire in above described San Francisco turf war; people run down by train while standing on tracks and watching a public display; teenagers falling off cliff while watching a display.
- Taggants returned full blown in the new anti-terrorism bill introduced in Washington. Explosives industry members were hardening their attitude about this unworkable idea.

### THIRTY YEARS AGO, AUGUST, 1985

- John Conklin's new book, Chemistry of Pyrotechnics, hit the market.
- Standard Fireworks of India announced that they plan to enter the U.S. market, beginning with their gold sparklers and adding other items as EX numbers are approved.

### FORTY YEARS AGO, AUGUST, 1975

- A CPSC memo advised regional directors to plan to use about half the man-hours this year in "making undercover buys of contraband explosives" [Class B fireworks sold in traditional Class C retail channels.] Com-

plaining that about 700 man-hours were used the previous season on compliance and surveillance, the payoff, they said, was "a couple, no more" of such buys.

- CPSC sent letters to certain fireworks retailers, reminding them that large bangers had been illegal under federal law "for years".
- About 70 former customers and employees of Nationwide Fireworks honored former owners Dave Opperman and Jerry Broad at a celebratory picnic. The firm had closed its doors in April. \*

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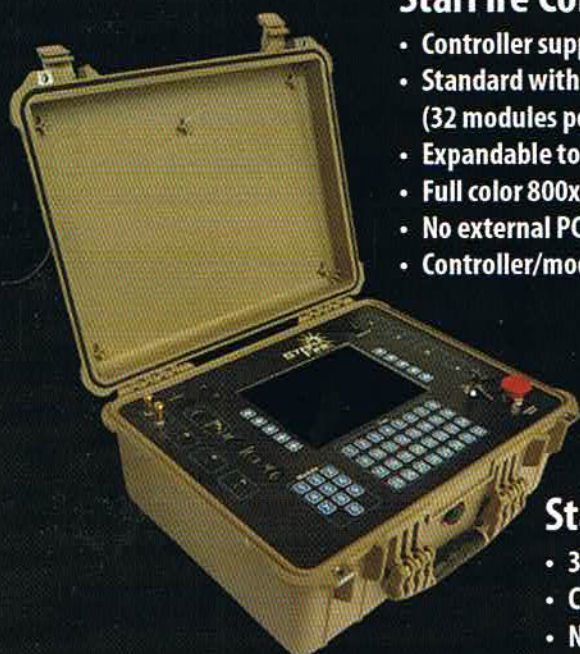
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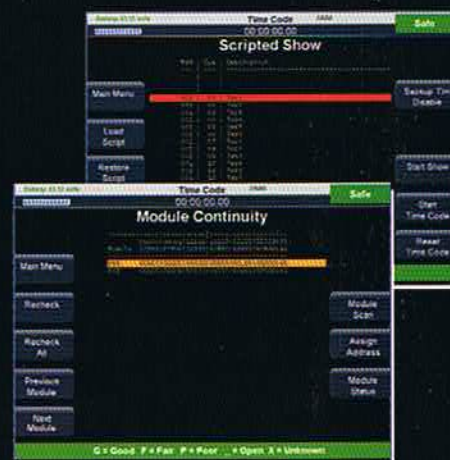
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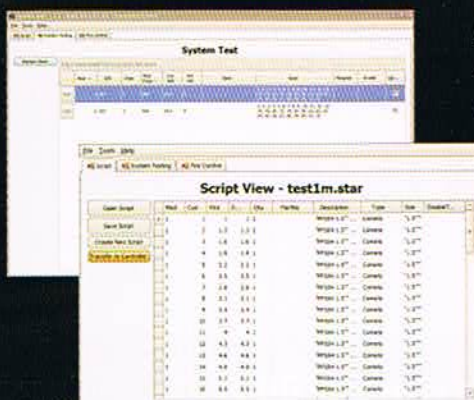
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### Basic Specifications

- 1/100th (0.01) second timing accuracy
- Unlimited simultaneous firing of cues
- PC software included at no extra cost:
  - FSK time code generation
  - Script editing & firing view
- Advanced continuity checking
- Three firing modes:
  - Manual (push-button) firing
  - Sequence firing
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### Additional Components

- Centronics 36 pin M-M Firing Cables
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