



# SPARK

The Official Newsletter  
of the  
UK Pyrotechnics Society



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The **UK Pyrotechnics Society** is the only independent UK organisation that exists to represent the heritage, science, history and art of pyrotechnics in the United Kingdom.

The society was officially formed in 2006, and consists of industry professionals, academics, and enthusiasts of the general public.



We are not a trade association, but represent the interests of a very wide ranging, vibrant membership. If you are not already a member, we invite you to read the newsletter, visit our webpage:

<http://www.pyrosociety.org.uk>

and perhaps even consider joining our organisation?

Richard Harwood Bsc. UKPS Chairman

Some of the information published in Spark is of a technical nature. While UKPS make every effort to ensure published information is correct, we cannot be held responsible for accidents or injuries occurring through use of any information published in the magazine.

Opinions expressed are those of the authors and not necessarily those of the UKPS.

The UKPS does not approve of or encourage any illegal activities connected with the construction or use of fireworks.

*Front Cover - Photographs by Matt Dunford*

*The final explosion from the UKPS special effects day.*

# SPARK - ISSUE 8

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# News in brief

*By Phil Dunford*

## Plans for the year

The committee are currently working on plans for the rest of the year. We hope to have our roadshow at a 'Fireworks Champions' event again, but this year we are aiming to go to Eastnor or Belvoir Castle in order to find a new audience. Another running of the Illuminate Consult course is on the cards, but this is dependant on finding a volunteer to coordinate it. This will be a theory course, as there is now just too much content to combine it with practical work. However, do not despair, as we plan to run one (or more) CAT4 days, where for a reasonable fee, anyone (18 or over) can come, help set up a professional display under the supervision of experienced firers and enjoy the result – possibly combined with a barbecue.

We are also considering a 'workshop' special effects day where we can see what can be achieved with conventional (non-HE) materials.

For the latest news, do check the website and forum regularly.

## ELR

As I write this (May 2011) a huge amount of work is going on, on the ELR committee. I won't preempt the outcome, suffice it to say this is a critical time for the hobby in the UK and we are giving it our very best shot.

## Special Event

I can't let this issue pass without saying congratulations to Sarah and Gareth on their marriage this spring. Myself and my family were lucky enough to be there. A wonderful day ending with a great fireworks display. Have a very happy life guys!



The newly-weds leave the church by steam car.



# 2011 AGM

*By Paul Dack*

This year's AGM, held at The Old Barn in Esholt was a very rewarding day for all who attended. Not only did it give the UKPS the chance to discuss important issues with their members, but members could meet several well known firework businessmen and individuals involved with legislation.

On arrival there were the usual suspects, along with a few new faces. First the update from the UKPS staff explained what had happened over the past year, along with the progress being made with the Explosives Legislation Review. This is an effort to reform and clarify existing legislation in collaboration with the industry and other users of explosives, such as ourselves. This was later elaborated on by Wayne, who has spent the past several years working hard to clear up several grey areas in legislation in order to establish what we are allowed to do under MSER. Richard spoke in particular about the importance of being able to prove competency in all we do.

Following on from the official business, Jimmy Singh from Epic Fireworks spoke about how Epic was born, and various other interesting tales including his recent visit to China. After this, Phil Dunford gave an



Phil blows up a school!

inspiring talk on how he has got children interested in chemistry by conducting pyrotechnic demonstrations then explaining the theory behind them at his local school. He also gave an update on the Wells at Amberley project.

Danny Kay began by elaborating on the previous discussion of the ELR by Wayne, his main point was that we need to prove to the HSE that we are a competent bunch of individuals who can work within the law, he also explained that it may be beneficial to prove this competence by joining the Institute of Explosives Engineers. Danny further explained that it was quite within the law to fuse CAT 3 devices together in a sequence and that shortening or removing a fuse altogether does not



Danny addresses the meeting

constitute an act of manufacture. After this, we ventured outside where Joseph demonstrated fusing techniques, these were then applied to some cat3 fireworks, kindly donated by Epic.

The final talk of the day was an enthusiastic presentation by Max about pyrotechnic chemistry. He explained how colours were emitted, and I'm sure even most of the experienced pyrotechnicians in the room learnt something from it.

A few hours were then given for those that wished to set up the display to do so, whilst Steve demonstrated his flame



Max

projector – an impressive liquid fuelled device that produced a plume of flame several metres into the air. When the sun had finally set, the display was fired, much to the delight of the others who were holding a party at the venue.

Overall it was a successful AGM, and I for one look forward to the next!



Steve's flame projector



Final Display



# News From Amberley

*By Phil Dunford*

We had a very positive meeting with the Amberley authorities early this year. They confirmed that they are very keen for our project to go ahead. Indeed, it is the only new project they are actively pursuing.

Amberley have also expressed an interest in fireworks displays happening on the premises and offered their facilities for meetings etc, so there is the possibility of a very beneficial cooperation with the UKPS.

After a difficult year financially, they are now on a sound footing. They have put some guidelines in place for new projects, which, although entirely reasonable, do affect us in a significant way. These in a nutshell are:

- 1) New projects must be to a high standard.
- 2) All finance must be in place before new projects are started.

The latter is to ensure that they won't end up with half finished projects, or ones that run to a protracted time scale. This has caused them problems before.



*Artist's impression*



Now, our initial plan was to raise £6000 to put up the recovered huts from Wells. However to complete the whole project, including a new museum building, electrical supply, fencing, groundworks etc, will cost something like £25,000 – £30,000. It's possible that due to the significant amount of help we can call on that this figure may end up being less, but it is the kind of amount we are looking for.

James Simpson (Helix on the forum) has recently volunteered to co-ordinate fund-raising, and he is very experienced in this area. However, I would call on everyone to look for possible business or individual sponsors to contribute to the project. Given that Amberley has upwards of 60,000 visitors through it's doors every year and that fireworks have such a 'feel good factor' I would have thought that it would be a sound promotional investment.

The new circumstances do present us with a challenge, but I feel that it is one that we can rise to. This is a perfect opportunity to promote the world of fireworks and one that is unlikely to occur again, it would be a tragedy to let it slip through our fingers...



Model of the proposed museum



# Remember, Remember; A History of Fireworks in Britain

*By Simon Costin*

- Remember, remember the Fifth of November,
- Gunpowder Treason and Plot,
- I know of no reason
- Why the Gunpowder Treason
- Should ever be forgot.
- Guy Fawkes, Guy Fawkes, t'was his intent
- To blow up the King and Parli'ment.
- Three-score barrels of powder below
- To prove old England's overthrow;
- By God's providence he was catch'd
- With a dark lantern and burning match.
- Holla boys, Holla boys, let the bells ring.
- Holloa boys, holloa boys, God save the King!
- And what should we do with him? Burn him!

On Oct 14th 2011 a unique exhibition will open at Compton Verney in Warwickshire. The exhibition is to be designed and curated by the Museum of British Folklore and will feature, amongst other things, the amazing firework collection of Maurice Evans. This colourful and engaging display on the development of fireworks in the UK, will include vintage packaging, drawn designs for fireworks, posters and many hundreds of fireworks themselves.

Starting by looking at the history of fire festivals across Britain, customs such as those in Lewes and Ottery St Mary will be shown with examples of archive film footage. From there the show will chart how the introduction of fireworks into the UK spawned a manufacturing industry here which grew from producing large scale public displays to the more domestic items made by companies such as Standard, Pains Brock's and Astra.

This exhibition is part of an ongoing programme of exhibitions organised by this new venture. The Museum of British Folklore is to be the very first museum aimed specifically at cherishing and researching the UK's rich folkloric heritage. Folklore encompasses an enormous and deeply significant dimension of the cultural identity and social fabric of the British Isles. It covers a tremendous spectrum of human expression; deeply creative and idiosyncratic, the folk arts span dance, art, craft, music, games, songs and seasonal customs.

The vision is to encourage greater public awareness of the rich and continuing tradition of folklore as a vital component in the social fabric and cultural identity of the British Isles. The museum will aim to help redefine what a museum is in the 21st Century and take folklore to new audiences, challenging traditional perceptions, and demonstrating its continued relevance.



Artist's impression of exhibition

They hope to do this through establishing a thriving, properly funded Museum, which celebrates and safeguards the cultural heritage, vernacular arts and seasonal customs of Britain. At the moment there is no major national, dedicated institution that explores and celebrates our folkloric heritage.

Providing a very different type of Museum experience, the selection of objects and programming will be as exceptional and strange as the subject matter it pays tribute to. The aesthetic sensibility and attention to detail will ensure a magical and multi-layered experience involving arts, music, people and objects. The Museum and its collections will be at the core of the enterprise, with a host of surrounding activities, such as artists' residencies, music/art festivals, community projects, research and education. While the museum director, Simon Costin and his team are in the process of applying for funding for the project, a series of regional exhibitions will be mounted throughout 2011–2012. Details of these can be seen on the museum website:

[www.museumofbritishfolklore.co.uk](http://www.museumofbritishfolklore.co.uk)



# Triple H Bomb

*By Practicus*

Although we might have the odd moan about how the Chinese have taken over the fireworks business, there is no denying that they can do some remarkable things at a very fair price.

This month I'm looking at a large consumer cake, the Triple H Bomb.

What they manage to pack into each tube, is almost beyond belief!

Once the pretty paper is stripped off, you can see the simple way that visco is used to convey the fire from shot tube to shot tube. Card is zigzagged around the tube, to stop the fire skipping to the next row.



Although the contents of the tube are not all the same, they are similar in construction.

Here is a typical one.

You can see where the visco passes through the lifting charge of black powder. This will propel the first unit to firing height.



Next we dissect the inner unit.

At the base (left of picture) is a black layer, which ensures ignition & provides some tail effect. This then passes to the pink layer, which leaves a coloured tail and delays ignition until the unit has reached its apogee.



The layer with the stars then fires. This bursts the tube and spreads the stars and also starts the next unit!



This is similar to the previous one with primer and effect/delay. I have removed the stars and bursting charge to show the paper fuse which goes into the burst cavity to ensure ignition.

This expels the final unit which is a marvel of miniaturization!



As you can see, it again has effect/delay and finishes with a burst of stars and flash powder.

Thus, three bursts are achieved, giving the triple H-Bomb effect.

To get all this to work once is pretty good going, to repeat it for the 25 tubes of the cake and the thousands of units made, is little short of a miracle of firework engineering!

## Details of parts

First unit weight	32g
First unit propellant	2g
First stage stars & burst	4.5g
Second unit weight	15g
Second unit stars & burst	2.5g
Third stage unit weight	4.5g
Third stage flash & stars	1g



# Did you know the UKPS has an online shop?

You can visit it at:

[www.pyrosociety.org.uk/shop](http://www.pyrosociety.org.uk/shop)

All proceeds go to UKPS funds.

Among the newer items available are:

Keyrings at only 50 pence



Reproduction copies of Spark 1 & 2 at £2 each

and of course, our popular reproduction Wells posters at £5.

**Order today!**





# You were only supposed to blow the bloody doors off!

*By Phil Dunford*

Thanks for the title Roger!

It's not often that ordinary people get a chance to have practical experience of high explosives. Also, it's not an area UKPS would normally be concerned with. However, HE is sometimes used for spectacular special effects and the committee decided that a training day was too good an opportunity to miss!

Member 'Pyromancer' (Steve Miller) does this sort of thing for his day job and kindly agreed to arrange a training day for us.

Consequently, early this year, about 20 of us found ourselves at a secret location in the South of England ready for a very exciting day.

Steve had several helpers (some from the special forces) and many thanks to them all.

The day started with an overview of the principles, with heavy emphasis (quite rightly) on safety. We were shown a variety of gruesome photographs to make quite clear the consequences of an accident.



Det cord & Perunit ready for use

The rest of the day consisted of a series of more and more spectacular setups, which can best be illustrated by pictures taken on the day. Everyone had a chance for 'hands on' work.

We were mainly working with the commercial explosive 'Perunit' and with detonating cord, but later in the day we were introduced to other materials including 'ANFO' (ammonium nitrate/ fuel oil).

The first set up was simply to suspend the explosive from a cord to get an air burst and appreciate just how powerful these materials are.

Even for those of us familiar with the power of large shells and maroons, the size of the explosion and the deep sonorous boom were very sobering – ever from our 300m vantage point.



Air burst explosion

Next, the explosive was buried, which produced a very respectable ‘First World War’ type of effect. it also produced a sizable crater in the soft earth of the field.



Attendees inspect a crater

All the explosions were initiated by a ‘Shrike’ exploder, which tested the circuit, allowed us to be a long way away and packed enough punch to set off the commercial detonators.

Finally in this series of tests, det cord was wrapped around a 1 litre plastic bottle of petrol/ diesel to give a huge fireball of the kind that are expected in films!



A fireball explosion

In the smaller setups, everyone had a chance to undertake every part of the process. As we progressed to larger demonstrations, the individual tasks were split up between team members.

Next we tried making the explosions look more spectacular by layering compost and fine calcium carbonate powder on top of the charge. This resulted in a huge cloud of dust, which had a long hang time in the air. Steve demonstrated an even larger version of this, fired by his trusty plunger – it took several minutes for him to reappear from the cloud!

lastly, we arranged a series of fireball explosions, timed in quick succession by a non-electric fuse. This gave the appearance of a ‘strafing run’ as the explosions spread across the crest of the hill.

The biggest setup was reserved for the end of the day.

On another part of the site, we wired up an old car, for a movie type explosion.



Dust Explosion



The Big One!



Strafing Run

Bags of fuel mix were placed strategically around the wreck, with mats of det cord beneath them. These were again linked by non electric fuse.

After retiring to what seemed to be an excessive distance and Steve fiddling about for what seemed an excessive time the rig was fired and three satisfying explosions occurred. What Steve had not told us, was that earlier in the day, he had placed about 7Kg of extra explosive under the car. Shortly after the third fireball, a massive explosion occurred, rocking the ground and sending the car high in the air to land in several widely scattered pieces. The back end landed 100 meters to the left, the engine block 200 meters to the right and later we found small parts as much as 400 meters away – perhaps the safety distances were not excessive after all!

A spectacular end to a great day. Thank you Steve and all involved and to all the attendees for parting with their money in a good cause!



Rigging the car

(See front page for the results!)



The usual suspects pose at the end of the day



# Plaistow Firework Memories from the mid 1960s onwards

*by Keith Brock*

It's difficult to know where to start in trying to give an account of my childhood during the 60s in East London without including other exploits, although for this article I will try and stick to pyro related incidents/stories.



The build-up to Guy Fawkes night always began in mid October.

Standard Fireworks had just started their slightly annoying TV adverts with kids singing a verse of "Please do remember the 5th of November, light up the sky with Standard fireworks", but in and around the 1950/60s council estates & dilapidated Victorian terraced housing in Plaistow East London, newsagents shop windows were blazoned in banners of Astra or Standard with the occasional Pains-Wessex, Brocks thrown in for good measure.

British Firework types with names like Golden or Silver Rain, Crackling Cauldron, Emerald Spray, Air Bomb Repeaters, Screamer Repeaters, Helicopters, Thunderbolt, Mighty Atom, Dynamite, Crasher, Traffic Light, Flood Light, Snow Drop, Mount Etna, Mini Rockets, Jumping Jacks, Jack In The Box, Hand Held flares, Electric Sparklers, and Bengal Matches to name but a few were abundant in almost every glass display cabinets.

But equally intriguing was the sight of egg carton type Guy Fawkes masks that were also sold in local independent toy stores like Chambers opposite Upton Park tube station. These came in garish fluorescent colours to include red, orange, blue, yellow and green, all with the facial features highlighted in black.



Each year, and depending on the supplier, the designs changed slightly, but before purchase there was always the inspection for possible flaws in the manufactured article, this could be thinning, rips & punctures in the cardboard, or to see that the thin white coloured elastic band was securely in place.

Then there was the hunt around the dumps or debris (as we called it) for old abandoned push-chairs or pram wheels to make go-carts to carry guys around in.

A typical cart was basically made with anything you could get hold of, but usually consisted of a 4ft or so long plank of wood held together with nails, nuts, bolts, washers and curved brackets that we bought from Derricks Job stores in Green Street (sort of 4 candles Two Ronnies sketch type shop) whereby we attached the shaft & wheels, along with some cotton type washing line cord for steering the front wheels with your feet, and to include an upturned orange box crate for the seat, there were no brakes, you and your mates piled-on and just launched yourself from a hill (In our case `Carter Road` Bridge) and hoped that a car wasn't coming across your path at the bottom.



Also on Thursdays & Fridays at teatime, I would try my luck Guying outside Plaistow underground station in the hope of catching commuters returning from work with there weekly small brown enveloped wage packets.

But for me, one of the most lucrative pitches to be exploited during the week was the row of shops between a bookies and newsagents at Pelly Road (bridge) and Terrace Road. The usual pleas of “penny for the guy mister” directed towards passing punters was the norm in the days leading up to the 5th.

On one particular occasion, I can distinctly remember one man’s fleeting glance at my efforts as I clocked him leaving the betting shop with an Evening News newspaper protruding from in his back pocket. All of a sudden he stopped, back-tracked a few paces, and took out a wedge of readies (I guess his winnings for the day) before flicking a folded 10 bob note into my oxo tin of spare half pennies, pennies , threepenny bits and sixpences. I could not believe my luck, “Arh Thanks Mister” I shouted in hesitant disbelief as he disappeared into the darkening afternoon light never to be seen again.

If I recall, I think I made about one pound seven shillings and sixpence

for a couple of hours work that afternoon/tea-time, this of course was a bit more than usual, and was greatly appreciated, I carefully counted and fed most of this into my tinplate post office shaped money box when I got home, although a few black jacks & red coloured liquorice shoe laces on the way never went amiss.



So did my takings rely on good fortune, tenaciousness, or was Guy making an art one acquired by practice?

Well I would like to think my infant school days at Upton Cross junior school had something to do with it. I can distinctly remember making papier-mâché faces by applying strips of newspaper mixed with wallpaper paste onto blown-up balloons, these were left to harden until the next day in readiness to paint or attach a mask, but like many Guy making school kids, we also either drew a face on some brown paper/card or bought a mask if we had enough money to spare.

The rest of the Guy was put together in the usual way with old jackets/trousers sewn together and newspaper stuffed in the arm & legs and then tied with rough string.

Although in the latter years of my boyhood, I did have one inspired bonfire season. I remember rigging a bought cardboard Guy Fawkes mask to create glowing red eyes. This elaborate effort was achieved by using red `Quality Street` wrappers to encase two bicycle lamp light bulbs linked to an `Ever Ready` battery that was poked through the masks eyes. I then inserted a red tipped white candy cigarette sweet in the mouth for a cool effect, this was topped off with a flat cap I borrowed from dad`s wardrobe.

Then there were the local street bonfires. Many a damp/musty/smelly camp (den) that we built and played-in on the dumps during the summer months were eventually used as fuel for the bonfires. They were made from rotten discarded old mattresses, settees, doors etc, along with scavenged wood joists & floor boards from the remnants of bombed-out London houses some 20 years or so earlier & became the main stay & centre column which everything else was built around, although once



partly built, this also was a sign for local households to dump their unwanted junk as well.

The bonfires were at least as high as a house, and averaged 20ft wide at its base. I remember one year when ours was sited on a narrow stretch of wasteland a few feet from a chain link fence that separated the District and Fenchurch Street railway line from the road almost opposite two tower blocks (Willett & Scott House ) in Queens Road West in Plaistow. One of the boy's fathers, who was a local councillor, decided to call the fire brigade to reduce it size for safety reasons, looking back I guess he had a point, but all we did was rebuild it again once they went away, although admittedly it was slightly smaller but still impressive.

In the end, no accidents involving bonfires ever happened on our watch (we even checked for hedgehogs before lighting), except for incidents of other gangs from the rougher Manor Road area near West Ham Tube trying to pinch our wood for their own fires, but they soon legged it once the older kids' brothers made their presence known.

Sometime in the late afternoon of the 5th a Guy was attached to the top before we lit the bonfire as soon as it got dark, and then gathered around to enjoy the roaring spectacle and radiant heat to counteract the damp chilly nights. Towards the end of the dying fire we would push potatoes wrapped in silver foil with sticks into the embers, the potatoes were always charred but soft in the middle and taken home & served with butter & cheese and a cup of Bovril as a reward for our hard work, delish!

Sometimes when the 5th fell during the early or mid part of the week, I would often resist from letting-off many of my fireworks in my back garden in anticipation for my sister-in-law's mum (aunt May as I called her) to invite us to a back garden party on a Friday or Saturday in Fanshawe Avenue, Barking, Essex.

Upon arrival we would compare our collections with my sister-in-law's cousin's kids and then spend the next few hours letting them off individually under the watchful eye of our peers, to a dustbin size bonfire blazing away in the background, because we didn't want it to end.

I guess the average total value of my fireworks tin was about £5 to £6. This together with the others amounted to near on £20 worth of fireworks, although it has to be said, my dad did not share my enthusiasm for shop bought fireworks. He thought they were a waste of money, instead he

preferred taking me to the big organised River Thames displays that were normally part of the Lord Mayor of London celebrations, so in essence all of the fireworks were bought and paid for by myself from the proceeds of Guying.

Fireworks in those days were kept by almost every boy in a biscuit tin under the bed, every now and then the compulsion to lay them out on the floor and stare (or should I say daydream) at the mostly two/three colour but intricate ornate labels was a regular habit. The smell of sulphur, gun powder, glue, cardboard, and the slight coating of blue touch paper on your hands with the odd leaking remnants of gun powder in the tin was beautifully intoxicating but inwardly joyful.

What we got up to:

Astra Bangers – I once sneaked a packet into `Harold Road` secondary school. We would discretely light & discard them into the tin roofed shed at break-time. After hearing the roar (fizz) of the fuse, everyone would run or hide in anticipation of the blast echo which was quite loud. If we got caught in possession of fireworks, it would be six of the best (the cane) from the headmaster.

After a few near misses though, we would sneak out of the playground and hide them in front garden privet hedges just before break time had finished in case we got frisked on return.

Then sometimes on the way home from school we practiced the usual banger in a empty milk bottle experiment, where we were convinced that the bottle would crack or explode, but almost never did, (i.e. just ended up a smoky grey & brown stained/burnt), although I preferred using jumping jacks.

I can even remember some of us launching bangers high in the air via catapults on the vast wastelands, which reached distances of 70 yards or so, although this was sometimes a bit too scary & foolish to attempt on a regular basis because it was impossible to gauge the time of the fuse burn on each banger accurately enough.

Mini Rockets – Such a cute small but simple comet type tail firework, these were launched from a wooden post that had two U shape nails hammered into them, although I can remember sneakily launching one or two from some of the street's car exhaust pipes.

Rockets – Most Rockets were not the cheapest firework to buy, and to me were always a bit of a let down in terms of their poor burst quality and few stars, although the parachute type were great because of the longevity/glow.

Occasionally on other vast wastelands away from my area, and as a sort of revenge against other gangs trying to nick our wood, and when no one was looking, we would launch rockets from sterilized milk bottles at 45 degree angles from a mound of earth, aimed at their bonfires the day before, in a feeble attempt to light them.

Aerial bombs – There was an occasion when me and my brother cut an inch off the top of my mum`s back garden metal washing line pole. Into this we inserted a fully lit (fizzing) Standard Aerial bomb, and then as the shell left the pole (it can only be described as a “Phlume” sound), the lower than normal height blast was loud and scary, in fact we ran indoors out of nervous giggling & embarrassment hoping the neighbours with their twitching curtains would not spot us.

Match guns – Basically I made theses with two different wooden clothes pegs, you dismantle and reversed the spring on one half of the peg, then cut or filed a preexisting pronounced groove in the peg to slide & hold the spring in place, then you either glued or placed some sandpaper or used the Swan Vesta striking side which was slid over the non spring peg to trap the match before pulling the spring to fire the lit match some 12ft or so.

Bengal Matches – Although not classed as a firework, these red or green matches were very cool and one of my favourites, even the girls liked them!

The only regret I have is that I have no bonfire night related photos from that era, although I think there is one of me on the front page of the ‘Newham Recorder’ playing on an abandoned burnt out car in 1967.

Great fun was had by all, although it would be foolish of me to condone some of my exploits for obvious reasons, but then again we were just slightly mischievous kids who loved to experiment, but at the same time we respected our elders and the police out of fear.

(Stock Photos)



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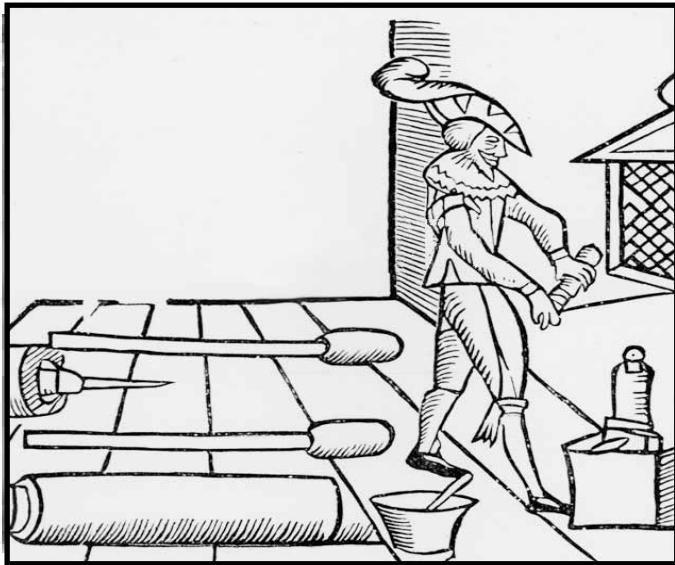
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(Please DO NOT use any previously published addresses)



Luigi inadvertently invents giant cotton buds

# Answers to Spark 7 Crossword

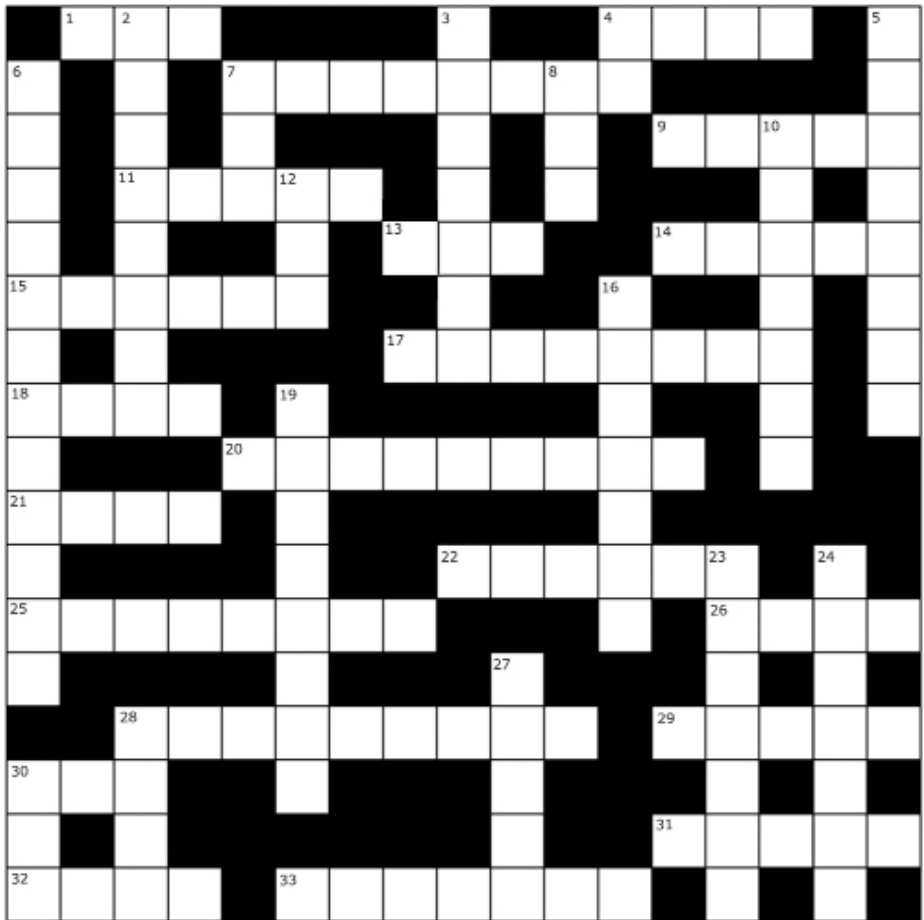


## From Dreams by Jerome K Jerome

*Human thought is not a firework, ever shooting off fresh forms and shapes as it burns; it is a tree, growing very slowly — you can watch it long and see no movement — very silently, unnoticed.*

# Spark 8 crossword

*by The Green Man*



Across:

- 1) Unit of current.
- 4) A type of tree imitated by some shells.
- 7) Seafaring town that hosts a firework competition.
- 9) Most firework cases are made of this.
- 11) Greek island where rockets are fired at churches.
- 13) A useful plastic fuse that used to be made by ICI.
- 14) A Roman meeting place.
- 30

- 15) Mix with petrol for maximum fireball smoke.
- 17) This creature can hide in your bonfire.
- 18) Five hundred sheets of paper.
- 20) Element that burns red.
- 21) Heavy metal used in ball mills.
- 22) Element that burns green.
- 25) To burn slowly.
- 26) Ancient name for all gasses.
- 28) A type of power used in presses and diggers.
- 29) Suitable post-display drink for West-Country pyros!
- 30) The heart of your computer.
- 31) Many \_\_\_\_\_ chemicals have been banned from fireworks.
- 32) A substance that can donate electron pairs.
- 33) The level of physics where firework colours are generated.

Down:

- 2) Loud Spanish firework.
- 3) Traditional accompaniment to fireworks on November 5th.
- 4) Measure of acidity/alkalinity.
- 5) Is this firing system your friend?
- 6) Loud battle simulation firework.
- 7) USA equivalent of UKPS.
- 8) By product of petrol distillation occasionally used in fireworks.
- 10) A pyrotechnic composition producing flame when heated.
- 12) Sometimes used to phlegmatize sensitive compositions.
- 16) Modern equivalent of Dynamite.
- 19) Famous manufacturer.
- 23) Modern plastic time fuse.
- 24) Toxic element associated with old lace.
- 27) Do this to the sky with – 19 down– fireworks.
- 28) Fireworks are still made in these small buildings.
- 30) You should have a bulkhead between this and your load.

Answers in the next issue – or if you can't wait that long, go to:

[www.thegreenman.me.uk/crossword8.html](http://www.thegreenman.me.uk/crossword8.html)



We welcome any firework related articles for publication.  
Please send to:  
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**Important note: It is possible that the editor (and  
the membership secretary!) will be changing  
address in the next few months. We will put an  
announcement up on the forum if this happens.**

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