

PETER CHILD

ARTIST'S PYROGRAPHY MACHINE MANUAL



SAFETY PRECAUTIONS

The points get very hot and can start a fire if mis-used. Do not use the pyrography machine near highly inflammable materials or liquids and polishes which produce inflammable vapours. NEVER let the hot point touch the mains cable as it could quickly burn through the insulation. Keep all cables clear of the work area. Do not lay the pen down - get into the habit of storing it in the clip on the power unit. Keep the hot point clear of your skin and clothing.

Take adequate precautions to avoid breathing fumes and smoke. A small desk fan is the minimum requirement. Ensure adequate room ventilation. If you suffer from any respiratory complaint take specialist advice. Fans with carbon filters are available. Do not breath in fumes from burning plastic or synthetic materials. Avoid using wood which has been coated with a synthetic polish or varnish and avoid burning on MDF. Burning some fabrics, leather or cork may produce harmful fumes so take suitable precautions.

Always ensure children and people with learning difficulties are correctly supervised when the machine is in operation. Machine cables must be kept clear of the working area at all times and the ventilation slots free from obstruction.

Do not leave the machine switched on unattended. Protect the unit from damp and rain. Do not use if wet.

Do not let the pencil terminals touch together, short out against a metal object, or touch the case of the control unit. The control unit will be damaged if subjected to prolonged short circuits.

Do not open the case of the control unit without first disconnecting the machine from the Mains. Live terminals are exposed inside. Do not attempt to service the control unit without specialist knowledge.

Do not use the control unit to power any other appliance. The pen will not work from 12 volts or from any other transformer. Do not use the pyrography machine for any other purpose than pyrography.

GETTING STARTED

Please read the safety precautions before first use. Before switching on, make sure the point is not touching anything and turn the heat control knob to minimum. Switch on then slowly advance the heat control clockwise until the point glows a dull red. Too high a setting can quickly burn out a fine point.

Practice strokes on a scrap piece of smooth white hardwood. The technique for producing evenly burnt lines is quickly acquired. The secret is light and even pressure combined with even speed of stroke. Notice that any slight hesitation during the stroke will result in a “blob” because the depth of burning, or the width of a line, depends on contact time rather than pressure.

If you want a thick line, move the point slowly to give the point time to burn the wood. If you want a fine line move the point quickly using very little pressure, starting and finishing the stroke in the air to avoid a blob at the beginning or end of a stroke. Never press hard as this will bend the point (you can bend it back using pliers).

See how many different effects and textures you can obtain by various different ways of applying the point to the material. The beauty of pyrography is in the rich palette of different shades of brown obtainable, which give a subtlety to the image not available in other mediums such as pen and ink which are limited to one tone.

Points

The standard fine loop is best for general work but the spoon shape point is good for shading and the edge of the spoon is very useful for special textured effects or fine lines.

Setting the heat

The heat control is normally left at one setting and the depth of burning varied by using different speeds of stroke. The best heat control setting will be determined after a little practice and depends on the individual’s technique. However, the best advice is to keep the temperature of the point so the red just disappears. Too much heat, creates unwanted smoke, makes the point bend easily and can give fuzzy, scorched outlines.

Some users blow on the point to cause a temporary reduction in temperature rather than fiddle with the knob.

The setting is the number at the top of the dial. The numbers on the dial are only intended as a rough guide to help you remember your favourite settings. They are not calibrated in any way and can vary from machine to machine. Older models may give a different tip temperature for a given setting on the dial. Thicker points need a higher setting to get a given temperature. The general rule is you should be able to see the point glowing red but if it is a bright orange or yellow, turn it down.

SOURCES OF PATTERNS AND DESIGNS

It is not necessary to be a talented artist to do pyrography. Even if you are not adept at freehand drawing you can copy designs and line drawings from books

etc. You can trace designs and transfer them to the wood using carbon paper or preferably graphite paper. You can zoom designs up and down in size using a photocopier. If you place a photocopy or laser printed sheet face down on the wood you can transfer the design by “ironing” using a domestic iron. This works because the ink (or toner) melts with heat. Transfer the minimum needed to give you a guide to the pattern. You cannot get rid of excess toner.

MATERIALS FOR PYROGRAPHY

The machine can be used on wood, leather, cork and certain plastics and fabrics. It can be used for shaping, welding or cutting thermoplastics and tooling wax models provided there is adequate fume extraction.

Wood

The best wood to use is a hard white wood such as sycamore, maple, holly, hornbeam or boxwood. The harder the surface is, the better the result. Dark woods can be used but they will not give such good contrast. Good results are difficult to achieve on softwood (pine) because it is so soft and the resin gums up the point. Wood which darkens with age such as fruitwood (eg apple, cherrywood) will gradually lose contrast.

Plywood

A good, economical material to practice on is birch plywood obtainable from DIY stores. Choose a hard, white sheet. Birch is rather soft however, and it is difficult to achieve fine detail.

Veneer

An excellent surface is sycamore veneer stuck onto a rigid backing such as MDF. You can use iron-on glue film or contact adhesive to mount the veneer. You can buy veneer and glue film from specialist veneer suppliers.

Bought objects

You can decorate finished items such as cheese boards and wooden spoons bought from kitchen shops or from specialist pyrography suppliers. Usually you will need to smooth the surface with fine sandpaper before you use it.

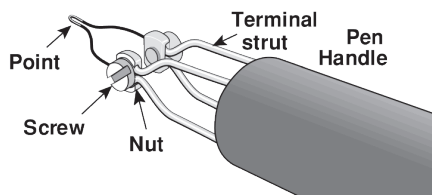
Leather

Leather can be easily worked and gives a good contrast. Use light coloured vegetable-tanned tooling leather if you can obtain it. Do not breath the fumes.

Cork

Cork mats or sheets of self adhesive cork applied to a firm substrate offer an alternative surface and can give very striking results.

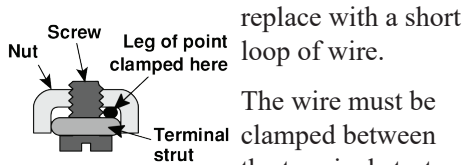
CHANGING THE POINTS



To change a wire point proceed as follows :

Switch off and allow to cool for a short

while. Loosen the terminal screws taking care not to bend the terminal support struts. Remove the old point and replace with the new point or alternatively



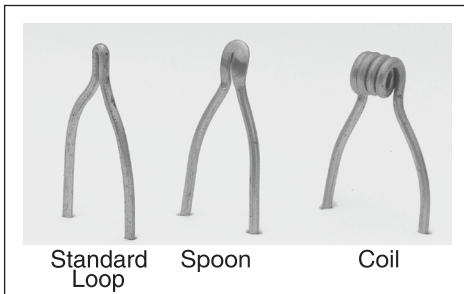
replace with a short loop of wire.

The wire must be clamped between the terminal strut

and the nut, not under the screw head. Tighten the terminal screws taking great care not to bend the terminal support struts. Squeeze the point into shape with pliers if needed. You can buy a spare pencil to hold a different point and plug it into the transformer when needed rather than having to continually change points on the pencil.

POINTS AVAILABLE

Currently only standard loops, spoon points and coils are available.



Most work can be done using the standard loop or the spoon point. Normally standard loops are used for detail work and the spoon point is used for shading. The edge of the spoon point can be used for fine lines, fur, feathers, grass etc.

The coil develops a lot of heat for heavy

burning of large projects such as house nameplate lettering. Used just above the surface it can be used to “toast” the wood to give a soft edged burn mark.

The special points described in the following pages have to be made by you.

MAKING YOUR OWN POINTS

You can purchase the special wire (an alloy of nickel and chromium called Nichrome) in various thicknesses and make your own points. Use only Nichrome wire or you will damage the machine. You will need wire cutters, fine pointed-nose pliers and possibly a small hammer and anvil. The anvil can be improvised using an axe head or large hammer head fixed in a vice. A set of needle files is useful for shaping points. The wire is available in small reels and each reel can make 200 points or more. 26 S.W.G. (Standard Wire Gauge) is the finest and 23 S.W.G. is the thickest wire which we normally supply. Note that the smaller the S.W.G. number is - the thicker is the wire.

MAKING LOOP POINTS

To make a standard point, cut off 30mm (1¼”) of 26 S.W.G. wire and bend it in the fingers into a U shape. Fix it into the terminals so it can be securely held by the screw clamps and tighten carefully so as not to strain the terminal supports. Then squeeze the end of the loop with pliers so that the wire touches together at the end for about 3mm (1/8”). This will concentrate the heat at the end.

Standard loop points can be made from 26, 25 or 24 SWG. Thicker wire is not

recommended and may overload the machine.

POINTS FOR SOFTWOOD

The resinous and uneven grain of softwood (pine) is difficult to burn evenly because the normal point tends to dig into the soft parts. A point with a large area of contact will minimize this difficulty. A spoon point can give good results.

The point will gum up with burnt resin quickly and a piece of coarse wire wool or a fine wire brush will be useful for cleaning off the deposit.

POINTS FOR FINE WORK



Standard loop points may be filed or ground down to a needle point. Extremely fine lines can be produced on a hard wood such as boxwood with these points. Hammer the end flat then cut and file or grind to a point. As the point will be very weak,

do this while mounted in the pen and be careful not to break it when changing points

POINTS FOR FINE LINES AND FEATHERING

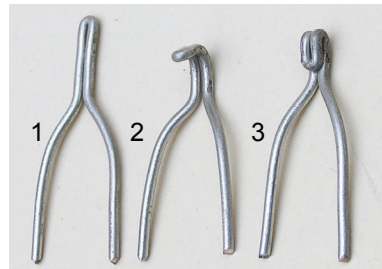
It is difficult to burn straight lines evenly because the point tends to dig into the soft parts of the grain. If a point made from thicker wire such as 23 S.W.G., is

hammered flat at the tip and filed to a knife edge profile, lines can be drawn much more evenly. This point is also useful for feathering bird carvings, shading and can produce interesting textures.



POINTS FOR HEAVY WORK

More heat is generated in the point if an extra long loop is bent back on itself. These can be made from 23 SWG wire (minimum 40mm length) They are best formed with small pliers while red hot (to make it easier to bend). It is a good idea to squeeze the point really compact



whilst red hot, using pliers. It might be thought that the current would be shorted out where the loops touch and this may well happen with a newly made point, but in a short time a coating of oxide will form which insulates the wire and then the point will brighten up visibly.

An alternative heavy duty point can be made by winding the wire around a stout needle held in a vice, to produce a compact coil. The coils should be closed up with pliers (while hot) to give

maximum heat. These points are capable of quickly burning the lettering used on house nameplates and similar work. They produce a textured effect (many parallel lines) and this is useful for producing feather effects on decoy birds. The coils can be filed smooth to get rid of the textured effect. Provided that the removal of metal does not weaken the point too much or cut through it, points can be filed and cut as much as you like to produce special shapes and effects. Thinning down the end of any point will concentrate the heat in that area and make the point more efficient. It will also take less current from the power unit and the handle will run cooler.

Because the folding or coiling up process gives more electrical resistance, thicker wire can be used for these points without overloading the machine.

POINTS FOR SHADING

A large area of contact with the wood is required for efficient



shading. A spoon point (shaped like a miniature SPOONS teaspoon 2mm wide and listed as in our price list) can be used or a standard point can be hammered out flat on a hard metal anvil such as the head of a hammer held in a vice. If necessary any sharp edges can be removed by rubbing on abrasive paper.

A useful point for fast shading of large areas is a heavy gauge coiled point, as previously described, which has been filed or ground smooth. This

takes skill to make but is worth the effort. A smoother surface can be given to any point by polishing with very fine abrasive. A polished point is an advantage because it picks up less tar and ash from the wood.

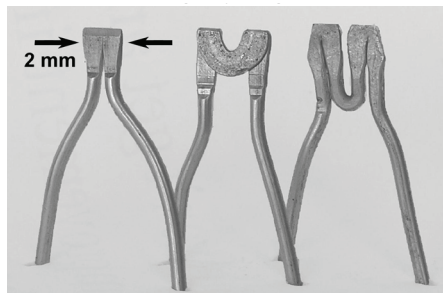
POINTS FOR DECORATIVE PATTERNS



Small brands can be shaped from wire and used for repeat decoration. These are formed by using small pointed pliers and must be accurately made so that the whole of the pattern touches evenly in use. 23 S.W.G. wire is needed for rigidity.

POINTS FOR LETTERING

These points have been hammered flat while hot and then cut or folded over to give a straight edge at the tip. They can be made slightly angled to left or right for use in the same way as calligraphy



pens. They can be filed to the exact width required.

PREPARING THE WOOD SURFACE

Flat wooden surfaces should be planed or scraped and well sanded. For best results plane by hand with a razor sharp smoothing plane and finish by rubbing with the grain with 400 grit abrasive paper or cloth. If the surface has been machine planed, you first need to remove the ripple marks (made by the planer blades) with coarser abrasive. Try 240 grit followed by 320 grit, then the 400 grit. Wrap the paper around a small sanding block to get best results. Our woodturning supplies catalogue lists a large range of abrasive paper, cloth and abrasive nylon matting (Webrax). Non-flat surfaces such as turned articles may also need to be sanded, again using coarse, medium and then fine abrasive paper. Veneer just needs sanding with 320 and then 400 grit paper.

PROTECTING YOUR WORK

Your finished pyrograph should be protected from dirt and the bleaching effect of strong light. You need a coating which will seal the wood but not darken it or yellow with age. We recommend water based acrylic finishes because they are durable and easy to apply. They dry in a few minutes to a film which is barely visible and will not take away the freshness of the completed work. Avoid wax or oil finishes which trap dirt and can darken the wood. Polyurethanes can go yellow with age. With all finishes you should experiment on scrap wood to see the final effect before using it on

your masterpiece. Always try to keep pyrographs out of direct sunlight or the burnt marks will fade and the wood will darken. An alternative to sealers is a protective sheet of acrylic plastic or glass. You will have to use a frame of some kind to keep the assembly together but these are readily obtainable.

OUTDOOR PYROGRAPHY

Technology has not yet devised the perfect outdoor clear varnish as any boat owner will tell you. Pyrographs which have to survive outside should be protected by the best outdoor varnish you can buy. Even so they may have to be re-varnished every couple of years or so. Pyrographs should be kept out of strong sunlight or the lighter marks will fade. Lines that are burnt really black will be reasonably fast to light but such things as house nameplates should be positioned out of the direct sun.

COLOURING PYROGRAPHY

Very pretty effects can be obtained using dyes or paint in combination with your pyrography. You can use artists water colours, coloured felt pens, opaque paint such as acrylic or wood stain which is transparent. The pyrographed lines tend to stop the colour from spreading or running. Use a proper artists sable brush to apply the colours and allow them to harden fully before applying the final finish. If the colours run along the grain while you are applying them it is likely that the wood you are using is too soft or coarse grained or you did not sand it smooth enough during the initial preparation. Coloured felt pens are easy to use but the

colours obtainable are rather harsh and you cannot dilute them down.

Whatever type of dye or paint you use you must make sure that it is compatible with the sealer or varnish you will eventually apply over the top. The tendency is for the varnish to dissolve the colour and spread it into unwanted areas. (you could try varnishing first and painting on top). You must experiment first on scrap material to check on compatibility.

Water colour paints and water-soluble wood stains will not be affected by the majority of varnishes but they will “raise the grain”. This means that they will swell the wood fibres and cause a rough surface. The way to avoid this is to deliberately raise the grain on the whole surface first, before you do any pyrography on it, by wiping with warm water. Wait for it to dry and then sand it down again using new sharp abrasive paper to remove any raised wood fibres.

Spirit (alcohol) based dyes give lovely colours and tend not to raise the grain. They can be obtained in concentrated form (see our woodturning supplies catalogue) and can be diluted with methylated spirit to give the required density of colour. They tend to be dissolved by Rustins coating but not by the water based acrylic spray. Ask for our mail order woodturning supplies catalogue for a wide range of finishes and colours.

HOW THE POINTS WORK

The nichrome point heats up when electric current is passed through it.

More heat is produced if the wire is thinner so thinning the tip is good and can be done by filing, hammering, or grinding. Thin down at the end only. Keep the “legs” thick to retain stiffness.

Bending or hammering the points is easier when mounted in the pencil and switched on because the metal is softer and more workable when red hot.

Wire gauges			
S.W.G.	Diam Inches	Diam mm	Metres/ ounce
26	0.018"	.457mm	20.4
25	0.020"	.508mm	16.5
24	0.022"	.559mm	13.6
23	0.024"	.609mm	11.4
S.W.G. = British Standard Wire Gauge			

IMPORTANT

Fuse wire, paperclips or any wire other than the special nichrome wire we supply must never be used or the power unit will burn out. We will charge for repairs to units damaged by overload.

Working at lower temperatures.

The pen is supplied with a tip which may burn too hot for your style of work even when the knob is turned down to the minimum heat setting. You should try a heavier standard loop made from 24 SWG wire which will be much cooler at minimum setting. Even better would be a 23 SWG loop bent back on itself as shown on page 6.

Bad connections. If the legs of the points are not clamped securely the point may refuse to heat up. Sparks, buzzing noises or one leg appearing to be hotter than the other are signs that the terminals need cleaning. Take the pencil terminals fully apart and clean off any tarry deposit to cure bad contacts. Caustic oven cleaner is ideal for this and will not attack the stainless steel. (It will attack your fingers and your clothes!) Keep oven cleaner away from any other component.

Avoid twisting and bending the flex at the end of the pencil or the strands of wire inside the insulation will eventually break. Do not wind the flex around the handle before storing the pencil.

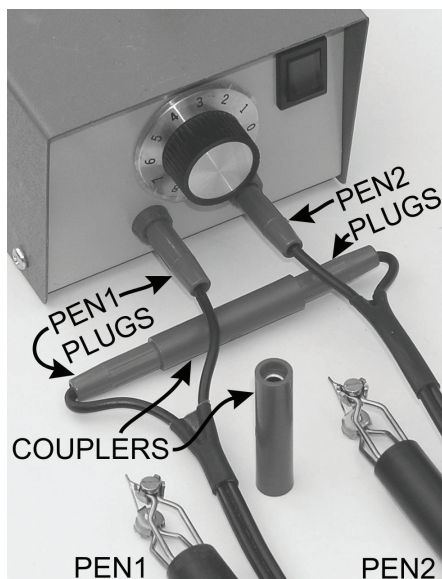
USEFUL TOOLS AND MATERIALS

- Small wire cutters, pointed nose pliers and small screwdriver.
- Small hammer and anvil for shaping and flattening points. The anvil can be improvised from a large hammer held in a vice.
- A scraper for removing mistakes. You might try a stanley knife blade. An alternative would be fine abrasive paper.
- A supply of abrasive paper for preparing the wood surface. Useful grades are 240, 320 and 400 grit.
- A supply of coarse wire wool for removing ash and tar build-up on the points.
- Sealer to seal your work against dirt. You can use a water based acrylic or cellulose sealer. The most durable is

the acrylic spray which can be obtained gloss or satin. When dry rub the sealer lightly with webrax abrasive nylon web to achieve a perfect finish.

USING TWO PENS SIMULTANEOUSLY

It is possible to have two pens running at the same time by joining them with a coupler as shown. The pens are electrically in series so the same current flows through both pens. As the power is shared between two pens only half power is delivered to each so the knob needs to be turned up, possibly to maximum output. The pens should have similar gauge nibs. If one pen has a finer point then that pen will glow hotter.



MORE INFORMATION

Books on pyrography.

“The Complete Pyrography” by Stephen Poole (published by GMC). Colourful, comprehensive guide to techniques with 12 projects described in detail. The ideal “advanced manual” for your Peter Child machine.

“Step by Step Pyrography” by Bob Neill. (GMC) The ideal beginners guide written in an easy to follow step by step style. Lots of projects to complete.

“Pyrography Designs” by Norma Gregory (GMC). Full of hundreds of useful designs of birds, mammals, flowers, herbs, farms and cottages and motifs such as Celtic knotwork.

“Pyrography” by Bob Neill (published by GMC). A great introduction to pyrography. This book introduces 18 simple step by step projects suitable for anyone interested in this popular and enjoyable craft.

For more information on pyrography machines, materials and accessories see www.craft-supplies.co.uk



Pyrography coasters courtesy of Bob Neill

Electrical Information

British Isles

The machine is supplied with a power cord or cable fitted with an IEC type G British 13A plug suitable for 220 to 250 volts A.C. mains operation, 50 to 60Hz. Power consumption is 30 watts.

If you change the plug use a three pin because the case of the machine **MUST BE EARTHED**. The fuse in the plug should have a 3 amp or preferably 1 amp rating.

Australia and New Zealand

The machine is supplied with an IEC Type I (three prong) plug suitable for 230 volts A.C. mains operation, 50Hz. Supplied with IEC lead, ready to use.

U.S.A

The machine is supplied with an IEC Type B (three prong) plug suitable for 110 volts A.C. mains operation, 60Hz. Supplied with IEC, lead ready to use.

Europe

The machine is supplied with an IEC Type C plug suitable for 230 volts A.C.

Pyrography accessories are available from your stockist.



mains operation, 50Hz. Supplied with IEC lead and ready to use.

Other regions

The machine is available in other regions some using the plugs outlined above.

Others including South Africa have opted to affix their own plugs.

Accessories

Description	Code
Pen	PYROOPEN
Spare Points – pack of 10	
Pack of 10 Spoon Points (24 SWG)	PYROSP10-24
Pack of 10 Standard Loops (25 SWG)	PYROSTLOOP10-25
Pack of 10 Fine Loops (26 SWG)	PYROFINELOOP10-26
Spare Points – pack of 5	
Pack of 5 Coil Points (23 SWG)	PYROCOIL5-23
Spare Wire – 1oz reel will make 150 points	
26SWG	PYRO26G1
25 SWG	PYRO25G1
24SWG	PYRO24G1
23SWG	PYRO23G1

See inside for more information on wire gauge and making your own points.



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