# Using photographs to make a Laser cutter/ etcher produce complex textures

The Laser cutter that the club has purchased is normally used with a drawing/diagram produced by a CAD package, requiring some familiarity with such software.

It has another mode of operation, whereby a photograph (in BMP) can be used for input. The Laser then reproduces the image by scanning the image completely and 'burning" a copy of the image into a piece of MDF. The use of Laser power for etching wood dates back at least 30 years to judge from the pencil holder sitting on my desk.

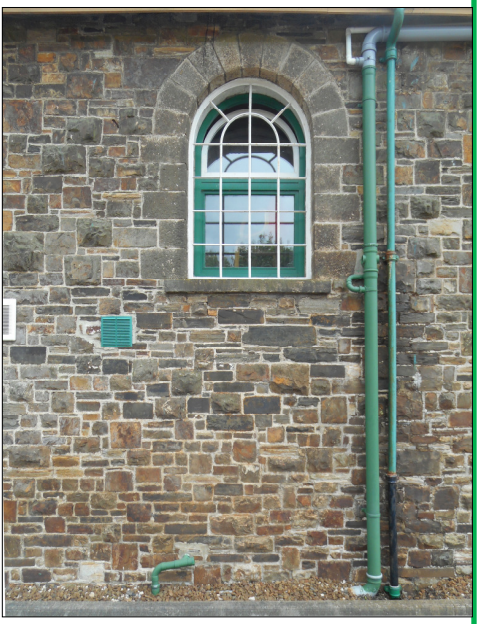
When I rashly offered to model the Goods Shed for the Okehampton project I little realised what I had let myself in for. This large building (now a Youth Hostel) was built out of local stonework (in 2 phases) which utilises a large variety of shapes and sizes of stone, and which also has a variety of colour shades. The stones are also irregular in that some project quite markedly from the vertical plane. The realistic representation of the surface therefore presents a number of challenges to the modeller. I knew from experience that an attempt to scribe the pattern of the stones accurately would be extremely difficult/impossible. Enter a 'Light Bulb' moment! Could I use the photographic etching facility to make some part of the construction easier!

**Photoshop to the rescue?**

I possess a copy of the software called Photoshop Elements (PSE for short) through participating in an Open University course on Digital Photography, but had not used more than a fraction of its features. (There is also an Open Source product called GIMP which is free – Photoshop costs a fair a bit to purchase a legal copy (£50 on offer compared with standard of £80 when I looked)). So I had another learning curve to experience, fortunately I found a guidebook (Photoshop Elements 8 for Windows) which I picked up in Oxfam for £2.99 and that has been essential to what I have been able to do so far.

I had taken some photos of the Goods shed when I looked round Okehampton a few years ago, but I soon realised they were not going to be good starting points. I had just 'snapped' away, without worrying about getting a consistent viewpoint for each image. A particular problem was caused by the deep set windows in the building, which affected the window image if not taken as square on as possible. Finding that Russ was about to visit the site, I asked him if he could take a consistent set of images of the shed walls – one window at a time and from square on to the window. Despite all the care in the world this was a hard ask, but Russ did a good job. You can see from the images that there is some distortion, and of course lots of overlap. Also, inevitably, since the building has a new purpose in life, there are some features which were not part of the original structure (YHA sign, a couple of fan mountings, some new plumbing – just the slim rainwater pipe from the gutter is original). The down pipes could be a useful disguise for joins in the etched results. So the first thing I set about was straightening out and squaring up the images, before trying to join them together. The first part can be done in PSE by use of cropping and transforming facilities. These allow a 'frame' to be attached to part of the image with 'handles' which can be used to rotate and skew the

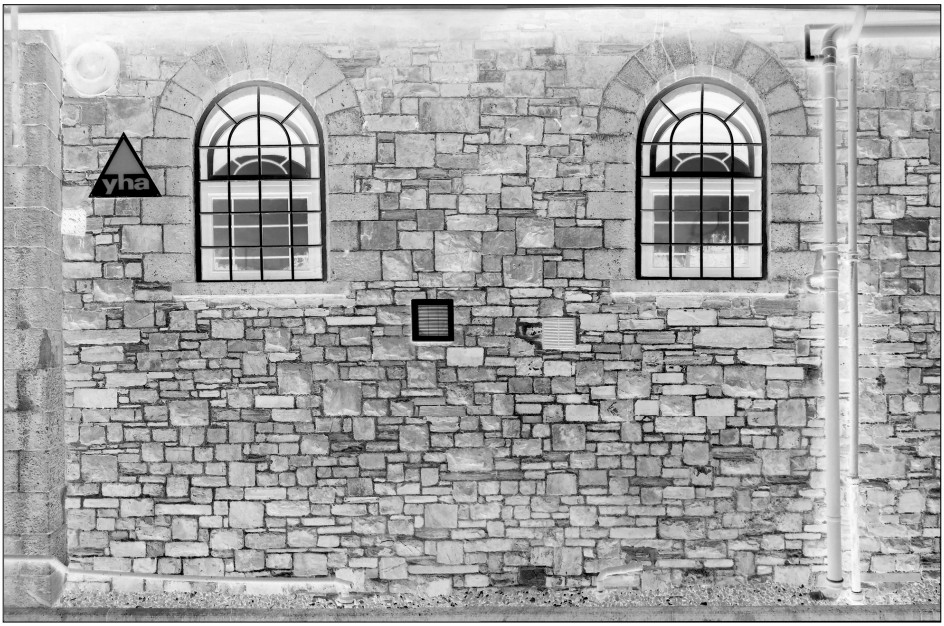
image until it looks much squarer. The second part is done by the 'panorama' command, which is specifically intended for making large images out of a series of overlapping ones. The amount of overlap has to be enough for the software to be able to match parts in each image and for it to make a seamless join. The result, after a lot of learning and trial and error, looked like this:-

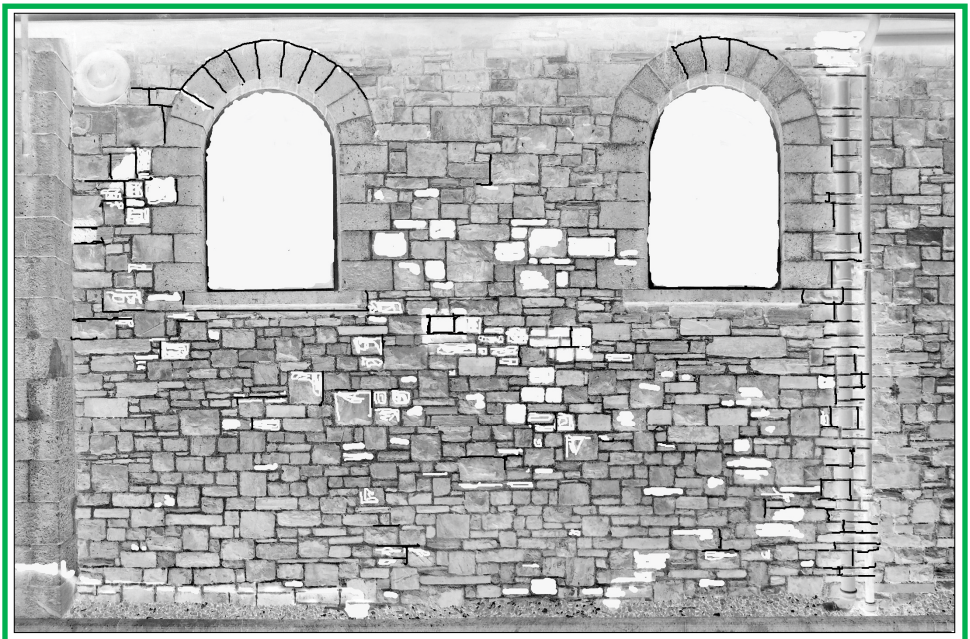
Can you spot the join? It's impressive. When I tried it by hand, you could see the overlap even after many attempts to improve it.

What's next to do? Well, we don't need colour for the laser etching process. What we want is an image where the mortar courses are cut for us, and the rest is left untouched. So we have to make a black and white image, and then make a negative version.

You can see the result:-




Looks promising? Well, we have to do a lot of work yet. Remove all the stuff that is modern. Then work on the image to lighten all those blocks which look dark, because we want those left light coloured – so will be unetched and can be painted by hand. There are two commands which can be used here – Clone, and Erase. The first copies a selected part of the image to another location. The second is more obvious. PSE allows the image to be blown up considerably so fine detail can be brushed in (or out). This is done using the mouse, which is not as easy as it sounds – it's very difficult to 'draw' a straight line with a mouse control.



So far, the best I have been able to achieve, looks like this. Some way to go yet, but we are looking at how much more needs to be done to get something which will stand up after painting. My art advisor is busy at the moment so that will have to wait. You can see the result on the Okehampton layout, where a pirated copy of part of the image has been pasted together to get a surface for the underside of the road bridge.

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