

IT MAY SEEM A PERVERSE CLAIM, BUT one of the most important pieces of software any 3D computer graphics artist needs is a 2D graphics package, particularly on a PC rather than a workstation. This is because 3D graphics running on a PC will only work comfortably if you are using relatively simple models.

By relatively simple, I mean scenes comprising perhaps 10 or 20 reasonably complex models. On a 16Mb Pentium system, for example, a furnished room with a few chairs, a table, some pictures and the odd piece of bric-a-brac will start to cause some serious disk thrashing and sluggish response times.

### The secret's in the textures

The answer to this problem is either to upgrade your machine to a workstation-class system (dream on), or to use simpler models more ingeniously (cheaper and more rewarding). The latter is done by concentrating your efforts less on models and more on the textures that you are going to drape over their surfaces. This is the reason for focusing on 2D graphics.

When an object is rendered, there are several features of its appearance that you can manipulate. For example, take a rectangular block, one of the simplest possible 3D objects that you can create. You can simply give it a colour, which will produce a rather dull picture of a coloured block. However, you can also apply a "texture map" to it, an image (or indeed, an animation or video sequence) which is painted over the image. This image can be applied once across the length of one side of the block, or "tiled" several times over its length. Thus you could put a photograph of someone on the face of the block to turn it into a rather chunky picture (or, if the image is an animation or video, the block could become a TV set). Or you could apply a picture of a brick and tile it over the rectangle to create a brick wall. All of this will have been done using the

same, simple object.

You can get more ambitious and apply a bump map as well as a texture map. Bump maps use the level of light of each individual pixel in the map image to determine how much the surface of the object sticks out. For example, you could give the brick wall a rough surface by applying a speckly image to it as a bump map. The bright speckles will produce bumps, the dark specks, pits. The higher the contrast level of the bump map image, the rougher the surface will look when the model is rendered.

All the 3D packages I have encountered come with a supply of images to use as texture and bump maps, normally stored on CD-ROM. They are generally delivered in standard image file formats, so they can be edited using a standard paint program. It is exploiting this capability that is, I think, the key to successful 3D work on a PC.

### Turning professional

There are several paint programs available,

many of them good. You even get one free with Windows, which is perfectly adequate for simple tasks. However, for really successful work, it is worth investing in one of the more professional packages.

The CorelDraw suite is probably the best known. It is cheap and quite powerful. I have been a user for some years (drawn by the price), but find the software lacks polish. Even with version 4 I was still encountering bugs, so I never bothered to upgrade to 5 or 6. Perhaps they are better.

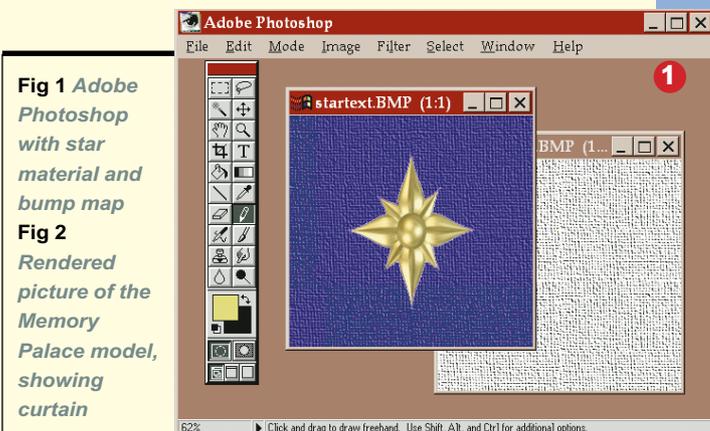
Two alternatives I have been trying recently are the latest versions of Adobe Photoshop (3.0.5, which runs very nicely under Windows 95) and Fractal Design Painter (version 4). Fig 1 shows the texture and bump maps created for a curtain using Photoshop. The curtain is used in a structure being developed for my "Memory Palace" project (Fig 2).

Creating these textures took a lot of effort, but I think it was worthwhile. First, I needed a picture of an ornamental star. I



## On the face of it

**If your hardware won't allow you to create complex modelling, one way is to focus on textures in 2D. Paint packages can help, says Benjamin Woolley.**



**Fig 1** Adobe Photoshop with star material and bump map  
**Fig 2** Rendered picture of the Memory Palace model, showing curtain



## 3D packages: the art of seduction

People get very attached to their 3D packages. This is natural, as they have to spend so much time getting to know them. I apparently upset some veteran users of Newtek's Lightwave with my remarks about the package in the April column, so I have decided to try it out over the coming weeks. But I know already that after the first few hours I am likely to be seduced. Familiarity breeds devotion in this business.

I have found this to be particularly true with the 32-bit Windows packages Truespace (from Caligari) and Extreme 3D (from Macromedia). My loyalties have been flipping between these two ever since I started using them, and I still do not know which I favour (so, in true liberal fashion, I suppose I shall have to say I favour both).

Truespace has been around on the PC platform for longer (it is now in version 2) and its relative maturity shows. Extreme 3D, which is brand new, crashed a couple of times on my Compaq, though fortunately with frequent saving I managed not to lose anything vital. It also lacks support for all but one or two 3D and 2D file formats. Among other things, this effectively prevented me from using the Alpha channel in the creation of the curtain fabric (the Alpha channel is used to determine the transparency of each pixel in an image, so can be used to layer textures over the top of each other).

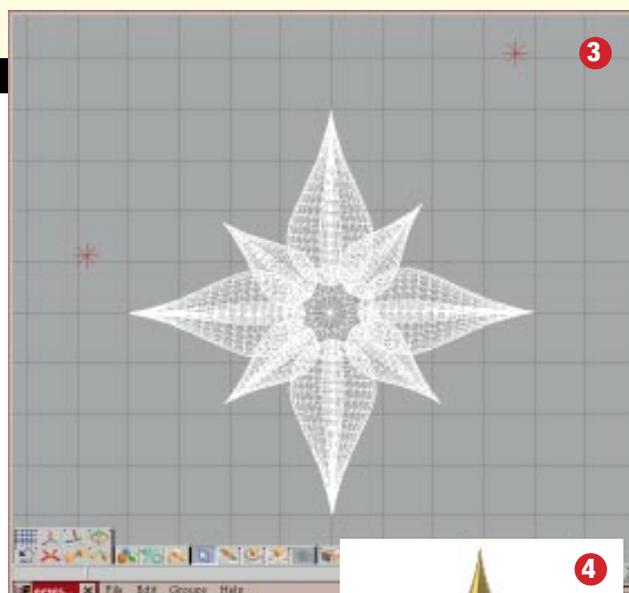
Such a serious omission is surprising in a package that is in other respects so well specified. Its texture-handling capabilities are extensive. There is network rendering (over mixed Mac and PC networks). It provides excellent realtime sketch rendering (just about the best in the business, I would say). It also offers full Bezier spline-based modelling, which is wonderful to use. The Bezier bit means you can edit curves with great precision and ease using "control handles".

Truespace also has splines, but it is in many other respects more basic than Extreme 3D, and this is reflected in the price. On the street it is well under £400 (at the time of going to press, Extreme 3D had a recommended retail price of £525). The documentation, in particular, is on the sparse side. However, simplicity has its merits. Truespace has most of what you need while remaining simple and straightforward. The most important tools are there, and all are a joy to use: intuitive, nicely organised, easy to access. Truespace also supports a vast array of file formats and makes a pretty good fist of translating them into its own.

Whichever is the better, both demonstrate at least one thing that relates to the first half of this month's column: the demands that 3D makes on the system. You cannot realistically run either package on a system with less than 16Mb. A Pentium is essential, as is a 24-bit graphics card and either a gigabyte of disk space or a removable disk (not for the programs, but for the vast array of files you will generate using them).

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**Fig 3** Star model, displayed using Truespace 2 and ready for rendering



**Fig 4** Rendered image of the star model

applied and sketch-rendered using Extreme 3D (of which more, left).

Photoshop is excellent for editing and manipulating existing images. If you can't afford it, PaintShop Pro version 3, which is distributed as shareware, is a good substitute. To create images from scratch, however, it is also worth considering Fractal Design's new Painter 4, which seems to be particularly good at creating various architectural effects such as mosaics and "tessellations" (good for stained glass). I'm still experimenting, but I have found it enormous fun. One criticism: some bright spark thought it would be entertaining to package the CD and manuals in a paint tin. This gives you a moment's amusement when you open it up, and hours of frustration as you try

to fit everything back in again.

**Fig 5** Extreme 3D, showing curtain with material applied. The grid next to it is the working plane used to draw profiles for 3D models



decided to model one from scratch (Fig 3) and render the picture from that (Fig 4). I imported the picture into Photoshop and created a background of plain blue, which I gave a fabric texture using one of the plugins that are used to apply effects to images. This one was available from Adobe's new Gallery Effects range. I used the same

Gallery Effect to create a fabric bump map (the underlapping window in Fig 1). This is in mono, because the size of bumps is determined by the brightness of each pixel rather than its colour (helps keep the size of the file down, which helps reduce rendering times later). You can see the preliminary results of using this material in Fig 5,

to fit everything back in again.

## PCW Contacts

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