# Clowning around

**3D animation with Caligari's trueSpace, devised and directed by Geoff Bains.**

Although you're unlikely to produce a serious rival to *Toy Story* on your PC, Caligari's TrueSpace2, which is included on *PCW's* cover-mounted CD this month, will still be able to produce some startlingly animated models.

Whether you're the artistic type, flinching at all the wireframes and co-ordinate axes ('why can't it be as simple as just drawing on paper?'), or the techie, who knows perfectly well what the formula for a parabola is but had no idea that an animated bouncing ball used it, you'll be well qualified.

### Making the first move

We're going to produce a one-second animation of a reasonably realistic wobbling clown toy, sitting on the inevitable chequered floor, viewed by a berserk bluefly circumnavigating the oscillating plaything.

OK, so it's a long way from Pixar's *Toy Story*, but it will introduce many of the techniques used and should take you about 40 minutes to produce — most of which is rendering time, during which you can go and make an urn of tea.

**The basic plan** is to build up a model of the clown from 'primitive' shapes, define the type and colour of its surfaces, and then tell the PC how the clown is to move and how the 'camera' is to move around it. The PC can then generate each frame of the final movie.

TrueSpace's opening screen gives a perspective view of a grid. This isn't our floor, it's just a ground plane to work on and doesn't appear in the final animation.

### Button it!

Open the Primitives panel from the buttons along the base (it takes a while to learn what's what, but each one is labelled when the cursor is over it) and select the Add plane. This deposits a flat, square object on the grid — this is the beginnings of our floor.

You need to enlarge this, but first go to the New View button, hold down the left mouse button and, from the pop-up menu, select a New Top View and then a New Front View. These produce small windows showing the scene from the top (so far, a square) and front (a line). It helps to have a fairly high-resolution screen for TrueSpace because you'll end up with lots of windows.

**The contents of the main view** and the windows can be homed-in on by clicking their respective Zoom buttons at the extreme right and then rolling the mouse up and down the screen while holding the left button — try it! Similarly, you can move the views within their windows with the Eye Move button. Set up all three views so you can see a reasonable proportion of the base grid.

Now you can change the floor size by selecting the Object Scale button and, with both mouse buttons pressed, roll the cursor up the screen until the square is a good size. (Both buttons scale the square in both directions at once. Try just the left button and see what happens, then Ctrl-Z to cancel it.) You can then move the floor to a suitable position with the Object Move button.

**Now let's colour it.** Click the Paint Face button to open all the rendering panels. Choose a colour and brightness from the cube and set Ambient Glow and Shininess to about a third, Roughness to a half, and Transparency and Refractive Index to zero.

Click the buttons for Phong Shading, Smooth and Use Texture Map (select the chequer pattern with the Texture Map panel by clicking the right mouse button if it's not already there). Click the Paint Object button from the Paint Face pop-up menu and choose Render Scene from the Render button menu to see the result.

**You can play with** all the colour and surface parameters to get different materials and appearances for the floor, rendering the object or scene each time to see the effect. When you're satisfied, save the whole scene (under the File menu) and keep doing this at regular intervals to protect your work.

*It helps to have a fairly high-resolution screen for TrueSpace 2 as you'll end up with a lot of windows*

### Picking up the pieces

Now for the wobbly toy. From the Primitives panel, select a sphere and set the latitude and longitude steps to about 30 (to make it reasonably smooth).

Create three more spheres and scale each to suitable sizes for the body, head and two eyes. Similarly, create a cylinder for the nose. In the same way as the floor, render each to look like plastic (don't use the Texture Map here) in a suitable colour.

Now the spheres have to be moved and rotated (Object Rotate) relative to one another to make the clown. Do this in the Top and Front View windows: try it in the Perspective View, and the bits end up all over the shop!

Because these objects have non-transparent surfaces, where the eye-spheres intersect the head-sphere, they will appear as half-spheres stuck on the surface. Similarly, the nose can be inserted into the head for a smooth join. Render the scene as often as you can to check it's all right.

Because the clown has been 'built' in the Front and Top View windows, it has probably not finished up where you want it — on the floor. To move it now (and later, when we come to animate the wobble) we need to group all the pieces together. This is done with the Glue As Child button — click the button and then touch each of the clown elements with the glue-stick cursor. The whole clown can now be treated as one object.

**At this point,** select the complete clown and rotate and move it to a suitable position just touching the floor with Object Move. Now we want to move the point of origin of the axis of rotation for the whole clown to the floor, from where

he'll wobble. Select the clown and click the Axes button to display the object's axes, then, in the window views, with Object Move, shift the axes origin to the floor. Render the scene again to check the overall effect.

### A moving experience

Right, let's wobble. Close All Panels and open Animation Tool and Animation Project Window. In the Project window you'll see lines for the objects in the scene — the plane (floor), default lights and NoName (the wobbly clown). Make sure NoName is selected and in the Animation Tool panel, click the Record button.

Follow this procedure to Record one complete wobble of the clown: change the frame counter to 20; tilt the clown about 45 degrees; click Record; counter to 40; straighten clown; click Record; counter to 60; tilt clown the same amount in the opposite direction; click Record; counter to 80; straighten clown; click Record.

**Press the Play button** to see the animation you've created. The software fills in all the positions in the 19 intermediate frames between your Record points, tilting the clown an even amount each frame. The wireframe clown in each view should rock back and forth once. You can speed up or slow down the animation by dragging the right-hand end of the bar in the Project window, stretching or compressing it.

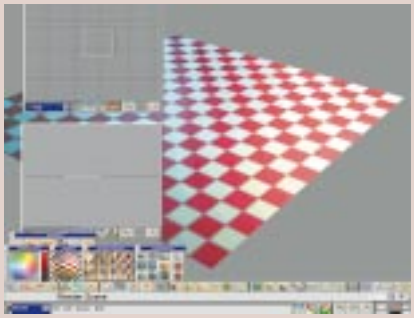
Now press the Repeat Action button in the Project panel and click on the NoName row. This repeats the animation (the wobble) throughout the movie sequence. Press the Play button to see the effect (slowly).

### Choose your shot

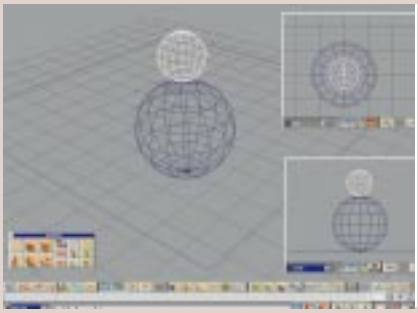
Now for the camera. In the Primitives panel, select the camera, and when it appears, position it (Object Move) a suitable distance from the clown. Press the Look At button, and then click the cursor over the clown to keep the camera pointed at it wherever it goes. Change the main view to the camera's view to get a good position for it.

To move the camera around, we draw a path for it to follow. Select the Path button and set the segments to 20 (20 frames between each plotted position on the path). Draw a route for the camera in the Top View window with

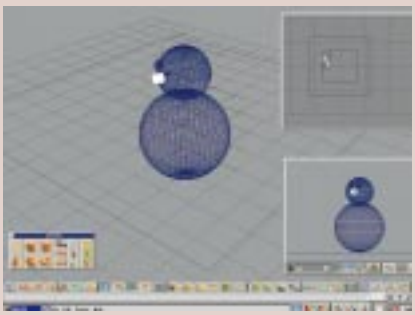
## TrueSpace 2: the movie — a frame-by-frame guide



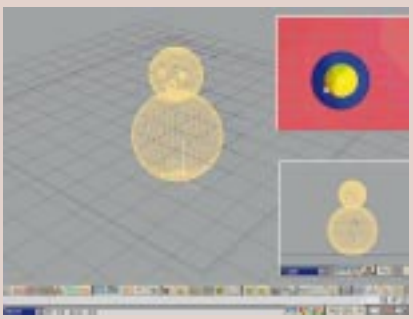
**1** The finished floor, rendered in all its vinyl tile glory



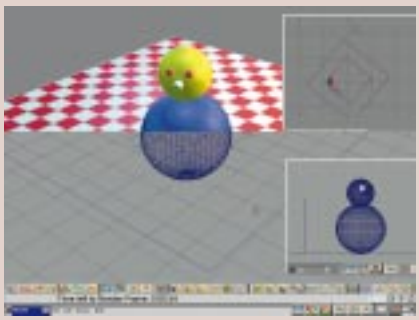
**2** Building up the clown object from the sphere Primitives



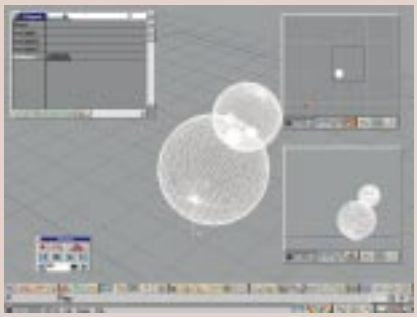
**3** Positioning the nose cylinder accurately in the Top View window



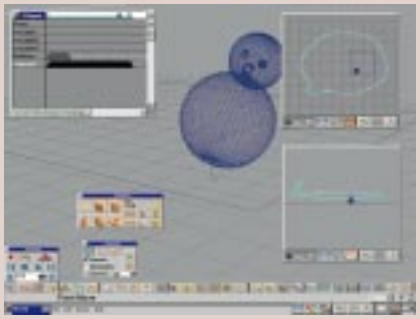
**4** Moving the whole clown's axes origin to the base for the wobble



**5** Rendering the scene to check the pre-animation setup

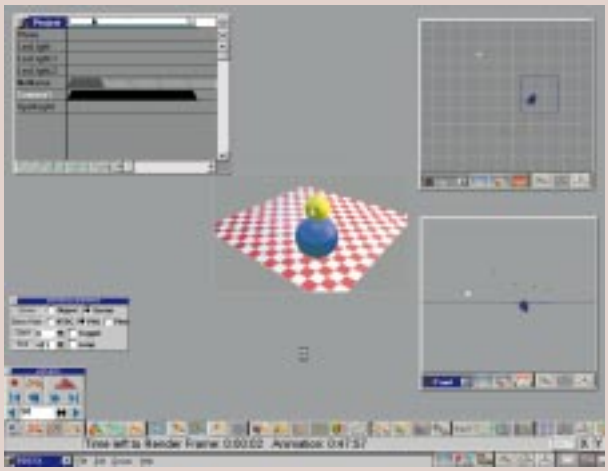


**6** Playing back the wobble animation



**7** Editing the camera's flight path around the clown

**8** Preparing to render the whole movie



**9** Frame-by-frame movie rendering in progress

**10** The finished movie playing in Microsoft ActiveMovie

about 18 positions plotted around the clown (a right click closes the path). This can then be tilted (Object Rotate), enlarged and reduced (Object Scale) or edited a point at a time (Point Move) to get the desired route.

**You can check the effect** by pressing Play in the Animation panel and watching the camera's changing view as it moves along the path around the clown. In the Animation Parameters panel (right click the Play button) change from Draw Object to Draw Scene. You can now preview the whole animation (moving camera *and* wobbling clown) or render the complete sequence to make an AVI file.

***Put in time practising and you could yet be giving Pixar a run for its money***

We're almost finished now. But before you start the movie-rendering process, you may want to think about lighting. Three default lights are already provided, but a spotlight or two adds dramatic effect. These are selected from the Primitives panel and adjusted with the Object Move, Rotate and Scale buttons and the mouse.

The brightness, colour, shadows and fall-off rate of the light are controlled from the Lights Control panel that comes up whenever a light is selected. You can switch on shadows for a bit of realism, but be aware that this dramatically increases the rendering time too. It's probably best to leave out shadows for this first attempt.

### Action!

To finally create your movie, select the Dialogue box from the Render Scene To File from the Render button, enter a suitable name for your movie and select the AVI format All Frames for your animation, a preset size of 320 x 200 (larger image sizes are prettier but take too long to render for this initial trial), 25 frames a second, and leave all the effects off.

Press Render, choose the Cinepak Codec and a compression quality of about 85 percent, press OK, sit back and be prepared to wait. Each frame of the movie is rendered on-screen and the estimated time remaining to complete the movie is given.

If you change your mind during the rendering process — you might suddenly remember a forgotten task, or see a frame that's not what you want — you can abort it with the Escape key.

**Once the file is created** you can watch it on any AVI player such as the Windows Media Player (in Multimedia, in Accessories) and, size permitting, send it to a friend. That could be the end of the matter, but you'll probably now want to go back to TrueSpace and start making a few adjustments.

You can make the animation more realistic in a number of ways. First add those shadows, particularly from the spotlight. You should also change your initial wobble animation so that as the clown tilts, it's also raised a little so that it doesn't sink through the floor (it's barely noticeable, but it does spoil the effect a little). You could also change the clown's animation so it moves faster at the centre of the wobble and slower when fully tilted, by increasing the number of steps.

### It's more fun with two

A second animated object is fun — a bouncing ball is simple to arrange. Try to get the speed of movement right, slowing at the top of its ascent, and even add a bit of a squash to the sphere as it lands: you can Object Scale the ball with the right mouse button only pressed, to alter just its vertical dimensions.

More lights can add to the realism, and experimenting with the rendering surfaces of objects is quite compulsive — try a metallic clown and use Ray Tracing (from the Render Options panel — right click on the Render button) for some really nice effects. But be prepared for hours of rendering.

Put in sufficient time experimenting with the near-endless possibilities of the software, and you could yet be giving Pixar a run for its money.

**PCW CONTACTS**

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