A fter I had first read the ArtWorks Manual I felt rather disappointed: "Is that all there is to it, then?" But I very soon realised that here was a program of great power hidden behind an innocent-looking user interface. However, deciding how to put this power to use in order to draw a particular feature can take a little while: this article shows how layers, conversion into shapes, joining shapes, breaking lines, etc. can be used, in the hope that this will break any mental log-jams in these areas!

One of the first jobs for which I wanted to use ArtWorks was to draw a map (actually 'tracing' from a scanned image); the map had contour lines and I wanted to use shades of grey to indicate the various height ranges as in an atlas. Drawing a map was not new: I had often done this before, using Draw and Draw Plus but, luckily, had never had to do this type of shading. The problem is that two contiguous areas of shading need two identical boundaries on their common border: not too easy before ArtWorks.

LAYERS
I followed my usual practice of putting the scanned image on the lowest layer, and then drawing the various geographical features on suitably named layers. I have to confess that I did this in the blithe belief that I would be able, later, to do my shading. Luckily, my faith in ArtWorks was justified!

If you have trouble in imagining what a layer is, try thinking of it as a sheet of glass that you draw on; you can draw a different type of feature on each sheet (e.g. roads, rivers, railways). When you have drawn all the features, you stack the sheets of glass together and then you can see the whole map. If you later need a map just of railways you can take out the

Using ArtWorks

Peter Bond discusses his first experiences in using Computer Concepts ArtWorks.

other sheets. Indeed, it is just because some maps and engineering drawings are drawn rather like this that layers are so called! In ArtWorks, objects on the non-current layers cannot be selected (unless you select Multilayer), and as many layers as you like can be made invisible; you will see that this sort of facility makes it much
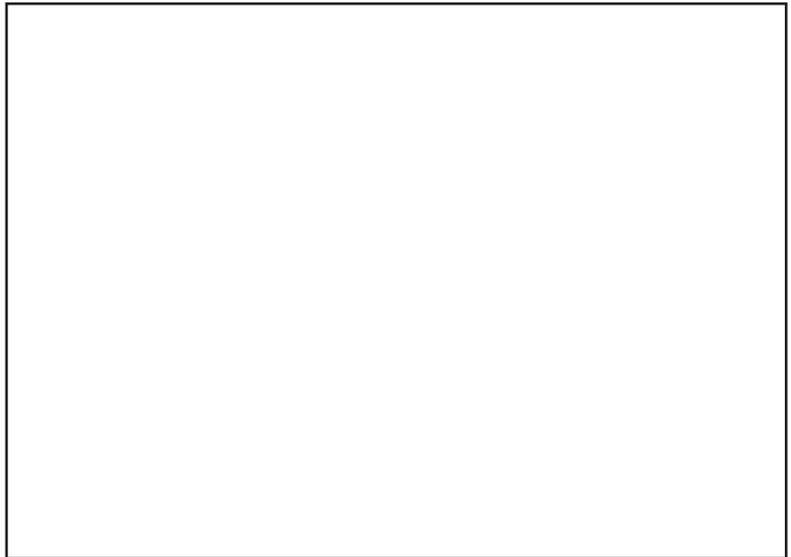

Original map

easier to manipulate complex drawings.

SHADING
Back to my map: figure 1 shows a simplified version with just a land border, rivers and contours. For simplicity I have put all features on the lowest (foreground) layer. The contours represent heights of 50m, 100m and 150m; I shall shade the four areas deeper shades of grey, with white for the lowest (obviously, I don't

have to do anything about that). Let's start with the land above 150m as it is the simplest:

1. Create a new layer called, say, Shading_1.

2. Reset Foreground to be the current layer.

3. Select the rectangle boundary and the 150m contour.

4. Clone these two objects (menu or Ctrl-K): this creates identical c o p i e s superimposed on the originals.

5. Cut the objects (menu or Ctrl-X).

6. Change to the Shading_1 layer and perform what I call exact paste - i.e. paste

First shaded contour
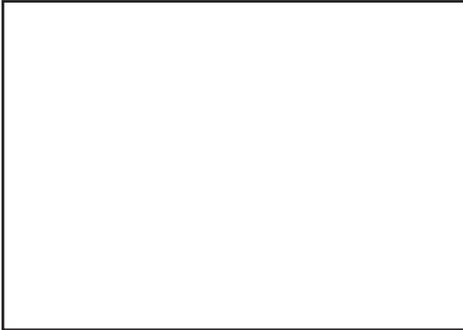
Third shaded

the objects (menu or Ctrl-V) with the Shift key held down: this means that objects are pasted with their original X-Y positions, and it is vital to this operation (although it is explained in the manual that this is how to move objects exactly between layers, it is well away from the discussion on layers).

7. At this stage you will see nothing different, but what we have is a copy of the surrounding rectangle and the 150m contour in the new layer.

8. Go to the layer menu and edit Foreground to make it invisible (keeping Shading_1 as current layer).

9. Select the rectangle and make it a shape (via Lines/Shapes & Make shapes menu items): the significance of this is that the object has now lost its rectangleness ; it is just an object made of 4 straight lines and can be manipulated as you like.

10. Now (while the ex-rectangle is still selected) pick the Path Editing tool and click on one of the sides just where the contour intersects it (zoom to do this fairly accurately).

11. Click on the Break line icon.

12. Repeat for the other intersection: the result of this is that the ex-rectangle is now in two distinct sections.

13. Pick the Select tool again and click on the top-right corner of the rectangle: you will see that the bottom left-hand corner is not in the selection.

14. Delete the selection - the top-right section.

We now have three lines which have to be made into a shape: the two straight lines are already joined at the bottom left, the other two connections still have to be made:

15. Zoom into one of the junctions, select the contour, pick Path editing , and drag the end of the contour to the end of the straight line (it will snap in when it is close enough).

16. Repeat for the other junction: you will probably find that when you make the second junction, the contour will make a smooth curve with the border line - which is not wanted! When this happens, click on Undo, click on the Sharp corner icon and then repeat the drag to close the shape.

17. Finally, use the Flat fill tool to fill the shape with an appropriate shade (such as 30% black) and to make the line colour None so that the contour line is not visible (which is my preference).

Figure 2 shows the current situation with layer Foreground still invisible.

It is, I hope, fairly obvious how to shade another area of ground: make Shading_1 invisible; create another layer, Shading_2 perhaps; make Foreground visible; select all the objects that form any part of the boundary of the area to be shaded; clone them; move the clones to the new layer; make Foreground invisible; go to the new

layer and, just as described above, discard the parts of the objects that will not be used and join up the remainder. The result for the ground between 50m and 100m is shown in figure 3. This was a little more complex than the first area as the bounding rectangle had to produce two segments, and part of the land border was also needed.

There is usually no need to keep the shadings separate, and I would now move this last area into Shading_1 (using Cut and Exact Paste) and re-use Shading_2 for the next area between 100m and 150m.

The final map is shown in figure 4 with all three shading areas combined into one layer, which is put at the bottom of the stack (as otherwise all the map detail would be covered), and with the original contour lines deleted as they are no longer needed (if one were to want them again, they could be reconstructed from the shadings).

HATCHING

Another method of filling shapes is to hatch them, and I was disappointed not to find hatching in ArtWorks. Although to be fair, it is a technique more likely to be found in engineering drawing programs. However, it can still be done in ArtWorks as shown in figure 5. In fact, this is just one instance of a much more general technique: that of making a window onto an underlying scene just as in Computer Concept's desert scene with palm trees which is viewed through the letters of "Works". Proceed as follows:

1. draw the shape to be hatched (or use an existing shape such as a letter);

2. make a hatching pattern rather larger than the shape (I made the hatching in the example by drawing vertical lines on either side of the shape to be hatched, using blend to fill the space with 12 lines, duplicating this construct, rotating one to 30″, and the

other to -30″, and finally grouping them together);

3. draw a shape larger than the hatching (if you use a rectangle or a circle, convert it to a shape);

4. select the shape to be hatched, clone it, select also the surrounding shape,
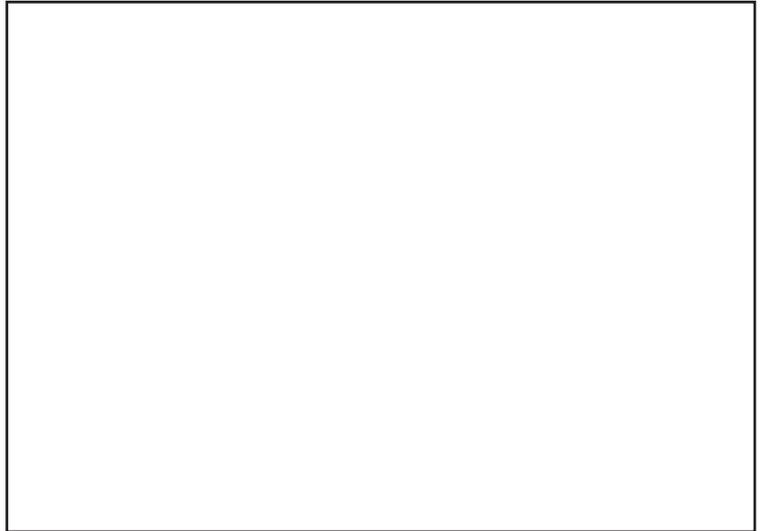
Final shaded contour map

join the two into one shape;

5. change the fill colour to white, and the line colour to none.

The point of the last two steps is to make the outline of the surrounding shape invisible while still leaving a visible line around the hatching area (it also corrects the stacking order). If the surrounding area can be made large enough for its bounding line to be out of the printing area then the cloning step can be left out and the line colour left as black (or whatever). What you cannot do with this technique is to hatch two or more adjacent areas - if I am wrong about this, please tell me because I want to know!

A point about invisible layers is that ArtWorks does not, by default,
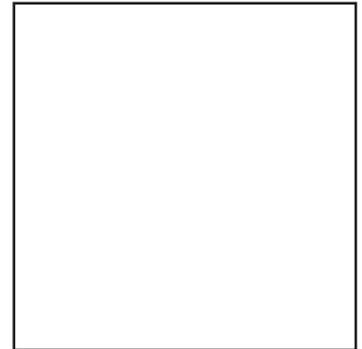
Cross hatching

print them. However, they are exported in Draw file format and this means that, at the time of writing, if you want to print an ArtWorks drawing in Impression and it contains an invisible layer then that layer must be deleted before the export.

TILING

I had a certain amount of trouble when I tried the tiling facility with printing - this was mainly because I had not read the manual sufficiently! Having decided that you want to tile, go to the Print dialogue box; click on Tiling and
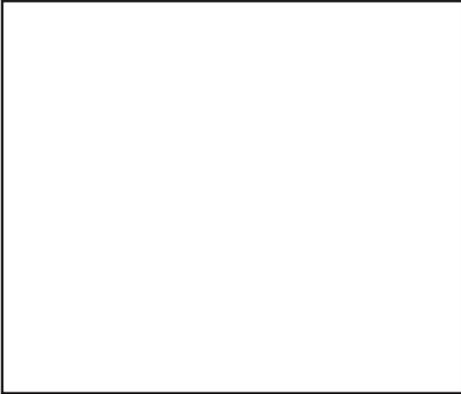
caption

and on the appropriate orientation icon. It is now important to click on the Set values icon down at the bottom. When you go back to your drawing you will see the red lines that show how the tiles are arranged on your drawing board. The manual does not tell you how much extra is taken by cut marks etc., but now you can measure the size of a printed page (just draw a line and look at its co-ordinates: Shift/F1) and, if you want, reduce the size of your drawing board to avoid having tiles with only a fraction of a drawing on them.

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