

# ST FORMAT

**FREE  
SUPPLEMENT!**

# SOUND & VISION

NO ST MAGAZINE GIVES YOU MORE FOR YOUR MONEY!

## Your complete guide to getting started in **CANVAS**



The complete graphics package:  
*nothing* has been taken out!

- Step-by-step guides to creating stunning masterpieces of your own
- Construct 3D shapes and import them into your pictures
- Create pictures with a whacking great 4,096 colours

**PLUS! TURN THIS SUPPLEMENT OVER FOR YOUR GUIDE TO SEQUENCER ONE**



Rip the second disk off this month's cover of *ST FORMAT* and pop it into your disk drive. *Canvas* won't run from a folder so you need to copy it to a freshly-formatted disk. Locate the *Canvas* files by double-clicking on the SIDE\_2 folder. Now have a blank disk ready and select all the files in the CANVAS folder and drag them to the Drive B icon to copy them to your blank disk. When the copying has finished, double-click on the file called CANVAS.PRГ and get ready to create some graphical masterpieces. *Canvas* runs in all three resolutions.

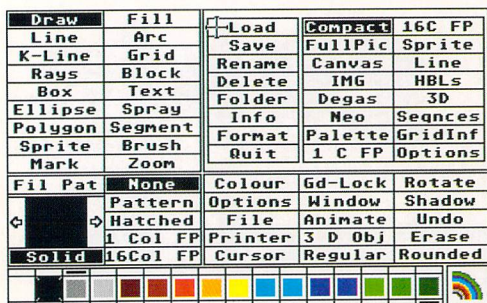
*Canvas* is a huge program with many powerful facilities which you can get to grips with very quickly. If you want to make the most of this versatile art package then follow these ten steps – they'll guide you through some of the program's more interesting features without bogging you down in technical detail.

# Your guide

*Canvas* is the most versatile art package you can buy – so what better

we're giving it away to readers of *ST FORMAT*. Follow in the footsteps of Van

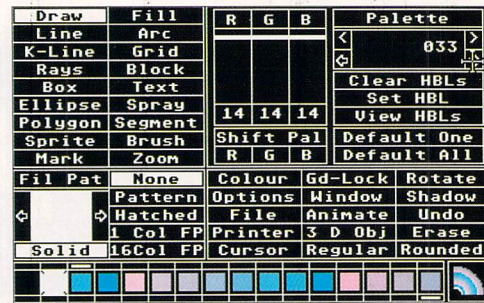
Then enter our competition and discover something Van Gogh never knew –



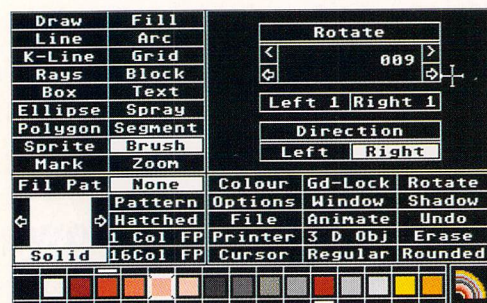
**1** Once the program has loaded you're presented with a packed main menu screen. Move the mouse to the "File" option in the middle of the menu screen and click. The top right-hand corner of the screen (called the Options box from now on) changes, showing several new options. Make sure the word "Compact" is selected, then click on "Load" to bring up the fileselector. Find the file called F\_GTO.CPT in the \_PICTURES folder and double click on it to load it into *Canvas*.



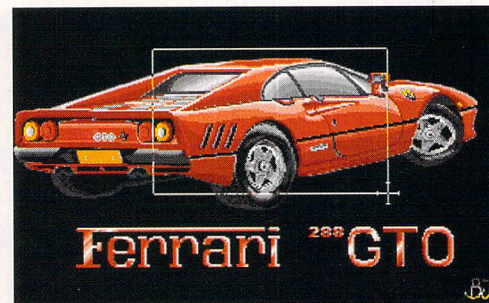
**2** Now press the right mouse button to see the picture. The right button is used to flip between the menu screen and the workscreen where you do all your drawing. Try scribbling all over the picture by holding down the left mouse button and moving the mouse. Now press <Undo> to get rid of your scrawling. An alert box appears asking if you really want to Undo. Click on "Yes" and the scribbles disappear. The Undo option erases everything you've drawn since you last entered the workscreen. Click the right mouse button to return to the menu.



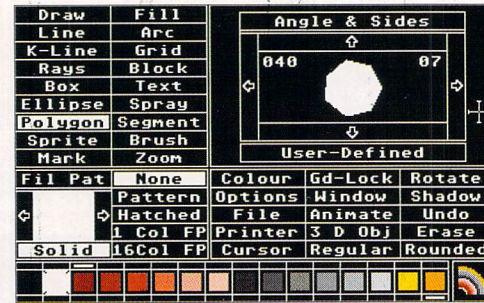
**3** Now select "Colour" (the "Options" box changes again). In the top right of this box is an option called "Palette" with some arrows surrounding it. Click on the left- or right-pointing lower arrows to step through the 64 preset palettes of the program. Note the row of colours across the bottom of the screen changes each time. To see the effect they have on the picture, have a look at the workscreen by hitting the right mouse button.



**6** Now click on the "Rotate" button. As you might have guessed, this enables you to cycle a range of colours within the palette for a psychedelic effect. The range of colours selected can be seen in the colour selector. Each colour has a space above and below it. Simply click on these spaces to set the start and end limits for rotation: the first colour has the marker set above it and the last colour has it set below. Change the speed of rotation by clicking on the left and right lower arrows around the "Rotate" box in the Options box, and change the direction by clicking on Left or Right. Mess about with various rotations and see what effect they have on the picture. When you've finished, reset the rotation speed to 0 by clicking on the upper left-hand arrow.



**7** If your picture is looking messy, reload it by clicking on "File," then on "Load" and select F\_GTO.CPT. Click on "Block." Use block effects to transform bits of your picture in wonderful ways. Ensure "Copy" is highlighted in the Options box (click on it if it's not). Go to the workscreen and select a box around part of the picture. Click once to set the top left corner of the box and click again to set the bottom right corner. Click the right button twice. From the menu, select "Options" and "H-Wrink." Return to the workscreen and the block you've just copied appears on your cursor. Move it to a suitable position and click. An outline appears which moves with the mouse. When this is in the right place, click to see a horizontal "wrinkle" in the block. Try the other options in the "Block" box. If you reach an unfamiliar part, don't panic – just click on "Block" again.



**8** Now click on "Erase" to clear the whole screen. Select "Shadow" (you can guess what this does) and choose one of the displayed directions and colours from the Options box. You can also change the "Distance" if you like. Next select "Polygon." Clicking on the left/right arrows changes the angle of the displayed polygon, and clicking the up/down ones changes the number of sides (from three to 20). The numbers in the polygon box show these figures respectively.

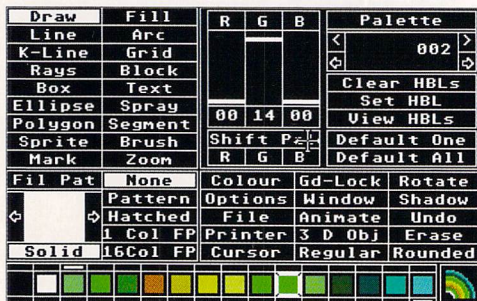
Now go to the workscreen and click somewhere. Move the mouse and an outline of your polygon appears, which can be stretched and twisted. When the outline is to your satisfaction, click again to set the polygon, and it should appear, shadow and all. If you only want to change the size and not the shape of the polygon, return to the main menu and select "Regular" before re-plotting.



# to Canvas

Christmas present for you. Now  
Gogh with our eye-opening guides.  
fabulous wealth (well, almost)

EXCLUSIVE  
TO THE  
JANUARY ISSUE  
OF ST FORMAT



**4** If you want to change a single colour simply click on it in the row of colours at the bottom of the screen. Drag the RGB sliders in the "Options" box to change the Red, Green and Blue content of the colour. There are 15 levels of each shade in these sliders. On STEs all 15 levels are active. On standard STs you have to move the sliders two steps to see any change. Click on "Shift Pal" just below the sliders and watch the effect. This shifts the entire palette one shade closer to the currently selected colour. To shift just the Red, Green or Blue portions of the palette, click on the R, G or B buttons below "Shift Pal." To restore all the colours to their original values click on "Default All" to the right of the "Options" box.



**9** Turn "Shadow" off by clicking "Off" in the "Options" box. Change the markers on the colour selector so that the entire palette is selected. Then select the "Rainbow" icon (bottom right of the screen) and click on "Spray." Alter the size and rate if you like (nine is the fastest rate) and return to the workscreen. Spray away – instant multi-coloured spray.



**5** Make sure the number in the "Palette" box is set to 0 by clicking on the left-facing UPPER arrow. Now select "Brush" from the main menu and a colour from the selector along the bottom. Mess around with "Size" as well if you want to make your brush bigger or smaller. "Brush" enables you to draw with a thick box rather than a line – give it a go. Return to the main menu and click on "Smear" in the "Options" box, then return to the drawing and see the difference this makes ("Size" must be set larger than a single dot for this to work). For smoother lines, click on "Draw" in the menu and repeat the process. Change the line thickness by clicking on the arrows around the "Size" box in the "Options" box. Experiment with the other buttons in "Options" box.

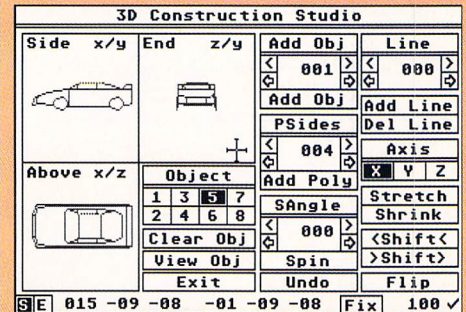


**10** Finally, return to the "File" menu. Click on "Load" and a fileselector appears – choose the file called SUNSET.CPT in the \_HBLs folder. Have a quick look at the piccy and then click on "File" to bring up an options box and click on HBLs (to the right). Click on "Load" and select the file SUNSET.HBL, also in the \_HBLs folder. Now look at the picture again. Nothing's happened – yet.

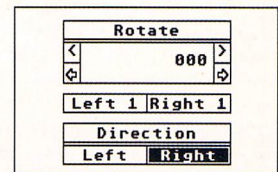
Select "Colour" and make sure palette 0 is selected. Click on "View HBLs" and the picture appears again, but this time it's bursting with colour. Hit any key to exit. Just for the record, HBLs are a clever way of gaining more than the usual number of colours on screen at once – 512 on an ordinary STF and 4096 on an STE!

## WHICH BIT DO I PRESS?

Most of the controls in *Canvas* are intuitive. In other words, just click on the thing you want to select and it'll happen. For example, the "Ellipse" control box does exactly what you'd expect it to do – draws an ellipse. There are some exceptions, though.

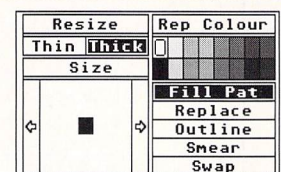


● Sometimes a bunch of icons are grouped together with a heading. In this particular case only one of the bunch can be selected at any one time, such as the object selector in the 3D construction screen.



Rotate Specbox

● Some selectors look like this – two sets of arrows and something between them. There are three ways of changing the value this selector represents. Clicking on the < or > arrows brings the value to the maximum or minimum value allowed. Click on the normal arrows to increase or decrease the value in increments of one. Finally, if you click on the value itself *Canvas* enables you to type in a number directly.



Brush Specbox

● Other boxes have a graphic in the centre and are surrounded by arrows. When you click on the arrows the graphic in the box changes in some way – here it alters the thickness of the line you're using for drawing. The arrows around the "Fill Pattern" box step through the available patterns, and so on.



# THE MAIN MENU SCREEN

Don't puzzle over the wealth of buttons on the main menu screen anymore. Here's a description of what each of the buttons enable you to do. When an option is said to be "Affected by..." something, it means the output from that option is altered by the selections made in the other sections. See their descriptions for more details to see just how.

## DRAWING TOOLS

**DRAW:** Used for freehand drawing. The "Options" box enables you to set the thickness of the lines you draw, their type (solid, dashed, dotted etc.) and whether they have square, arrowed or rounded ends. Note that dashes/dots only appear on the thinnest size of line. Affected by "Write Mode" and "Mirror" (see "Options"), "Colour" and "Rainbow."

**LINE:** Draw a single straight line by clicking on its start and end points. The line type is selected using the same box as in "Draw." Affected by "Write Mode" and "Mirror" (see "Options"), "Shadow," "Rainbow" and "Colour."

**K-LINE:** Like "Line," but enables you to draw lines that take their starting point from the last line's ending point, so they're joined. The right mouse button cancels. Affected by the same options as "Line."

**RAYS:** Draw straight lines coming from the same point. Select a point with the left mouse button. All lines drawn from then on have their starting point there. Move the mouse to fix the end point. Lines can be drawn continuously by keeping the left button held down and moving the mouse. The right button cancels. Affected by the same options as "K-Line."

**BOX:** Draw a box. Select the top left corner with the left mouse button and position the outline. The left button selects the bottom right corner. Affected by "Colour," "Rainbow," "Shadow," "Mirror" and "Write Mode" (see "Options"). If "Solid" (in the "Fill Pattern" box) is off, line attributes (see "Draw") also affect it otherwise, affected by "Fill Pattern" and "Rounded."

**ELLIPSE:** Draw an ellipse. Select the centre with the left button. Position the outline and click again with the left button to set the ellipse. Affected by "Colour," "Rainbow," "Regular," "Write Mode" and "Mirror" (see "Options"), and "Shadow." If "Solid" (in the "Fill Pattern" box) is off, affected by line attributes (see "Draw"). If "Solid" is on, affected by "Fill Pattern."

**POLYGON:** Draw a polygon. Has two modes: User Defined and Non-User Defined. The later brings up a box for you to select the number of sides and angle for the polygon. Draw as you would an ellipse. In User Defined mode, select each point's position with the left button. Affected by same attributes as "Ellipse," but "Rainbow" and "Regular" have no effect in User Defined mode.

**SPRITE:** Plot a predefined sprite (shape). The box enables you to choose which of the 16 sprites to plot and enables you to draw your own using a simple sprite editor. Affected by "Rainbow," "Mirror" (see "Options") and "Shadow."

**MARK:** Plot a predefined mark. The "Options" box enables you to choose the size and which of the six marks you want to use. Affected by "Colour," "Rainbow," "Mirror" and "Write Mode" (see "Options"), and "Shadow."

**FILL:** Fill in a completely enclosed area. The type of fill is determined by the pattern in the "Fill Pattern" box. "Solid" must be selected in the "Fill Pattern" box for anything to appear, and the selections in "Options" apply.

**ARC:** Draw part of an elliptical shape. Click once to set the centre of the ellipse and again to set the shape. A line appears enabling you to set the start of the arc. Set the other end of the arc the same way. The right mouse button aborts. The arc drawn is affected by "Colour," "Rainbow," line attributes (see "Draw"), "Write Mode" (see "Options") and "Regular."

**GRID:** Draw a grid over a rectangular area of the screen. Select the area using the left button to mark opposite corners of the box. A grid is then drawn according to the current grid size (see "Gd-Lock"). Affected by "Colour," line attributes (see "Draw"), "Rainbow," "Mirror" and "Write Mode" (see "Options"), and "Shadow."

**BLOCK:** Manipulate areas of the screen in various ways. See the box on page six.

**TEXT:** Write text. Brings up a box that enables you to select the angle of text (in 90 degree intervals), the effects (bold, light, italic etc.) and the size of the letters. The left mouse button chooses the starting point, type in the text ([Backspace] to delete, [Escape] to clear) and hit [Return] to fix text. Affected by "Colour" and "Write Mode" (see "Options").

**SPRAY:** Emulates an airbrush. Brings up a box that enables you to select the flow rate (from one to nine, nine is fastest) of the pixels, and the size of the nozzle. Affected by "Colour," "Rainbow," "Mirror" and "Write Mode" (see "Options"), and "Shadow."

**SEGMENT:** Draw a filled part of an ellipse/circle. Use the same method as for drawing an arc. "Solid" (in the "Fill Pattern" box) must be on. Affected by "Fill Pattern," "Colour," "Rainbow" and "Write Mode" (see "Options").

**BRUSH:** Perform various operations with a square brush shape. See the box on page seven.

**ZOOM:** Examine and edit an area in more detail. See the box on page six.

Draw	Fill
Line	Arc
K-Line	Grid
Rays	Block
Box	Text
Ellipse	Spray
Polygon	Segment
Sprite	Brush
Mark	Zoom



The "Fill Pattern" options are covered in a separate box overleaf.

## THE ACTION BOX

**COLOUR:** Palette options. Change the current palette (from 64 possible) and the colours within a palette in various ways. Also set HBLs.

**OPTIONS:** General options. Define 1 and 16 colour fill patterns, display an on-screen zoom area (hotspot), print the manual, set a mirror, change the current workscreen (four on a 520, 20 on a 1040) and change the "Write Mode" (which affects how a function's output changes what's already on the screen).

**FILE:** Load, save, rename or delete various format files, format a disk, find the free space on a disk, or quit the program.

**PRINTER:** Print a screen and change the printer type/output quality.

**CURSOR:** Change the cursor to one of five predefined shapes.

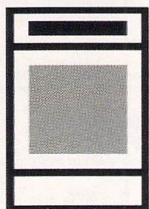
**GD-LOCK:** Change the size of the grid used by "Grid," overlay a grid onto the screen, and force certain functions to "snap" to the current grid.

**WINDOW:** Define an area of the screen as a "clipping rectangle," outside of which you cannot draw. Useful for changing only selected parts of an image.

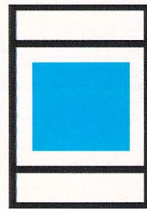


<b>Draw</b>	<b>Fill</b>	<b>Size</b>			<b>Type</b>			<b>Ends</b>	
Line	Arc								
K-Line	Grid								
Rays	Block								
Box	Text								
Ellipse	Spray	<b>Define</b> 							
Polygon	Segment								
Sprite	Brush								
Mark	Zoom								
<b>Fil Pat</b>	<b>None</b>	<b>Colour</b>	<b>Gd-Lock</b>	<b>Rotate</b>					
	Pattern	Options	Window	Shadow					
	Hatched	File	Animate	Undo					
	1 Col FP	Printer	3 D Obj	Erase					
	<b>Solid</b>	16Col FP	Cursor	Regular					

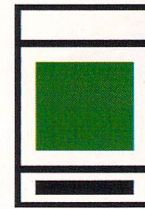
This portion of the screen changes depending on the option selected.



"Rotate" and "Rainbow" range selectors.



The "Colour Selector" shows the current palette and the selected colour.



"Rotate" and "Rainbow" range selectors.

<b>Colour</b>	<b>Gd-Lock</b>	<b>Rotate</b>
Options	Window	Shadow
File	Animate	Undo
Printer	3 D Obj	Erase
Cursor	Regular	Rounded

**ROTATE:** Rotate certain colours within a palette to give simple animation.

**ANIMATE:** View, create or change an animation sequence. See the tutorial on page two.

**3D OBJ:** Create/view a 3D object. See the tutorial on page two.

**REGULAR:** If this is selected, only circles can be drawn in "Ellipse" mode and only regular polygons drawn in "Polygon" mode.

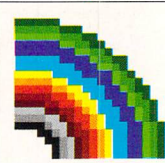
**SHADOW:** Adds a definable shadow to the output of most functions.

**UNDO:** Remove anything you've just done to the workscreen.

**ERASE:** Clear the current workscreen entirely.

**ROUNDED:** Gives rounded corners to solid boxes.

The "Rainbow" icon, when selected, affects the output of most of the drawing functions. It forces whichever function you're using to use all the colours in its range for the output. In this way you can have multicoloured lines, boxes and circles simply by selecting "Rainbow." Move the "Rotate" markers on the "Colour Selector" to set the number of colours it uses.

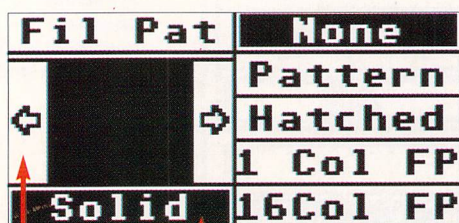


**TIP:** If you create a 16 colour fill pattern and select a range of colours on the selector, then only those colours will be used in the fill pattern. If you design the fill pattern properly, this means you can, in effect, get several patterns from one design.



## THE FILL PATTERN BOX

This selects which pattern to use when filling solid shapes.



Use no pattern – just a solid colour.

Two sorts of patterns, 36 different ones in total.

Eight definable patterns, using one and 16 colours respectively. Define using "Options."

The selected pattern is shown here. Use the arrows to cycle through them.

"Solid" affects the drawing of many shapes and determines whether they are displayed filled or not.

## THE ZOOM STUDIO

To use "Zoom Studio," select it and then go to the workscreen. Move the box to the area you want magnified and click.



Mode to work in on the display.

Change the size of the brush for "Draw" mode.

Selector for the colour while in the "Zoom Studio."

Scroll around the screen using these; the lines show where you are in relation to the top left of the screen.

Zoom in/out in nine stages by clicking the + and -.

Enlarged display, which can be edited directly.

## THE BLOCK MENU

Block Mode		
Cut	H-Wrink	Digit
Copy	V-Wrink	Spin
Paste	H-Flip	Pattern
Brush	V-Flip	Replace
Resize	H-Sheer	Outline
PResize	V-Sheer	Swap

The "Block" mode has many options that enable you to alter rectangular areas of the screen in some way. With the exceptions of "Outline," "Replace," "Swap," "Cut" and "Copy," the modes require you to have an image in the copy buffer. To do this, use the "Cut" or "Copy" modes.

fill up the area you selected. Obviously the area you select should be bigger than the image.

**REPLACE:** enables you to replace a colour within an area with another. Choose the colour to be replaced from the "Rep Colour" selector in the "Brush" box that appears. Choose the replacement from the main colour selecto, select an area and the replacement occurs.

**OUTLINE:** select an area to draw an outline around it. Set the thickness with the "Outline" option in the "Brush" box. "Rep Colour" sets the colour to outline and the outline colour is set to the current colour.

**SWAP:** same as "Replace" but the replacement happens

both ways, so each instance of the "Rep Colour" is replaced with the main colour, and each instance of the main colour is replaced with the "Rep Colour." Try it!

**TIP:**  
Remember, most functions need Solid selected in the Fill Patterns box for them to work. If you try to draw something and nothing appears, check this first

**CUT:** select two opposite corners of the area by clicking the left mouse button for each corner. The bell sounds, the image is copied to the copy buffer and is erased from the screen.

**COPY:** same as Cut, but the image isn't erased.

**PASTE:** enables you to place the contents of the copy buffer anywhere on screen by clicking with the left button.

**BRUSH:** same as Paste, but is continuous so you can draw a whole line of images.

**RESIZE:** select a position with the left button, then move the outline to resize the image and use the left button again to fix it.

**PRESIZE:** same as "Resize," but only enables you to resize in proportion to the original dimensions.

**H-WRINK/V-WRINK:** plot the image using the left button. Select the width and height of the wrinkle with the mouse, and fix with the button.

**H-FLIP/V-FLIP:** position the image and click to flip it horizontally or vertically.

**H-SHEER/V-SHEER:** skews the image horizontally/vertically. Select the position with a click, move the mouse to change the shape and click again.

**DIGIT:** select the position. The image is drawn in blocks of the size of the current grid (see "Gd-Lock"). The most common colour of the pixels in each block is used to draw a solid rectangle, reducing the resolution.

**SPIN:** select the position with the button. Spin the outline with the mouse and click again.

**PATTERN:** select an area in the same way as "Copy." The image in the copy buffer is then drawn repeatedly to



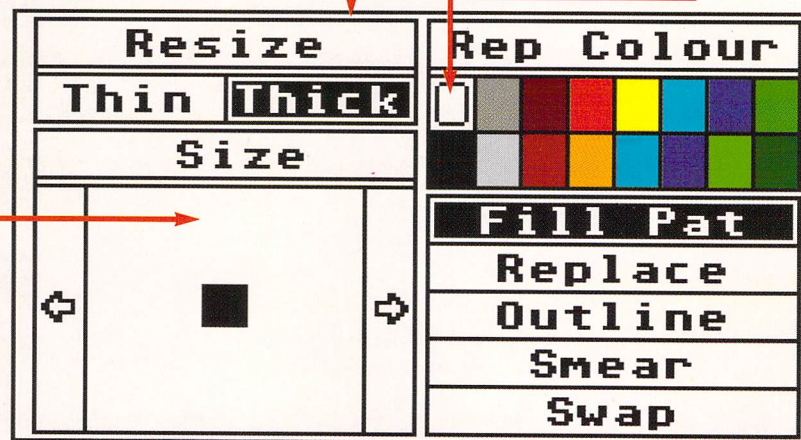
## THE BRUSH BOX

In this mode, pressing the left button on the workscreen performs the selected function on the square area around the cursor. All modes are affected by "Mirror" (see "Options"), "Shadow," "Rainbow" (except "Smear"), and "Colour" (except "Smear").

Outline thick/thin selector. Used with the "Outline" function and also with the "Outline" function in the "Block" menu (see "Block").

Secondary colour. [Space] on the workscreen swaps between the main colour and this secondary colour. Also used as the source colour for the "Replace" and "Outline" "Brush/Block" modes.

Size of the brush (that is, the area affected by "Brush"). Alter with the arrows.



Plots a square using the fill pattern.

Same as the "Block" option of the same name.

Same as the "Block" option of the same name.

Randomly changes the position of the pixels under the cursor.

Same as the "Block" option of the same name.

## WIN ● WIN ● WIN

### £200 for the best step-by-step series of pictures of your own

Using even the very basic painting and drawing features in *Canvas* you can create some visually astounding pictures on your ST. Each month we receive a vast number of contributions to our Gallery section proving that amazing results really are possible.

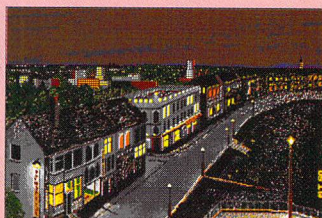
Now, to see how good you are we're offering a £200 prize to the best *Canvas* artist. Simply create three pictures. As you draw them, save about six stages of the pictures to disk, giving each a different file name.

Now write a detailed description of the functions you used and the way you used them to build up your picture. Also let us know your all-time favourite piccies. Check out the Gallery section on page 126 of the accompanying issue to see the

step-by-step guides we want – but we need more detail about how you created your piccies.

Send your own entries to *Canvas* compo, ST FORMAT, 30 Monmouth Street, Bath, BA1 2BW by Friday 14 February. Even if you don't win our fabulous competition, we might use your pictures in our Gallery section giving you instant fame and possibly wealth.

All the usual rules apply – all entries must land on the ST FORMAT doormat by Friday 14 February; employees of Future Publishing and Microdeal and forbidden to enter, as are their relatives; no cash alternative can be offered; only one entry per household; the Editors decision is final.



● These are just some of the pictures which have been created in *Canvas* and submitted to our regular Gallery section. Even if you don't win this competition, you could still win some cash and obtain ever-lasting fame by submitting your pictures to Gallery. Check out page 126 in the January '92 issue to see what readers have been creating this month, then send your own piccies to Gallery, ST FORMAT, 30 Monmouth Street, Bath, BA1 2BW. Go on – start exercising your creative talents with *Canvas*.

## TAKE THE KEYBOARD SHORTCUT

Many of *Canvas*'s features can be reached by a keypress rather than having to wade through menus with the mouse. Once you know your way around *Canvas* and you know how the different options work, start building up your speed with these shortcuts.

Simply hit the following keys to obtain the quoted result:

3	3D Construction Studio
A	Animation Studio
C	Colour Options box
D	Delete File
E	Rotate Options box
F	File Options box
G	Grid Options box
H	View HBLs
I	Disk Information
L	Load File
M	Mouse Cursor Options box
O	General Options box
P	Printer Options box
Q	Quit
R	Rename File
S	Save File
V	3D Viewing Studio
W	Shadow Options box
+/-	Rotate colour palette one place left or right

### Keyboard controls:

<Escape>	Erase current workscreen
<Help>	Display Help menu
<Space>	Alternate between main colour and secondary colour on workscreen
<Undo>	Guess!



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## Exile

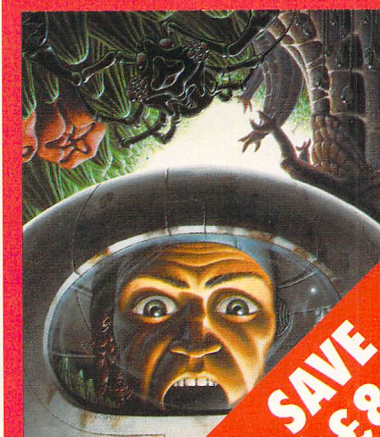
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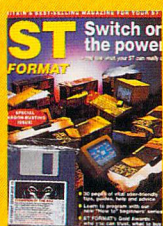
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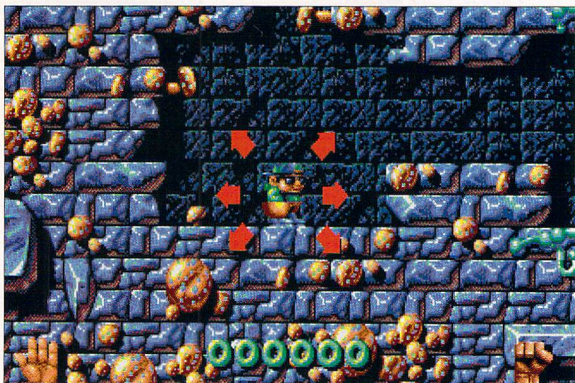
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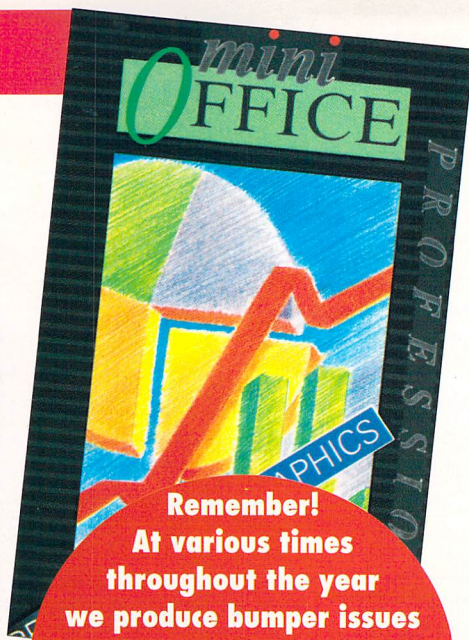
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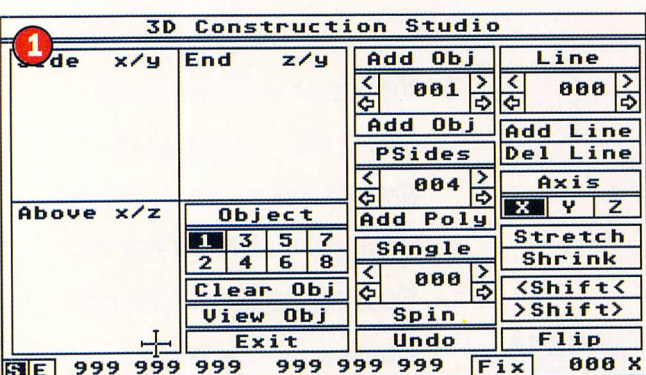
# GRAPHICAL MASTERPIECES COULDN'T

Canvas has two special areas, a 3D object construction/viewing section and an animation section. It's possible to combine them to obtain realistic solid 3D animations (with a bit of work). We'll be creating a rotating solid 3D triangular prism. (We could have used cubes but they're boring). Before we start, a word about 3D objects.

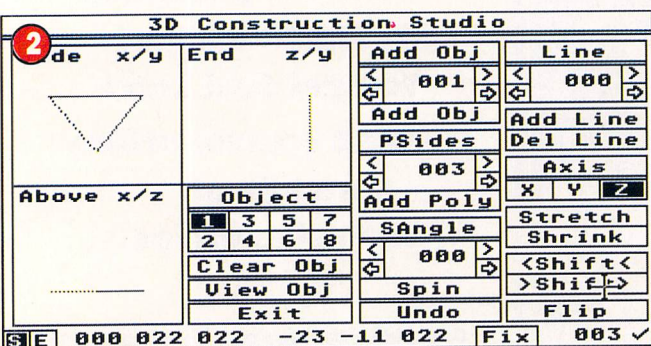
3D objects are constructed simply by creating lines and then joining them together. If you wanted to create a cube, you would need to create 12 lines and join them up into a cube shape - it's

as simple as that. Unfortunately the object has to be created using three 2D views (the object as seen from the front, side and top, known as an orthogonal projection), and it's sometimes difficult to visualise a 3D shape in this way.

Think of a triangular prism. It's made up of two triangles joined by three lines. The Canvas 3D Construction Screen enables you to create flat polygons (many-sided shapes, such as triangles or squares) with one command, without having to create each line individually.

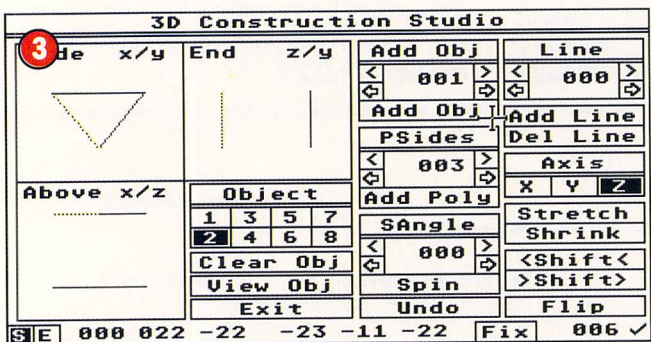


Enter the 3D Construction Screen by clicking on "3D Obj" from the main menu. You should be presented with another screen with three small windows and lots of buttons and text icons. Although there's nothing in the windows at the moment, they're used to view the object from the side, top and front (you can see which is which by their titles). The rest of the screen helps you with this process. Eight objects can be in memory simultaneously. The number of the object you're editing is changed with the "Object" box. Make sure it's set to 1. The first thing to do is to create the ends of the prism. For this, we can use the polygon feature to make a triangle. Change the number in the "PSides" box to 3 - this sets the number of sides the polygon should have. Make sure X is selected in the axis box, as we want the polygon to appear along the X axis. Click on "Add Poly" and a triangle appears: don't move the mouse, just click again. The triangle's shape is now fixed. Remember the triangle is made of three separate lines, it's just that we created it with one command.



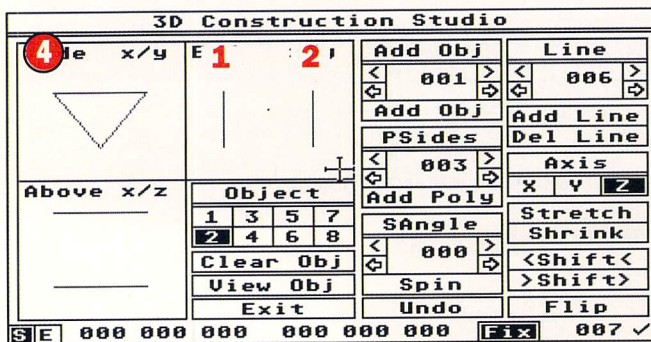
Note the number in the bottom right corner of the screen. It shows the number of lines currently in existence in this object (three at the moment). Next to it is a tick or cross. This indicates whether the line you have selected has been created yet. Also at the bottom of the screen you can see two sets of three numbers. These are the X, Y and Z co-ordinates of the start and end of the currently-selected line.

Click on Z in the axis box. Now click ">Shift>" to move the triangle along the Z axis. Do this until the Z co-ordinate (the third number) is the same value as the Y co-ordinate (the second number). If you've done everything right it should be 22 or thereabouts.



That's one end of the prism created. To make the other, we can simply duplicate this object and move it to another position. Click "2" in the "Object" box. Make sure the number in the "Add Obj" box is set to one and then click on "Add Obj." Answer "Yes." The triangle appears in the same place as we left it. What we've done is to take object number one (the triangle) and added it to two. Since there was nothing in two to begin with we've only got the triangle at the moment.

Now click on "<Shift<" until the Z co-ordinate is the negative of what it was. So if it was at 22, click until it's -22. Click on "Add Obj" again and answer "Yes." Now we've got both ends of the prism.



The ends need to be joined with lines to make a proper 3D object. Change the number in the "Line" box until a cross appears in the bottom right - in other words, until you reach a line that hasn't yet been created (this should happen at line six). Click "Add Line" to create it. Now click "Fix." "Fix" is basically an aid to help you join lines accurately without having to find their specific co-ordinates.

Lines are represented by their start and end co-ordinates. At the bottom left you'll see the letters "S" and "E." Click on "S," which means you want to set the start of the line. Now look at the illustration and click on point 1 to set the start there. You don't have to click exactly on the point as "Fix" places it accurately for you. Click on "E" to set the line's end. Click on point two from the illustration.



# BE EASIER TO CREATE WITH ST FORMAT

Move the "Line" number forward by one again. Click on "Add Line" to create it. Set the start and end points at points one and two again.

**TIP:** When designing 3D objects, try drawing them on paper first, visualising them from the necessary angles. That way all you'll need to do in Canvas is create and join the lines from your sketches.

Do this a third time for the third connecting line. The prism is now complete and the line count number in the bottom right should read nine.

**TIP:** If you create a 16 colour fill pattern and select a range of colours on the selector, then only those colours will be used in the fill pattern. This means you can, in effect, get several patterns from one design.

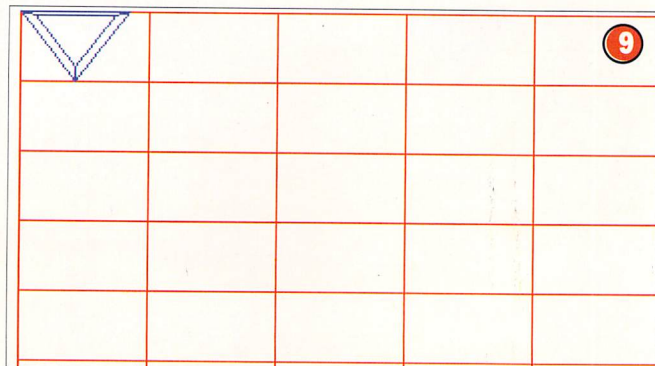
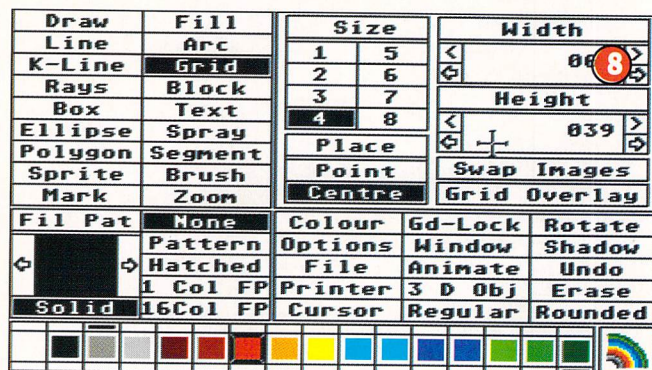
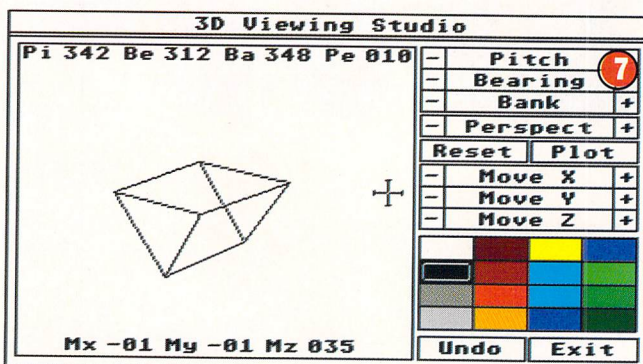
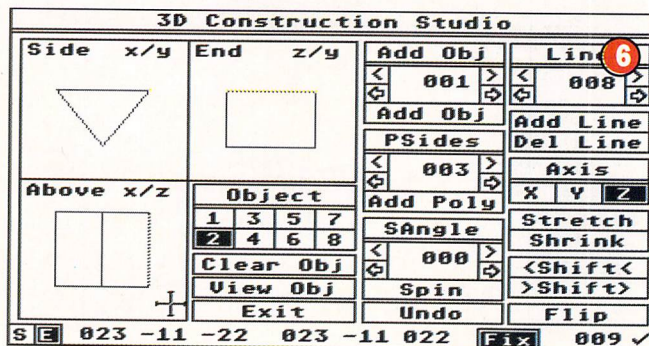
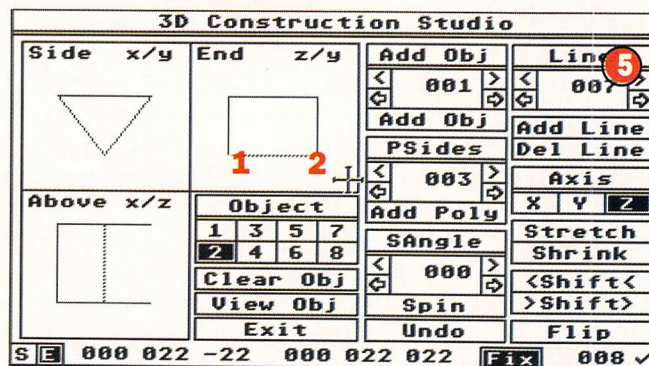
Now we want to have a look at the prism in 3D. Click on "View Obj" to enter the viewing screen. To the left is the main display and to the right are the controls. Click at the top of the left window until a set of co-ordinates appears. Mess about with changing the "Pitch," "Bearing" and "Bank," and the "Move X, Y and Z" buttons, and see how the 3D object moves. You can accomplish some superb animation by plotting each frame sequentially on the screen and then telling Canvas to display them in a certain order. The best way to place the frames evenly is to use a grid and place one frame in each. We'll be animating the prism turning it around the Y axis.

Exit from both the 3D Viewing and Construction Screens back to the main menu. Click on "Grid." What we need to do is cover the screen in a grid whose squares are just wide and tall enough to take the frames of our animation. Assuming the Z co-ordinate in step three of the creation process was 22, this means we need a grid of 64 x 39 pixels, so set the width and height appropriately. Choose a colour that won't be in the animation, say red. Draw the grid over the whole screen.

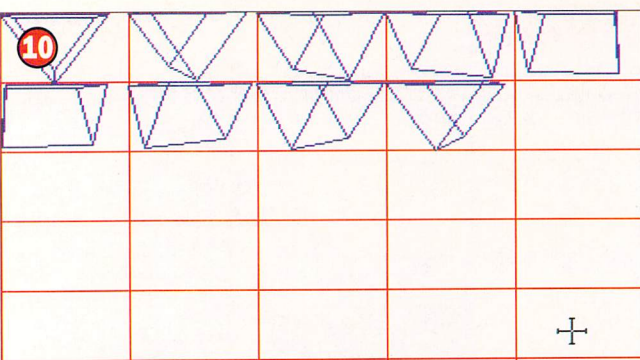
**TIP:** Don't use Canvas with the commercial screen accelerator Turbo ST. Although, as you'd expect, the screen update is considerably faster, the zoom modes don't function properly.

Return to the 3D Viewing screen and click on "Reset." Choose a suitable colour, say blue. Now click on "Plot." You're taken to the workscreen with the 3D object as your cursor. Position the object inside the first frame and click once to draw it: make the very topmost and leftmost parts of the object overlap the grid lines.

**TIP:** Set the Secondary Colour to whatever background colour you're using, then you can just hit Space to swap between the Primary and Secondary colours and have an instant "eraser" available

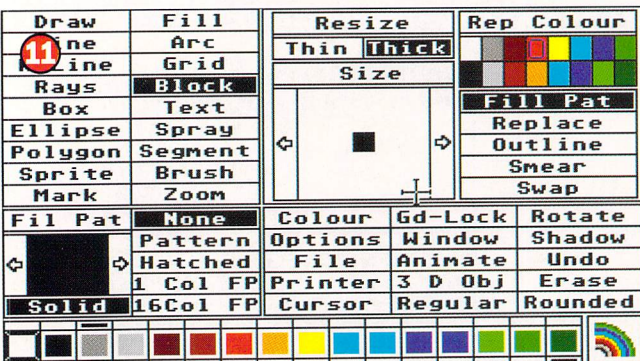




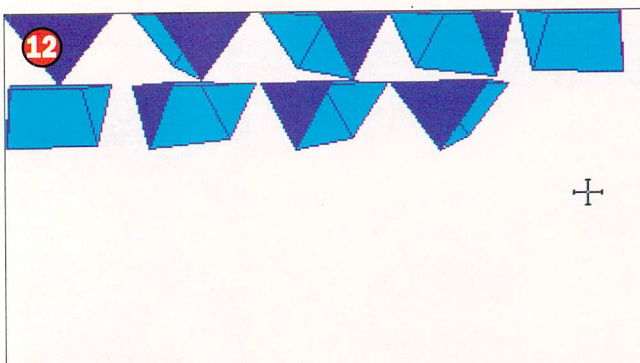
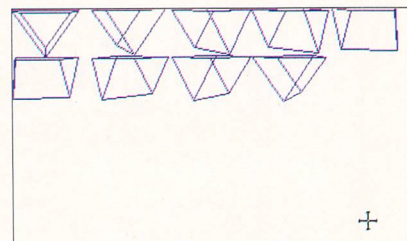


Click the right mouse button to get back to the 3D View. Click on "Bearing +" until it's increased by 20. Click on "Plot" again and put the object in the next frame. Repeat this process of increasing the bearing by 20 and plotting until you've drawn objects up to and including bearing 160.

**TIP:**  
Canvas is very useful for retouching digitised images, owing to its simple palette functions and the ability to selectively swap and replace colours in areas of the screen. Use Block Replace.

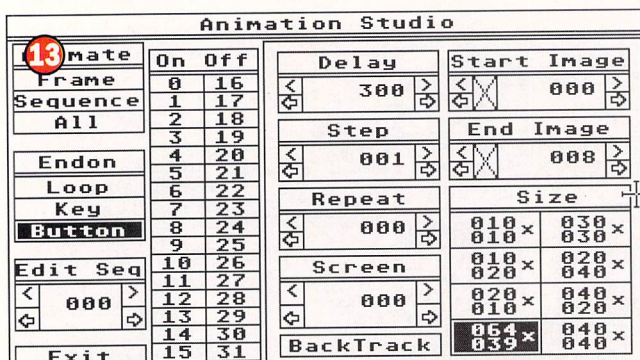


We'll have to remove the grid or else it will be animated too. Select "Block" and then "Replace" from the "Options" box. Select the colour you used to draw the grid in the "Rep Colour" box (red) and select white from the main colour selector. Go the workscreen and draw a box over the whole screen. The red is replaced with white, deleting the grid.



Now fill in the object's sides with various shades of colour. As only two sides are visible at once in our example, use two shades of blue. Make sure you keep the colouring consistent for each frame.

**TIP:**  
Remember, most functions need Solid selected in the Fill Patterns box to make them work. If you try to draw something and nothing appears, check this first.



Now click on "Animate." We need to tell Canvas which frames to start and end on, what the frame size is and what delay to leave between frames. Click on the appropriate grid size from the displayed list (64 x 39) and then on the cross in the "Start Image" box and you're taken to the workscreen. You can move the displayed box only in increments of the set size, so move it to the top left of the screen and click to select this frame as the start. Repeat the process for the "End Image," but select the last frame. Finally, change the number in the "Delay" box to 300 or so (otherwise the animation hurtles along so fast you can't see it).



Then simply click on "Sequence" to see your animation – a revolving filled triangular prism. Obviously, this is the simplest form of animation there is. You could have rotated the prism in three axes, or constructed a more complex object. There's no need to show the frames in order – you could build up sequences of frames and display them one after the other. Play around with parameters on the "Animation" screen to vary your sequence, and save it if you want from the "File" screen (use the "Sequences" option).