

PAINTBOX II

**For the BBC Model B
and Acorn Electron**

**by
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BEEBUGSOFT



PAINTBOX is probably the ultimate drawing program for the Electron. It is highly sophisticated and yet easy to use. Use it to doodle or to design intricate full colour pictures.

As well as featuring an "elastic band" cursor, PAINTBOX will draw in full colour with various widths, and will automatically draw (and fill) circles, triangles, rectangles, etc.

The keyboard may be used to insert text anywhere on the screen, using any colour and in any seven sizes.

All options are selected from an on screen palette.

Graphics may be produced in eight colours and painting achieved in eight different brush widths. A special feature permits automatic shading of any area, in a combination of any two colours.

As well as dots, lines, airbrush or freehand sketching, horizontal and vertical stripes may be automatically drawn.

Screens may be saved or loaded from disc or cassette.

If you want to create colourful screens, PAINTBOX is the program for you!

Acknowledgements

This original PAINTBOX program was inspired by the interest taken by Mark and Debbie in its continuing development and who were responsible for many of the published Paintbox pictures. My thanks to them and Dave Warring whose criticisms and assistance with the DFS were highly valued.

FORWARD

PAINTBOX gives a superb example of the graphics capabilities of the BBC and Electron computers. It will provide you with a very sophisticated tool for designing and drawing the most interesting and intricate pictures.

As with any sophisticated package it will take some time to master all of the features and become fully conversant with them. A few hours of practice should enable you to create simple, but effective pictures or designs. More practice will improve your skill yet further.

The program may be used at a number of levels, from doodling with simple Etch-a-Sketch type results, through to designing detailed and complex graphics and pictures.

The recommended approach for less experienced users is initially to explore each of the main drawing features detailed in Section 2 of this manual where the use of each option is fully described. Helpful tips and suggestions are also included with examples of how to use the feature described to best effect.

Delving further into the "Option menu" and its program extensions should be avoided until the manual has been read fully and the more familiar features have been mastered. Happy Painting.

D.J.F.

FEATURES OF PAINTBOX II

(These are not commands)

BROWSE screens created, for Disc Users.

BRUSHES have eight preset widths, or variable width.

BRUSH shapes may be - Triangle, Square, Circle, Airbrush or User-defined characters.

CREATE your own brush characters, shading and text.

CO-ORDINATE values can be displayed.

DEFINE "Move" Keys and User character brush shapes.

EIGHT colours in MODE 2.

ELASTIC band cursors show precise line, triangle or rectangle about to be drawn.

ERASE the screen to the current brush colour.

FRIENDLY and easy to use, screen prompts and instructions.

GCOLS, all modes are available.

HIGH resolution 640x256 points in MODE 0.

INFILL - Fast machine code fill in any standard colour. Alternate colour "Mix" option to give extra shades.

LOAD the screen from cassette or disc filing systems.

LOADER supplied to enable created Screens to be used in other programs.

MODES. PAINTBOX II will operate in Modes 0, 1 and 2.

MOSAIC and other pattern effects may be created.

OPTIONAL LOAD/SAVE. User created character brushes from/to cassette or disc.

PALETTE has eight standard colours plus "Fill and Mix".

PLOTTING of lines, triangles, rectangles, circles (filled and outline), and brush shapes as above.

PRINT screen; Epsom dump included (or access User's routine).

SAVE the screen to cassette or disc filing systems.

SELECT between Joystick or Keyboard input at any stage.

SHADING. Use of character brushes and grid option provides for many alternatives.

STATUS of all the current options is reflected in the Function menus at the top of the screen.

STRIPES. Horizontal and vertical - Eight preset or variable spacing.

TEXT. Eight preset sizes or variable size. Drop shadow, outline and other effects may be created.

VARIABLE size brushes, text and stripe spacing.

1. INSTRUCTIONS FOR LOADING PAINTBOX II

1.1.1 CASSETTE USERS

Insert the cassette in the recorder and type CHAIN""

Press <RETURN> and then press Play on your recorder.

The program should load in the normal manner. After it has loaded, stop the recorder then follow the screen prompts. (See GETTING STARTED WITH PAINTBOX II, section 1.2)

1.1.2 DISC USERS

Insert the program disc in drive 0 and 'boot' the disc:

- 1) Hold down the <SHIFT> key
- 2) Press the <BREAK> key
- 3) Release the <BREAK> key
- 4) Release the <SHIFT> key

After the program has loaded, follow the on screen prompts.

1.1.3 PROGRAMS ON DISC/TAPE

1. PNTBOX Beebugsoft leader
2. PAINTII Loader
3. NEWBOX Main program
4. SCREEN Demonstration screen (2.SCREEN or disc)
5. BRUSHES Alternative set of 10 FNkey Brushes
6. PRINTER Load and print screens (Tape Users)
7. DEFINER Define or modify character brushes
8. LOADER Utility to use screens in your programs

1.1.4 PROGRAMS ON DISC ONLY

9. BROWSER Browse and print screens
10. S.SCREEN Duplicates 2.SCREEN
11. S.BRUSHES Duplicate of BRUSHES
12. S.SC1 etc. Introductory screens

N.B. Only the file SCREEN, and the programs LOADER and PRINTER (Tape) or BROWSER (Disc) may be used independently of the menu option in PAINTBOX II.

1.2 GETTING STARTED

PAINTBOX II will work with either standard joysticks (Plus 1 interface required) or from the keyboard. If you are using the former, you will need to fit your joysticks to the analogue port of your computer.

When the program has loaded, you will be offered a number of options outlined below. Press 'Y' for YES if you want to choose the option, or 'N' for NO if you do not.

If you are using the program for the first time answering 'N' to both options will enable the main drawing facilities in PAINTBOX II to be explored.

1) Option Menu (Y/N)?

Extends the choices to include further options. (See Section 3)

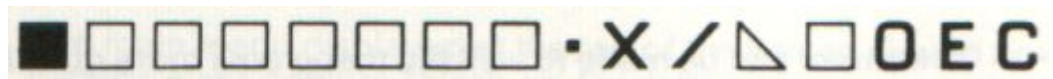
The main program NEWBOX then loads.

2) Joystick (Y/N)?

Establishes the initial use of joystick or keyboard control. (In the instructions that follow, the use of the keyboard is assumed. If a joystick is selected, any reference to the Space bar should be interpreted as the joystick fire button).

1.3 THE MAIN MENU

A menu will now be displayed at the top of the screen (this is known as the Main menu), and looks something like this:



These cells are used to set the current brush size, colour and shape, erase the screen, select the SECONDARY menu; they are described in section 2.

Also on the screen somewhere will be a cross. This will be referred to as the "cursor". It is used to make selections from the menus, and indicate where you want to draw on the screen.

1.4 MOVE KEYS

If you are using the keyboard for input then the cursor is controlled with the following keys:

L - Left, ; - Right, P - Up, . - Down

Speed of movement may be increased by also pressing the <SHIFT> key.

More precise control may be obtained by pressing <CTRL> with the direction key.

A complete list of keys and their uses can be found in the appendix.

1.5 COLOURS and OPTIONS

These are simply selected by moving the cross cursor to the menu area until the required feature is under the cursor. Pressing Space (or joystick button) will complete the selection.

The cursor can be made to visit the menu area more quickly by pressing <DELETE>. After selection from the menu, pressing <RETURN> will put the cursor back to the last picture position.

Switching between the menu area and your picture is always possible by using these keys.

2. FIRST STEPS - A TUTORIAL

2.1 THE MAIN MENU

The main menu displayed at the top of the screen should now display eight colours (black on the left) and the symbols - DOT, X, LINE, TRIANGLE, RECTANGLE, O, E, C:



If you are using a joystick, try moving the cursor. If it does not move then you probably have the wrong joystick of the pair. If switching to the other joystick still results in no movement, check that they are plugged in.

When the program is first entered, the brush colour is white (indicated by the white symbols in the menu), and the brush size is just a dot indicated by a dot to the right of the white colour select cell. The X to the right of the dot indicates that no brush shape is available because of this.

2.2 DOTS

Position the cursor on the Dot symbol in the menu area to the right of the colours. Press Space. This is known as 'acquiring' the feature under the cursor.

Move the cursor to the required position on the screen. Each time Space is pressed, a dot will be drawn beneath the cross of the cursor in the current colour. Keep Space depressed and move the cursor to draw a continuous line of dots.

2.3 COLOURS

Move to the appropriate colour on the menu and acquire. When acquired, the graphic characters in the menu area will change colour to reflect the new selection. Everything drawn from now on will be in this colour.

To produce different coloured dots move the cursor on top of the required colour and acquire. Return the cursor to the drawing area of the screen and press Space as before; coloured dots or trails will now appear.

2.4 ERASE (CLEAR) THE SCREEN

By now you probably need to erase the screen. This is simply done by returning to the menu, this time to the cell marked E.

This option must be acquired *twice* to clear the screen to the currently selected colour. This minimised the chance that the screen is erased in error.

2.5 LINES

Move the cursor on top of the diagonal 'Line' symbol (/) at the top of the screen and acquire it. You have now selected line drawing mode in preference to dot drawing mode.

Move to the drawing part of the screen and acquire. Now move the cursor and you will see a line traced out behind you. This is known as the 'elastic band cursor'. When Space is pressed again the line will be fixed, and added to the screen permanently.

Notice two special effects:

1. The line is in the same colour as the last dot produced. (Colours remain until reselected).
2. The line is dotted and not solid.

2.6 TRIANGLES

Move the cursor to the TRIANGLE at the top of the screen and acquire. Note that a triangle will need three points to fix.

Move the cursor down the screen and press Space; you have fixed the first point. Now move the cursor to the next point and you will see the 'elastic band cursor' tracing out a line. Press Space, now move the cursor to the third point and you will see a 'triangle elastic band cursor'. Press Space once more to finally fix the triangle. Again note that the currently acquired colour remains.

2.7 RECTANGLES

Move the cursor to the RECTANGLE at the top of the screen and acquire. Move the cursor down the screen and press Space. Now move the cursor and you will see a 'rectangle elastic band cursor'. Press Space once more to fix the rectangle. Again note that the currently selected colour remains.

Note - In all three options above, if a new colour choice is required, this may always be acquired even in mid-plot.

2.8 OUTLINE/FILL - (SOLID AND DOTTED LINES)

Initially all lines drawn are dotted. This is very easy to change using the O option on the menu.

Move the cursor to the O (for Outline) and acquire to change it to an F (for Fill). This will result in future lines being drawn as solid lines.

The choice of the letters O/F stands for Outline/Filled, and becomes apparent if selected when triangles, rectangles (or circles), are being drawn. In this case their symbols in the menu and the elastic-band cursors reflect whether they will be drawn Filled or in Outline.

The OUTLINE/FILL option may be changed at any time before drawing the final shape.

2.9 CO-ORDINATES

It helps greatly for precision work to have the co-ordinates of the cursor on display while drawing.

Co-ordinates are selected by acquiring the X cell *twice* to turn co-ordinates on, and *twice* again to turn them off. They will not appear until you move the cursor back into the drawing area.

Switching co-ordinates on or off will only be available if the brush size is set to 1 (indicated by a dot), since this is the only condition when the X is seen on the main menu.

2.10 THE SECONDARY MENU

CHANGE MENU

Select C from the main menu to switch or 'toggle' between menus. This takes the same right most cell position in both. Pressing <DELETE> when in keyboard input, immediately returns the cursor to this cell. The whole to of the screen will change to:

1 2 3 4 5 6 7 8 V G K T I S O C

This is known as the 'Secondary menu'. It is necessary because there are too many items to fit on the 'Main menu' we have just been using.

2.11 DIFFERENT SIZED BRUSHES

The first eight numbers and the V on the secondary menu refer to the size of the brush, which is initially set to 1 (DOT).

Move to number 5 (say) and acquire. You have now selected brush size 5. The menu will change back (automatically) to the Main menu. Look where the DOT used to be at the top of the screen, as it will now be replaced with the number 5. You can always refer to this size cell if you wish to know the currently selected brush size. The X will also have changed to a T (Triangle), since the brush may now take a shape.

Move the cursor to the drawing area and draw with the newly selected size and the triangle shape.

Note - The fixed sizes are related by a constant factor; SIZE 3 is half of SIZE 6 etc.

2.11.1 DIFFERENT SHAPED BRUSHES

Move the cursor on to the T (the shape cell) and acquire repeatedly to sequence through S (Square), C (Circle), A (Airbrush) and back to T again. Move to the drawing area and paint with triangular shapes.

The circular brush may be in outline or filled depending on the OUTLINE/FILL option, the former being indicated by a lower case 'c'.

Try the airbrush next by changing the C (for Circle) to A (for Airbrush). This will now allow you to spray a random collection of small dots from the cursor position. The spread of this spray is dependent on the selected size for the brush. Holding down Space or the joystick button will continue spraying and a denser pattern will appear.

2.11.2 VARIABLE SIZE BRUSHES

Apart from the standard brush sizes 1-8 you can select an intermediate or larger size using the V option. This is not so straightforward to set and needs the following action:

1. Select size V from the secondary menu.
2. Select the line drawing mode.
3. Move the cursor to the bottom left corner and press Space.
4. Move the cursor to a horizontal position that is equivalent to the brush size required, now press Space.
5. Move to Main menu option V and acquire.

You have now set the brush size equal to the length of the line drawn. This value will be retained until you choose to change it.

The line can in practice be drawn anywhere in the picture area, and does not necessarily need to be horizontal, since the size taken is the resulting x-co-ordinate length value.

You can avoid a visible line being drawn whilst defining the size, by choosing the colour to be the same as the background colour, before drawing the line.

2.11.3 GENERAL BRUSH SELECTION

It is only necessary to access the secondary menu if a new brush size is required. If the displayed brush size is suitable, this may always be acquired by visiting the size (number) cell on the main menu. If the displayed shape is not required, return to the adjacent shape cell and sequence until the desired shape is seen. Return to the drawing area is with the displayed size *and* shape brush.

Further selection from any of the Secondary menu cells 3-8 will result in the chosen size and standard brush shape T being loaded ready for use and returning to the main menu automatically.

2.11.4 USER-DEFINED BRUSH SHAPES

Select brush size 2 from the secondary menu. On returning to the main menu '~' (tilde) will be displayed as the default user-selected brush shape.

Move to the brush shape call with the cursor and acquire. Any keyboard character can now be entered as the new shape. (In addition, the function keys f0-f9 (with or without the SHIFT or CTRL keys) have pre-defined characters which give rise to various stippling effects.)

(User-defined character brushes can also be defined. See Option Menu, section 3.)

2.12 STRIPED RECTANGLES

First select a brush size other than 1. Make sure the FILL option is selected from the main menu, then move to the RECTANGLE cell. Successive presses of Space will see the cell change from solid through horizontal stripes to vertical stripes. Stop when the one you require is on display.

When a rectangle is finally drawing it will have stripes proportional to the brush size selected. (You can always select an intermediate brush size with the V option and define a different spacing.) Drawing firstly with horizontal and then with vertical stripes in the same area produces a grid structure.

Note - the option changes to the next in sequence each time it is selected, the one in use is always that displayed.

2.13 GRID - DISCRETE CURSOR MOVEMENT

Select G from the secondary menu. In its place a hash "#" will appear as will a number to its immediate right. This represents the number of discrete units the cursor will now move with each step, and can be changed by selecting a number from the digits 1-8 displayed top-left, or V which has the value 9.

This mode is very useful for aligning accurately the edges of polygons and the ends of lines, and for producing grids and mosaic patterns in conjunction with the STRIPED RECTANGLES option (See 2.12 above).

Note - In order to change the brush size, the grid must first be de-selected.

2.14 JOYSTICK/KEYBOARD OPTION

When the grid option is not in use, the current input mode is indicated on the secondary menu as either a J (Joystick) or K (Keyboard).

Visiting this cell enables the input mode to be changed at any time. The option of Joystick (Y/N)? is given, and returning "Y" results in Joystick being confirmed in the menu as the input mode. If joysticks are not fitted, or Keyboard is required then input "N".

Should you require to change between joysticks and keyboard when the GRID option is in use, simply turn off the grid, change the input option as required, then re-select grid ON.

2.15 INFILLING

This means filling any shape, and can be selected from the secondary menu by acquiring the letter I.

Select I (for Infill). The colour palette is then automatically displayed so that you can reselect a colour. Your choice of colour is shown (but not selectable) in the slightly smaller coloured box in the ninth position from the left. You may mix more than one colour by acquiring two colours in succession from the palette (this will give a striped effect), look at the ninth box to check the fill colour.

To fill a shape you must move the cursor to within the shape boundary and press Space. The boundary should have no gaps or the infill may 'leak' and

extend into unwanted areas. If this should happen the fill in progress may always be stopped by pressing the SHIFT key (the fire button with joysticks). Very complex shapes may require several goes to fill them, but most should fill completely.

For quickest filling, move the cursor to the lowest position before activating.

2.16 TEXT

Text can be plotted according to the brush size currently selected, brush size 1 being normal sized characters, all others being magnified proportionally.

Move to the secondary menu and acquire T (Text). The left part of the menu changes to display the colours, enabling you to select the colour of text that you want (between characters if you wish).

Move the cursor to the precise location that you want text to appear and press Space followed by the character of your choice from the keyboard; move to the next location, press Space followed by the character required etc.

If no character is required, press Return and after a short wait the cursor will re-appear. It may be helpful to select GRID ON to assist in aligning the text.

Text mode is turned off by making any other menu selection, even the Text option. This results in an automatic return to the main menu, and the displayed brush will be loaded automatically.

You may like to try these interesting text effects:

- 1) To obtain characters in outline, plot magnified text in GCOL modes 3 or 4. (See 2.17 for GCOL explanation.)
- 2) To produce drop shadow effects, plot the same text in different colours with a position offset. The GRID option will help you to position the characters.
- 3) To produce interesting patterns, press one of the function keys to access some of the user-defined brushes.

2.16.1 DELETING TEXT

Select GRID SIZE 4 to steady the positions. Select GCOL option 3 or 4. If the text position, style or composition is not satisfactory simply input the same character again, and the screen will be returned to its previous detail. Text can be finally fixed by selecting the GCOL 0 option. This technique allows titling to be tested. (See 2.17 for GCOL explanation.)

Alternatively, characters may be quickly deleted by plotting a filled triangle or rectangle appropriately coloured on top of the character.

2.17 GCOL LOGIC

The second item from the right on the secondary menu is usually displayed as a 0. This can be changed to any value from 0 and 4 by locating the cursor over the number, and acquiring, repeating until the number required is on display.

This option has special screen effects and you should refer to the BBC or Electron User Guide for a fuller description. But here is a brief summary:

- 0 plot the colour specified
- 1 OR the specified colour with that already there
- 2 AND the specified colour with that already there
- 3 EOR the specified colour with that already there
- 4 Invert the colour already there

The most commonly used options are 0 and 3. GCOL 3 used twice in succession in an identical way, returns the picture to the same form as it was before the first operation. The standard drawing option uses GCOL 0.

A familiarity with the various GCOL options enables many useful effects to be obtained, such as drawing and shading only in either the background or the foreground of the picture.

Draw some solid shapes in white on a black background, select a new colour and then try plotting and drawing other shapes over these with GCOL 1 selected and then repeat with GCOL 2.

Be careful not to alter the GCOL value by accident, or you will find unexpected results, (nonetheless predictable) when using other PAINTBOX II features.

2.18 SAVING THE SCREEN

2.18.1 TAPE USERS

Move to the S on the secondary menu and acquire *twice*. Now supply a valid filename (up to ten characters).

The default name of SCREEN results if RETURN is pressed with no filename.

The usual cassette file prompts inform and instruct the user, if a cassette system is being used.

2.18.2 DISC USERS

The default file of SCREEN may be conveniently used as a scratch-pad until the final picture is saved to its assigned filename. Remember that each save to this name (SCREEN) file results in the loss of the previous one.

The current mode is automatically appended to the directory of the filename. For example, saving a picture in mode 1 called 'name' will appear as "1.name".

Any drive may be selected through PAINTBOX II by using for example ':3.name' to access drive 3, for either load or save operations.

The disc version of PAINTBOX II has the advantage of being very much quicker to save and load screens, and give faster access to the Option menu program extensions.

Note - For the technically minded, the format for screen saving is:

```
*SAVE filename 3500 8000
```

2.19 LOADING A PREVIOUSLY SAVED SCREEN

Loading of previously saved screens is presented as an option whenever the ESCAPE key is pressed.

To load a screen from Disc/Cassette, press ESCAPE then press the 'Y' key, after which a "Name?" prompt results. Any valid filename key may be used. (Simply pressing RETURN will give the default filename SCREEN.)

A demonstration picture called SCREEN is provided to enable you to try this.

On a cassette system, press RETURN and then press PLAY on the tape recorder (with the previously recorded SCREEN dump already cued on tape). The picture then 'builds' on the screen.

All usual cassette filing messages are used to prompt the user, and should an unsuccessful load result, and the screen ceases 'building'. Either rewind the tape to just before failure and try again until the 'Loading' prompt appears, or if the file is corrupted, return to PAINTBOX II by pressing ESCAPE.

For the technically minded the format for loading pictures is:

```
*LOAD filename 3500
```

Consequently, any valid file can be loaded to the screen, even programs!

2.19.1 DISC USERS

The current mode is automatically appended to the directory of the filename. For example, loading a picture in mode 1 called 'name' will in fact load "1.name".

The Acorn DFS will allow you to override the designated mode directory. For example, to load in a picture called 'name', enter "\$.name".

2.20 CHANGING MODE

PAINTBOX II will work in modes 0, 1 and 2. The key sequence to bring about a mode change has been carefully chosen to prevent you from selecting it accidentally.

Select the secondary menu, move to the T and acquire. Move into the drawing area and press SPACE just as you would for text. Now, rather than press a key (to print a character), press the CTRL key.

The prompt 'Enter Mode 0,1,2 (2)' will appear. The number in brackets indicates the current mode, and if this is selected you will return to your picture unchanged. If one of the other modes is selected, the screen will clear and the menu will be drawn in the new mode. Note that although there are less colours to choose, the resolution is much better, and more detail can be drawn in modes 0 and 1.

In modes 0 and 1, solid rectangles can only be drawn with a brush size of 1. Other brush sizes will give shaded rectangles even though the rectangle

symbol appears solid. Careful selection of vertically striped rectangles will give rise to a variety of shading densities.

2.21 CHANGING THE COLOUR PALETTE

Although modes 0 and 1 have less than eight colours, it is possible to select which colours are displayed. For example, you may wish to change the black and white in mode 0 to blue and yellow.

Change to mode 0 as described in section 2.20 above. Move to the T cell again and acquire. The colour palette will appear as usual. Move to the cell with the small square just to the left of the grid cell G. Press the Space bar and the currently selected colour will change to a new colour. Each successive press of SPACE will cycle to a new colour. Stop when yellow appears.

Move to the black colour cell far left and acquire. Its colour can now be changed in exactly the same manner. In this way, it is easy to select any coloured background you want.

3. THE OPTION MENU

The Option menu is available immediately after loading PAINTBOX II.

It provides a number of features that are not directly available from the main program:

- | | |
|----------------------------|--|
| 1) Load PAINTBOX II | Enter main drawing program |
| 2) Change direction keys | Re-define "move" keys from default values |
| 3) Define User Brushes | Define/Save character brush options (Maximum 10) |
| 4) Load Filed User Brushes | Load Function keys with File, named "BRUSHES" |
| 5) Browse/Print Screens | Dump to Epson type printer |

3.1 LOAD PAINTBOX II

The selection of this option will result in the main drawing program of PAINTBOX (NEWBOX) being loaded and run.

Cassette users will need to cue the tape to the NEWBOX file and START the recorder if not under computer motor control. A prompt to do this will be given.

3.2 CHANGE DIRECTION KEYS

The selection of this option will result in a sequence of left, right, up, down key prompts being given in turn. The preferred key should be entered and confirmed at each stage. Keys already used are listed and not available for selection. Any attempt to select one will result in an *invalid* key message. After completing the sequence, the Option Menu is re-entered. The keys chosen will remain in use for the rest of the session.

This option is provided primarily for Electron users, since their cursor keys are adjacent to the BREAK key which cannot be easily disabled. The choice of alternatives is one of personal preference.

3.3 DEFINE USER BRUSHES

The selection of this option will result in the brush definer program of PAINTBOX II (DEFINER) being loaded and run.

Cassette users will need to cue the tape to the DEFINER file and START the recorder if not under computer motor control. A prompt to do this will be given.

After loading a summary of instructions may be selected, (Answer Y for Yes) and the programs prompts for input. Using this program lets you change the Brush shapes which are available from the function keys in the drawing program when brush size 2 is selected. Using this brush editor enables any or all of these keys to be changed in sequence.

All of the existing brushes are displayed on the screen for reference, the one to be edited being marked by the arrow pointer. To change or edit any brush, answer Y for Yes to the prompt or to keep the brush answer N for No.

Use the Move keys to select the appropriate cell, then press SPACE and the chosen cell will illuminate. (Keys repeat and wrap around to make this quicker.) Unwanted cells may always be deleted individually.

When the brush is complete press RETURN to continue, or alternatively press '*' which clears the grid for a re-try. After a new brush has been defined, this may be checked for its usefulness by a 'Preview' plot on different grids. Press SPACE when prompted to return to the Editor where an option to keep this new brush or change it further will be given.

Any brush may be previewed by pressing RETURN before any changes are made. By holding down any key other than "Y" the brushes may be sequenced to the one required for editing.

3.3.1 SAVING BRUSHES

After all ten keys have in turn been selected you may then save them, (to filename BRUSHES), this will enable these same brushes to be reloaded on any later sessions of PAINTBOX using Menu Option 4.

Cassette users are prompted to provide a blank cassette for this purpose.

Disc users should note that the brushes are always saved to the same filename BRUSHES and should rename other wanted brush files appropriately. The alternative BRUSHES file supplied on disc is duplicated as S.BRUSHES for this reason.

If new brushes are defined, they will be already loaded and available for the current session. No further opportunity to save these will be given.

Cassette users will need to cue the tape to PAINTII file and *start* the recorder if not under computer motor control. A prompt to do this will be given.

3.4 LOAD FILED USER BRUSHES

The selection of this option will result in the file of PAINTBOX 'BRUSHES' being loaded as an alternative to the normal set, to be used later in the drawing program. After loading these brushes the Option Menu is re-entered.

Cassette users will need to cue the tape to the BRUSHES file and *start* the recorder if not under computer motor control. A prompt to do this will be given.

3.5 BROWSE/PRINT SCREENS

3.5.1 CASSETTE USERS

This program gives the ability to print any previously saved screens of PAINTBOX or PAINTBOX II. You will need to cue the tape to load PRINTER and start the tape recorder if not under motor control. A prompt to do this will be given. This program will then be loaded and run.

You may load any saved screen of PAINTBOX and then print it, by holding down CTRL and pressing P. The screendump provided is for an Epson MX80 or FX80 (or compatible) printer, and only works in Mode 2.

If your printer is not of this type see USING YOUR PRINTER notes (Section 3.6).

3.5.2 DISC USERS

The selection of this option will result in the browse program of PAINTBOX II (BROWSER) being loaded and run. This program gives the ability to browse or print any previously saved screens of PAINTBOX or PAINTBOX II. Mode 2 is assumed unless a file's directory is 0 or 1. The selected drive number should be entered (Numbers 0 to 7 for the benefit of Double Density System users with their extra logical drives).

The current Mode 2 screen may be printed by holding down CTRL and also pressing P. If your printer is not of an MX80 or compatible type see USING YOUR PRINTER notes that follow.

You may step onto the next screen after the delay or by pressing SPACE. Holding down SPACE scrolls the screen until all have been displayed when "THE END" is seen. This will also be the case if there are *no* PAINTBOX screens on a disc. Selection of another drive enables any

further screens to be browsed. Browser will not work with the Watford DFS.

3.6 USING YOUR PRINTER

This may be done from the Option menu as above or at any other time using your print routine and loading either program PRINTER or BROWSER appropriately.

Both of the programs PRINTER and BROWSER use a CALL to address &2900 to execute the PAINTBOX II print routine. If your printer is not of the type supported by the Printer screen dump supplied, you may still use these programs to print your screens by either assembling your print routine to locate at this same address, or alternatively by putting a JUMP instruction at &2900 to point to your particular print routine. (Note that this will need to have a return RTS instruction if you want to repeat the process), and then *RUN the relevant program. Use *RUN PRINTER for cassette or *RUN BROWSER for disc.

For example should your printer dump be at &900, then use:

?&2900=&4C <RETURN>	JUMP
?&2901=&00 <RETURN>	&00 (LSB)
?&2902=&09 <RETURN>	&09 (MSB)

and then *RUN the appropriate program PRINTER or BROWSER.

If you have a priority printer dump program such as Computer Concepts' PRINTMASTER, another alternative is to use the program LOADER supplied and add your preferred print option to it.

For example, for PRINTMASTER load "LOADER" and add the lines:

180 *GDUMP 0 2	print screen
190 *PCODE 12	form feed

3.7 USING PAINTBOX SCREENS IN YOUR OWN PROGRAMS

This same LOADER program supplied will enable a screen to be input, and can be included in your own programs. It is liberally REMarked to indicate the steps required. Note that PAINTBOX does not support flashing colours, and to give a clearer display the TV interface is turned off, as are the cassette messages to avoid any being written on your screen.

4. MAIN MENU QUICK REFERENCE

4.1 OPTION SELECTION (ACQUIRING)

The options available are indicated by cells in the menu area at the top of the screen.

An option is selected by moving the cursor to the required cell and pressing SPACE or the joystick button. This is known as 'acquiring' the option.

4.2 COLOURS

The colours black, red, green, yellow, blue, magenta, cyan and white, occupy the first eight cells on the Main menu.

Colours can be selected at any time, even during mid-function. The graphics characters to the right of the colour cells reflect the chosen colour, even though various cursors are drawn in white.

4.3 SIZE CELL

The size cell displays at various times:

- 1) . (DOT) indicating brush size 1
- 2) 2-8 indicating the brush size
- 3) V indicating a variable brush size

4.3.1 DOT - SIZE CELL

Re-selects the smallest brush (size 1) and is used for painting dots or fine lines. (See section 5.1.1.)

4.3.2 '2-8' - SIZE CELL

Re-selects the brush size indicated by the digit. (See section 5.1.1.)

4.3.3 V - SIZE CELL

Re-selects the variable brush size. (See section 5.1.2.)

4.4 SHAPE CELL

The shape cell displays at various times:

- 1) X For selecting screen co-ordinate display
- 2) X Indicating no brush shape
- 3) ~ For selecting any brush character
- 4) T,S,C,A Indicating brush shapes

4.4.1 X OPTION - SCREEN CO-ORDINATES

Co-ordinates can only be switched on and off if an X is showing (brush size 1 is selected). They are selected (or relinquished) from the X cell by acquiring TWICE in succession, and are displayed at the top-left of the screen when the cursor moves back into the drawing area.

4.4.2 X OPTION - SHAPE CELL

You will only see an X in this cell position with a brush size of 1. (The X indicates that the other brush shapes are not available at this time since brush size 1 is a pixel size point and is therefore too small to have any shape.)

If a brush size greater than 2 is selected the X on this cell will become a T, S, C, A or a character shape.

4.4.3 ~ OPTION - BRUSH SIZE 2

Brush size 2 only, enables character brushes to be used and initially shows a ~ (tilde) in this cell. To change the character, visit this brush cell and acquire, followed by the chosen Function key or text character.

Returning to the drawing area enables the chosen character to be used as the brush. Repeated plotting, (hold down SPACE), or individual plots of the shape indicated are available.

4.4.4 T, S, C, A - BRUSH SHAPES

Any brush size greater than 2 gives you access to the Triangle (T), Square (S), Circle (C), and Airbrush (A) brush shape options. Each one is selected by further acquisitions on this same cell, the current size being displayed in the adjoining cell to the left.

The Circle brush only is effected by the Outline/Fill option. A small 'c' indicates that the circle will appear in outline, and a capital 'C' that it will be filled.

4.5 / OPTION - LINE

In this option an "elastic-band" cursor previews the line to be drawn. You will first have to plot a point to act as the origin. The cursor will then be drawn either dotted or solid depending on whether the Outline or Fill option has been selected respectively.

Lines require two end-points to be defined. Further options are inhibited except COLOUR or OUTLINE/FILL changes until the line is finally plotted in the current colour.

4.6 TRIANGLE

An elastic-band cursor previews the triangle once an origin and the second point have been defined. The cursor will then be drawn either dotted or solid depending on whether the Outline or Fill option has been selected respectively.

Triangles require three corner points to be defined. Further options are inhibited except Colour or Outline/Fill changes until the triangle is finally plotted in the current colour.

4.7 RECTANGLE CELL

The rectangle cell displays at various times:

- 1) A solid or filled rectangle
- 2) Horizontal or vertical stripes

4.7.1 RECTANGLES

An elastic-band cursor previews the rectangle once an origin has been defined. The cursor will then be drawn either dotted or solid depending on whether the Outline or Fill option has been selected respectively.

Rectangles require two diagonally opposite corner points to be defined. Further options are inhibited except Colour or Outline/Fill changes until the rectangle is finally plotted in the current colour.

In Modes 0 and 1, solid rectangles are only drawn with a brush size of 1. Other brush sizes give shaded rectangles.

4.7.2 STRIPED RECTANGLES

This option is only available if you have selected the Fill option and have a brush size greater than 1.

Solid rectangles, horizontal stripes, and vertical stripes are selected and displayed by successive acquisitions in the rectangle cell. Striped spacing is proportional to the brush size selected, so to change the spacing of the stripes simply change the brush size. Variable spacing can be selected by using "V" brush size. (See section 5.1.2.)

4.8 O OR F OPTION - OUTLINE/FILL

This option selects whether triangles, rectangles and brush circle shapes, are drawn in Outline or Filled. For a line this refers to whether the line is dotted or solid.

A dotted "elastic-band" preview cursor confirms that the O (Outline) option is in use. A solid "elastic-band" preview cursor confirms that the F (Fill) option is in use.

4.9 E OPTION - ERASE

The ERASE cell is protected against accidental operation by requiring TWO consecutive selections to activate. The screen then clears to the current brush colour.

4.10 C OPTION - CHANGE TO SECONDARY MENU

'Change' is the rightmost cell option on both Main and Secondary function menus, and changes between them, when in the drawing mode.

If you are not using joysticks, the CORNER keys (COPY on the BBC, DELETE on the ELECTRON) will quickly move the cursor to this cell to allow fast selection. Pressing RETURN will move the cursor back to the last drawing position.

5. SECONDARY MENU QUICK REFERENCE

5.1.1 1 2 3 4 5 6 7 8 9 - NUMBERS

These number cells and V (see below), define the brush size, grid size or stripe spacing (See 4.7.2). Their initial selection results in an automatic return to the main menu.

A brush size of 1 is indicated by a DOT in the size cell on the main menu, and an X to its immediate right (no shape).

A brush size greater than 1 is indicated by the digit in the size cell on the main menu.

A brush size of 2 will initially display a ~ (tilde) in the shape cell on the main menu and gives access to user-defined brushes (See section 4.4.3.)

A brush size selected greater than 2 will initially display a T in the shape cell. (See Section 4.4.4.)

After other options have been used, re-selection of this same brush size is readily available by returning to the SIZE cell on the Main menu at any time.

5.1.2 V OPTION - VARIABLE BRUSH SIZE

If you wish to declare a size of brush that is not available under sizes 1 to 8, then this cell gives rise to a Variable sized brush.

The size of the brush is defined by the x co-ordinate length of the last LINE option plotted.

To change or re-define the variable brush size:

- 1) Acquire V from the secondary menu
- 2) Select the Line option
- 3) Plot a horizontal line whose "x" component is of the required length
- 4) Acquire V from the size cell on the Main menu

If you do not want to display the line, select the colour to be the same as the background colour, and ensure GCOL 0 is selected.

5.2 G OR # OPTION - GRID

The Grid option allows you to move the cursor in discrete steps, of which you can choose the size.

The Grid option is initially *off* and a G is displayed in the grid cell. When selected a # is displayed in its place, and a digit to its immediate right indicates the current size. The step size can be changed using the numbers 1-8 or V which represents 9.

Since the use of the numbers 1-8 to select grid size takes priority over the use of the numbers to select brush size, the grid option must be de-selected before brush size can be selected again.

5.3 JOYSTICK OR KEYBOARD CELL

This cell displays at various times:

- 1) J/K Indicating the current mode of cursor control (Joystick or Keyboard).
- 2) 1-9 Indicating the current grid size (See section 5.2).

5.3.1 J OR K OPTION

This cell indicates the current mode of cursor control, and is used to select between the two. If the Grid option is in use it must be de-selected before the J/K option can be used.

5.4 TEXT CELL

The text cell can be used at various times to:

- 1) Display text on the screen
- 2) Change to another mode
- 3) Change the colour palette in Modes 0 and 1

5.4.1 TEXT OPTION - DRAW TEXT

On selecting the Text option, the colour palette reappears to allow colour selection at any time.

Move the cursor to the required position and acquire. The cursor will disappear indicating that the character (which may be a function key brush character), can be input. Repeat the process as many times as is necessary.

Pressing RETURN instead of a character will eventually display the cursor without any text being printed.

5.4.2 TEXT OPTION - CHANGE MODE

Select T, move into the drawing area and press SPACE. Rather than press a character (to print a letter), press CTRL.

The prompt 'Enter Mode 0,1,2 (2)' appears with the current mode in brackets. Press the number of the mode you require.

The number of colours and resolution in each mode is:

	COLOURS	RESOLUTION
MODE 0	2	640x256
MODE 1	4	320x256
MODE 2	8	160x256

5.4.3 TEXT OPTION - CHANGE COLOUR PALETTE

This option only works in Modes 0 and 1. Move to the T cell and acquire. Select from the colour cells the colour you wish to change. Move to the cell with the small square to the left of the grid cell, and press Space to cycle through the colours.

5.5 I OPTION - INFILL

Move into a completely bounded area and press SPACE or the fire button to start filling in the currently selected colour. The fill in progress may be stopped by pressing the SHIFT key in both Joystick and Keyboard input modes.

An "extended" colour palette is also available. Initial colour selection gives access to the usual choice of non-flashing standard colours. A second choice from the colour cells mixes the new colour on alternate lines. Colour re-selection is always available, and the actual fill colour(s) is shown in the ninth cell.

Infill mode is turned off by making another selection, even I. This results in a return to the Main option menu, and the displayed brush will be selected automatically.

5.6 S OPTION - SAVING THE SCREEN

The SAVE cell is protected against accidental operation in that two SPACEBAR pushes are required to select it.

If no name is given for the file, the default name "SCREEN" is used.

After saving, control returns to the Main menu with the displayed brush selected.

Disc users will find that the current mode is automatically appended to the directory. For example, saving a program in mode 1 called "name" will appear as "1.name".

5.6.1 ESCAPE OPTION - LOADING A SCREEN

To load a picture, press ESCAPE and answer 'Y' to the resulting prompt. If no name is given for the file, the default name "SCREEN" is used.

Disc users will find that the current mode is automatically appended to the directory of the filename. For example, loading a picture in mode 1 called "name" will in fact load "1.name". The Acorn DFS will allow you to override the designated mode directory. For example, to load a picture called "name", enter "\$.name".

5.7 GCOL OPTIONS (0-4)

The GCOL option has an identical effect to the Basic command of the same name.

- 0 Plot the colour (Default)
- 1 OR the colour with that already there
- 2 AND the colour with that already there
- 3 EOR the colour with that already there
- 4 INVERT the colour already there

The results obtained are explained more fully in the USER GUIDE.

5.8 C OPTION - CHANGE TO MAIN MENU

Results in a return to the Main Function Menu.

6. SPECIAL FEATURES

6.1 REPOSITIONING THE DISPLAY (BBC Version Only)

Should the Menus be obscured by screen cut-off, the display may be moved up or down by one line using the commands:

*TV 1 to move up

*TV 255 to move down

before PAINTBOX II is loaded.

6.2 SECURITY

Control codes can be stored in filenames using the | character. For example, the filename

|UFRED

will not appear properly in catalogues, and only users with the knowledge of the correct character sequence will be able to gain access to the file.

This will only work with some filing systems.

7. APPENDIX

7.0 USE OF KEYBOARD

The keyboard is always used for inputting characters when text plotting, or to supply a filename during filing operations.

- 1) Move keys default (BBC Micro) Cursor keys
 (Electron) L - Left, R - Right,
 P - Up, . - Down

If more than one key is pressed, the combination move results. (The keys may be redefined. See section 3.2.)

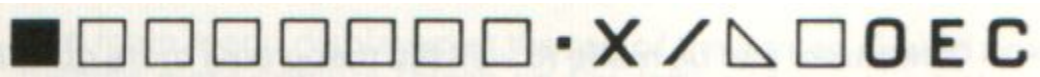
- 2) <SHIFT> + Move keys Results in larger move steps until the picture boundary is reached.
- 3) <CTRL> + Move keys Pixel step size, for precise control.
- 4) <COPY> (BBC) Moves immediately to "C" cell on menu.
 <DELETE> (ELK) (These are both "Corner Keys")
- 5) <RETURN> Returns to last on-screen position.
- 6) <SPACE> Acquires. (Equivalent of FIRE button.)
- 7) FUNCTION KEYS Are defined character brushes. Use <SHIFT>
 (f0-f9) or <CTRL> or <SHIFT>+<CTRL> with the
 function keys to reveal more. (BBC only.)
- 8) J/K Selects Joystick or Keyboard as input.
- 9) <SHIFT> Fill Ends FILL. (Keyboard and Joystick.)

Note: <RETURN> means press the Return key etc.

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