

## Loading Neil Huggett's "BigArt" programs:

1. Extract archive of 4 BART programs (they do not have suffixes), and place them where either a real Vic-20 (or emulated Vic-20) can access them (should work for all recent WinVICE versions).

The files are:

**BARTPREP** - a short VicBASIC program that sets up the memory in the Vic-20 for where **BASIC** will be contained, and for where the real screen will be located.

**BART3K** - block of machine code routines that will reside in the bottom 3K memory block.

**BARTMC** - large block of machine code routines that reside in memory block 2 (I think).

**BARTBASIC** - a VicBASIC program that will run the BigArt programs, and allow the user to change certain parameters, such as the colour of the border, the aspect ratio of drawn circles, etc.

2. Vic-20 computer (or emulated Vic-20) needs to have full memory blocks (0/1/2/3/5). (Actually, I can't be sure, but I don't think block 5 is used for my 'BigArt' programs.)

*In the following descriptions, I have tried to firstly specify the keys as they were on my **real** Vic-20 computer, even though I no longer have it. Where appropriate, I have also included alternatives that I have found when using WinVICE on my PC, with a full PC keyboard attached, and with WinVICE using a default **positional** keymap.*

3. Power up the Vic-20. It should say "**28159 BYTES FREE**".
4. Type on Vic-20: **LOAD"BARTPREP",8** and press 'RETURN' key. This should find the program and load it in. The command using '**,8**' assumes the Vic-20 is 'connected' to a diskdrive identified as 'drive 8' - if using WinVICE, you may need to configure peripherals, and under 'drive 8', to use 'Directory', and set the path to where my BART files are sitting. Depending on the Vic-20 configuration you are using, you may need to modify the load commands. Eg. **LOAD"BARTPREP",9**

If the program loads okay, you can **LIST** it, to see what is in it.

5. Type on Vic-20: **RUN** and press 'RETURN' key. This will run the BASIC program, and clear itself. It will set up the new location for any BASIC programs, as well as the location of the screen.
6. Type on Vic-20: **LOAD"BART3K",8,1** (notice the extra '**,1**' after the **8**) and press 'RETURN' key. The extra '**,1**' will load the file into the location specified in the start of the file itself - the bottom 3K block.
7. Type on Vic-20: **NEW** and press 'RETURN' key. This should clear any strange inclusions in the BASIC memory area.
8. Type on Vic-20: **LOAD"BARTMC",8,1** (notice the extra '**,1**' after the **8**) and press 'RETURN' key. The extra '**,1**' will load the file into the location specified in the start of the file itself.
9. Type on Vic-20: **NEW** and press 'RETURN' key. This will clear any strange inclusions in the BASIC memory area.
10. Now type on Vic-20: **LOAD"BARTBASIC",8** (do not add the extra '**,1**' after the **8**) and press 'RETURN' key. This will load the BASIC program into the Vic-20 in the BASIC program location. You should be able to **LIST** the program, and explore it at will.
11. If using WinVICE, you may want to take a snapshot at this stage, with locations set, and machine code routines in place. You can then easily go back to this stage in the future, without needing to go through all of the loading procedures.
12. Type on Vic-20: **RUN** and press 'RETURN' key. After processing some BASIC code, the computer will show the 'BigArt' program running. You should see a 'high resolution' graphics screen with 2 cursors on it, a

bigger one (Cursor A) and a small one (Cursor B). Note that this 'high resolution' graphics screen is actually only showing the top left-hand quarter of the whole of the big graphics screen that my '**BigArt**' program uses. More about that later.

13. There is likely to be some 'rubbish' on the screen from any resident values in the memory I am using for the big graphics screen. When the program runs, it deliberately doesn't clear the big graphics screen. This is so you can work on an image, and jump back out to BASIC, and then save the big graphics screen, or maybe load a different BASIC program that may do something else to the big graphics screen, without it changing the stored big graphics screen in between jumping out to BASIC, etc. Of course, if you restart the Vic-20, or reset it, you will lose any image stored in the big graphics screen.

Clear the big graphics screen by pressing the '**SHIFT**' + '**HOME**' keys. You should see all of the screen go white, with just the 2 cursors drawn there, ready for action.

14. You can hide both cursors, by pressing '**SHIFT**' + '**K**' keys. You can show both cursors again by pressing just the '**K**' key. The cursors are drawn over the top of the big graphics screen without modifying it at all, using a special mode of drawing called 'exclusive-or' (as each pixel is drawn, if the pixel underneath it on the big high resolution screen is white, the cursor is drawn with a black pixel, and if the pixel underneath it on the big high resolution screen is black, the cursor is drawn with a white pixel). Hopefully this will make more sense when you move the cursors over some sort of image.
15. Only one cursor can be moved at a time. You can see which is the **active** cursor, by pressing the '**K**' key. This will hide just the **inactive** cursor. Press the '**K**' key again to show both cursors. You change which cursor is active, by pressing the '**F7**' key.
16. You move the active cursor, by pressing keys like a keypad, as if the '**S**' key is the centre. For example,

Pressing the '**W**' key will move the active cursor up by one pixel.  
Pressing the '**X**' key will move the active cursor down by one pixel.  
Pressing the '**A**' key will move the active cursor left by one pixel.  
Pressing the '**D**' key will move the active cursor right by one pixel.  
Pressing the '**Q**' key will move the active cursor diagonally up and left by one pixel each.  
Pressing the '**E**' key will move the active cursor diagonally up and right by one pixel each.  
Pressing the '**Z**' key will move the active cursor diagonally down and left by one pixel each.  
Pressing the '**C**' key will move the active cursor diagonally down and right by one pixel each.

(I am pretty sure, you can also move the active cursor by using an attached joystick.)

Note that you are moving the cursors over the **big graphics screen**, and not just over the **small** graphics screen (which only shows part of the big graphics screen). It is possible to lose sight of one or two of the cursors, but they will be there somewhere.

17. After a little exploring of moving the cursors, move the two cursors back to close to where they started, and leave the larger cursor as the active cursor. Now press the '**C**' key about 20 times, to move it diagonally down and to the right. Now press the '@' key (just to the right of the '**P**' key, if using a real Vic-20, or the '[' key if using WinVICE), and wait a few seconds. You should see a circle drawn on the screen, with the large cursor at the circle's centre, and with the smaller cursor on the edge of the circle. Please note that everything is happening here using machine code routines. The circle draw routine requires a lot of processing, and it takes time, but it does look good. You can change the aspect ratio used for any future circles drawn, and whether you draw an outline or a filled circle, but those can be explored later (by pressing '**SHIFT**' + '@' keys; or '**SHIFT**' + '[' keys if using WinVICE).
18. Press the '**L**' key to draw a line between both cursors. The line drawing routine draws a line between 2 points each defined using X and Y values specified using 2 bytes each (ie. 2 bytes for the X value of point 1, 2 bytes for the Y value of point 1, 2 bytes for the X value of point 2, and 2 bytes for the Y value of point 2). In fact, all the graphics routines developed for this '**BigArt**' system (like the circle draw routine) use X and Y values specified using 2 bytes each. It is necessary for drawing to a screen of 320 x 352 pixels!

Press '**SHIFT**' + '**K**' keys to hide the cursors. Press the '**K**' key again to show both cursors.

19. Clear the screen by pressing '**SHIFT**' + '**HOME**' keys.
20. We want to draw a large circle that will take up most of the **big graphics screen**. Make sure the **large**

**cursor** (cursor A) is **active** (press the '**F7**' key if it is not) and move it to the bottom right corner of the graphics screen you are looking at.

21. Press the '**F7**' key to make the small cursor **active**. Move the small cursor (cursor B) to the bottom left corner of the graphics screen you are looking at. Now use the '**D**' key to move the small cursor back towards the large cursor about a third of the way across the bottom of the small graphics screen.
22. Now to draw the circle, press the '@' key (or '[' key), and wait for the circle to be drawn.
23. You should see the top left-hand quarter of the circle. This is because we are only viewing the top left-hand quarter of the big graphics screen. Press the '**2**' key (above the '**W**' key). You should now see the top centre of the circle.
24. Press the '**3**' key (above the '**E**' key). You should now see the top right quarter of the circle, on top right quarter of the big graphics screen.  
Press the '**7**' key (above the '**U**' key). You should now see the bottom left quarter of the big graphics screen.  
Press the '**9**' key (above the '**O**' key). You should now see the bottom right quarter of the big graphics screen.  
Press the '**5**' key (above the '**T**' key). You should now see the centre of the big graphics screen, and all you will see is the large cursor near the centre.  
In fact, the number keys (1, 2, 3, 4, 5, 6, 7, 8, and 9) move the 'viewing box' (that is the small graphics screen) methodically (left, middle, right) across the big graphics screen using 3 rows (top, middle, and bottom). Please explore.
25. Press the '**0**' key (above the '**P**' key) to get a 'sampled view' of the entire big graphics screen. This can be very handy to check overall positioning of a graphic, etc. To return to the 'normal' (or 1:1) editing view, press the '**RETURN**' Key.
26. Press the '**1**' key (above the '**Q**' key). You should now see the top left quarter of the big graphics screen, as seen when the program first started.
27. You can also use the '**cursor**' keys to move the viewing box around over the big graphics screen using smaller increments of movement. Note that you cannot move the viewing box beyond the extremities of the big graphics screen.
28. Now I want to show you the **Magnify mode**. Press the '**1**' key (above the '**Q**' key). You should now see the top left quarter of the big graphics screen, as seen when the program first started, along with the top left quarter of the large circle. Move the **active** cursor to somewhere in from the edges of the screen, but near (or on) the edge of the circle.
29. To go to the Magnify mode, press the '**M**' key. You should now see a closeup of the screen around the active cursor, where individual pixels are shown as large blocks. You should also see a flashing asterisk character. This is the position of the active cursor. You can move the cursor using the same keys as before (ie. '**Q**', '**W**', '**E**', '**A**', '**D**', '**Z**', '**X**', and '**C**' keys). However, the cursor will always stay within the bounds of the closeup screen shown. Note that sometimes, the flashing of the cursor can make it difficult to see. You can move the position of the closeup screen by using the '**cursor**' keys. Experiment with moving the closeup screen around over the drawing of the circle. As the closeup screen moves, it takes the cursor with it.
30. Move the flashing cursor towards the centre of the closeup screen, but in an area that is white. Press the '.' key (full-stop key). This will change one pixel from white to black. Use the '**Q**', '**E**', '**Z**' and '**C**' keys to move the cursor position diagonally, and press the '.' key to make a simple pattern of pixels.
31. It is probably useful to let you know that there are 3 modes of 'drawing' on the BigArt' screen:
  1. is the default which 'draws using **black**' or changes any white pixel to **black** as things are 'drawn'. Press the '+' key (just to the right of the '**0**' key; if using WinVICE it will be the '-' key on the PC keyboard) to enable this mode of 'drawing';
  2. is to 'draw using **white**', or changes any black pixels to **white** as things are 'drawn'. Press the '-' key (just to the right of the '+' key; if using WinVICE it will be the '=' key on the PC keyboard) to enable this mode of 'drawing';
  3. is to 'draw using the **opposite colour**' to what is there, or called '**exclusive or**'. Press the 'X' key (just to the right of the '-' key; if using WinVICE it will be the '**INSERT**' key on the PC keyboard) to enable this mode of 'drawing'.

You can change modes when in the **Magnify mode** as well as any time while in the **'normal' (or 1:1) editing view**.

32. To exit **Magnify mode**, press the **'RETURN'** key. You should now be back in the **'normal' (or 1:1) editing view**. You should see all of the changes to the screen that were made while in **Magnify mode**. The **active cursor** will now be situated where it was last shown when in **Magnify mode**. Chances are, the cursor will be obscuring the simple pattern made in **Magnify mode**. Press **'SHIFT' + 'K'** keys to hide the cursors. Press the **'K'** key again to show the cursors.
33. You can **exit** back out to **Vic BASIC** by firstly pressing the **'←'** key (or **'~'** key, just left of the **'1'** key, if using WinVICE). Doing this successfully will show a text screen asking you to change the Vic screen border colour. We are now back under the control of the BASIC program.

Now press the **'RUNSTOP'** key (or **'CAPS LOCK'** key if using WinVICE). You should see the flashing Vic-20 text cursor. If you are using WinVICE, it is good practice to press the **'CAPS LOCK'** key again, to turn **Caps off** on the PC keyboard.

34. You can now enter any **direct commands** you wish, using **Vic BASIC**.

**Other commands the BigArt program use include (there are others that are not in the records I found):**

**'F1'** key – draw continuously from the active cursor as you as you move it.

**'F3'** key – stop continuously drawing from the active cursor.

**'F8'** key – allows you to specify a grid to use for all cursor movements.

**'B'** key – draw a **block** (or filled rectangle) between the 2 cursors.

**'O'** key – draw a rectangular **outline** (or open rectangle) between the 2 cursors.

**'\*' key ('J' key if using WinVICE) – draw random lines within a rectangle defined by the 2 cursors.**

**'COMMODORE' + '\*' key (Left 'CTRL' + 'J' key if using WinVICE) – draw random lines over entire big graphics screen.**

**'.'** key (full stop key) – draw a **pixel** at the **active** cursor position.

**'R'** key – draw **random dots** within a rectangle defined by the 2 cursors.

**'SHIFT' + 'R'** keys – allows you to set the parameters used for random elements.

**'SHIFT' + '.' keys – allows you to set the size of 'dots', in integer multiples (eg. 2 times wide by 3 times high).**

**'SHIFT' + '@' keys ('SHIFT' + '[' keys if using WinVICE) – allows you to set the parameters for the circle draw routine.**

**'G'** key – Gets the rectangle of image defined by the 2 cursors.

**'P'** key – Puts the stored image that was collected from the last 'Get' and plots it from the **active cursor**.

**'T'** key – allows you to **type characters** (including text, numbers, and the graphics ones found on the real Vic-20 keyboard) to the screen from the **active cursor**. Best done using a real Vic-20.

**'SHIFT' + 'T' keys – allows you to set the size of the characters plotted to the screen, in integer multiples (eg. 2 times wide by 3 times high).**

**Note:** If you find it difficult getting the key combination for clearing the screen, drop out of the running **'BigArt program'** back to **VicBASIC**, and type: **POKE14107,206** and press the **'RETURN'** key. Then, to clear the big graphics screen when the **BigArt program** is running, will take pressing the **'SHIFT' + 'N'** keys (for **New** screen), instead of **'SHIFT' + 'HOME'** keys.