

Multipaint

Multipaint allows you to draw pictures with the colour limitations of some typical 8-bit computer platforms. The display formats supported are C64 high resolution, C64 multicolor, ZX Spectrum and MSX 1.

Multipaint is meant to encourage a way of creating 8-bit pixel images in direct dialogue with the colour limitations of the target platform. 8-bit visuals are often defined by a presence of a colour grid which is coarser than the actual pixel resolution which is quite low to begin with. Working with and around these limits often means trying out a variety of approaches as you go along.

With Multipaint, any changes that the current tool would inflict on the color grid are always visible as the action is done, just as it would be on the real hardware. All tools are intended to work directly with as few parameters as possible and to be relevant for 8-bit drawing.

The program is heavily influenced by Daniel Silva's original Deluxe Paint on the Amiga. A lot of the program behavior and many of the key shortcuts are derived from there.

Acknowledgments:

The Processing code was written by Tero Heikkinen.

The source makes use of Markku Reunanen's fileselector solution adapted from the excellent PETSCII editor.

A bin2tap file output from the Fuse package was the basis for the ZX Spectrum TAP export template.

The C64 palette was created by Philip "Pepto" Timmermann.

Supported target platforms

If you have stumbled here with no familiarity with 8-bit art, the C64 multicolor mode might be the best starting point as the color limitations are not as severe. If you need advice for 8-bit image-making there are many examples, tutorials and information for each of the platforms on the internet.

The program attempts to resolve the required color foreground/background internally as you go along. For the technically minded, the program appears to change or even lose internal picture information. For example, if a character area is drawn full with color red, it will be further on treated as an empty character of that background color.

The way Multipaint treats colours follows from the idea that when editing complex color graphics I cannot really remember whether a particular colour on screen is technically “background” or “ink”, so the program would solve this for me. I’ve done my best to make the drawing experience as simple and intuitive, but the platform characteristics cannot simply be ignored when drawing.

There are tricks for expanding the colour capabilities of these platforms, but these modes are not included in Multipaint at least for now.

Commodore 64 hires

The resolution is 320x200, with 40x25 character colour resolution. There are 16 proper colours to choose from. The border color can be selected from the 16, but there is no overall background color.

Commodore 64 multicolor

Here we have a lower 160x200 pixel resolution, where each 4x8 character area can hold three different colours+the overall background colour, which is uniform for the whole picture. The colours can be any of the 16.

The mode behaves a bit differently than the others. As is usual, the program resolves how the colours will be arranged internally for each of the characters, so for the most part you can just draw. When Multipaint notices a colour cannot be added to a character area, it simply refuses to add the pixels. Then you have to rethink the area.

ZX Spectrum

Pretty similar to the C64 hires, but the screen area is 256 x 192 pixels. The colour character grid is 32x24, with 8 primary video colors in two brightness variations. The black colour does not have bright variant, giving a total of 15 different colours.

A subtler limitation is that the brightness variations cannot be mixed inside the same character area. The exception is the colour black, giving rise to the primaries-on-black aesthetic that commanded many ZX Spectrum games.

The ZX Spectrum has a border colour which can be selected from the 8 low-brightness colors. There is no overall background color.

MSX1

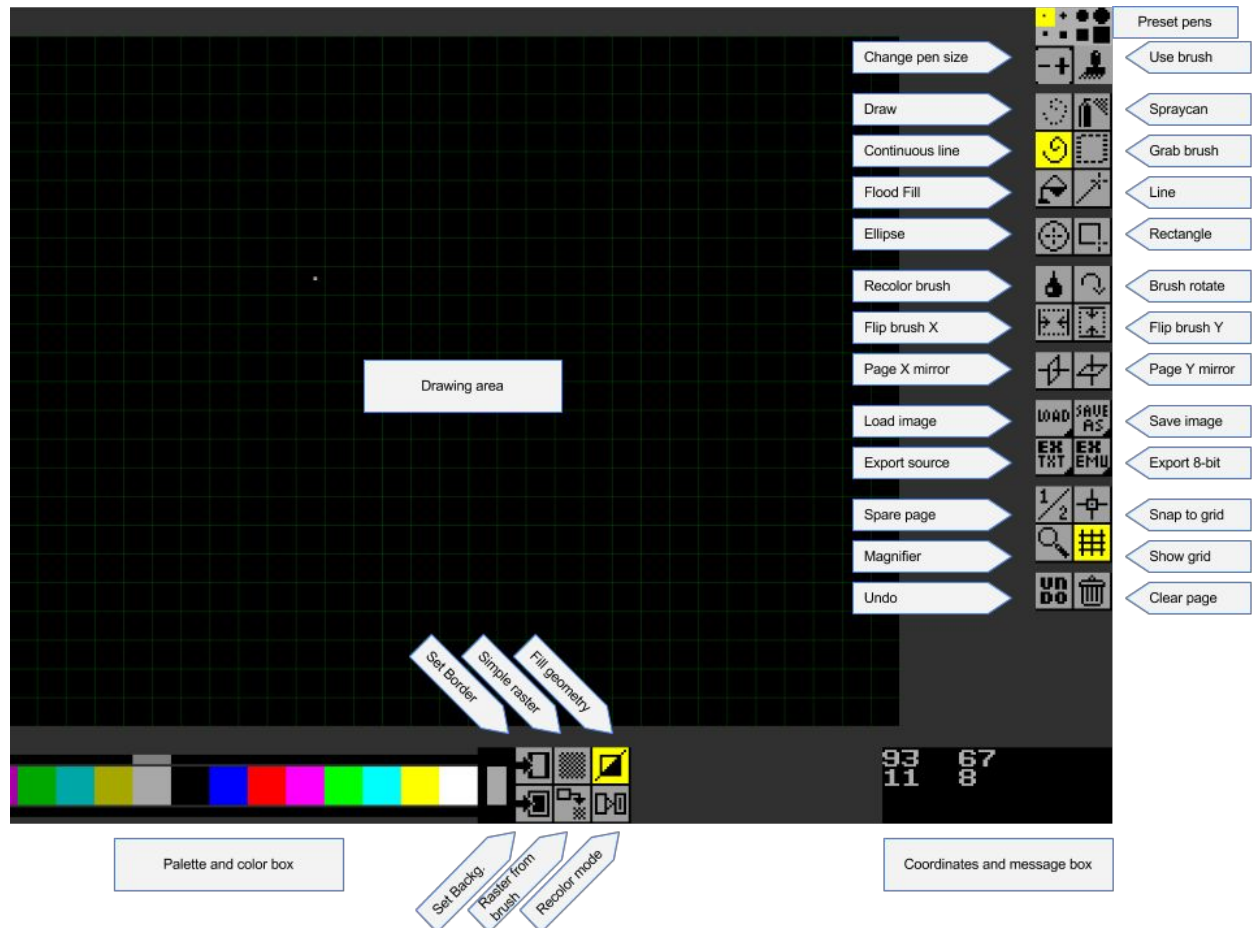
Just as with the ZX Spectrum, the screen area is 256 x 192 pixels. But here the colour grid is 32x192, which means all 15 colours can appear inside character area... as long as each horizontal line within the character area contains only 2 colours.

Although the situation is technically better than with the Spectrum, the MSX is a bit infamous for having a contrastless and redundant colour palette.

The MSX has an overall background zero-color, which also determines the border color. Therefore there seem to be two blacks in the palette to begin with.

Instructions

The screenshot below shows how all the tools are laid out on the Multipaint screen.



Following instructions list all the key shortcuts for the tools and actions in the program.

Note that for capital letter keys you need to press SHIFT+key to achieve the effect. For example "t" is simply the key t, whereas T is SHIFT+t.

Care has been taken that a laptop keyboard and other limited keyboards would be sufficient for using this program. The numeric keypad and function keys generally do nothing. Majority of actions are based on alphanumeric keys.

Mouse

A two-button mouse is required for this program to work fully.

In the drawing area:

Mouse Left button	Do tool action with selected color
Mouse Right button	Do tool action with secondary (background) color
(Middle mouse button)	Grab colour under the point as the selected color

Over the palette:

Mouse Left button	Choose color
Mouse Right button	Choose secondary (background) color

Over icons:

Mouse Left button	Command
Mouse Right button	Alternative Command (when appropriate)
Hover	View tooltip

Tools

These keys change the current tool.

1	Draw	Draws pixels
2	Continuous Line	Draws a continuous line
3	Spraycan	Draws a squiggle of random pixels
4	Grab Brush	Grab a rectangular section of the page as a brush
5	Flood Fill	Fill an enclosed area
6	Rectangle	Draw a rectangle
7	Ellipse	Draw an ellipse
8	Line	Draw a single line between two points
9	Use cut brush	Draw with the brush grabbed with (4)

As mentioned above the tools work differently with Left and Right Mousebuttons. With the Grab Brush (4) command this means the right button clears the grabbed area after the selection.

Given the nature of the 8-bit graphic modes it often makes sense to use the character grid constraint (c) when grabbing and drawing with brushes.

Geometry tools 4,6,7 and 8 require you to press mousebutton, drag mouse and release to finish the action.

The (9) Brush Draw command brings the grabbed brush back, if you are alternating between the preset (round) pens and the brush.

After grabbing a brush, brush-related switches will be reset for clarity.

Navigation keys:

Each of these switches affect the way the page is displayed:

g	Show grid on/off	Show the 8x8 grid. Useful for colour checking
m	Magnify on/off	3 x magnify on current pointer position
M	Extreme magnify on/off	8 x magnify on current pointer position
Up	Scroll up	Scroll magnified screen up
Down	Scroll down	Scroll magnified screen down
Right	Scroll right	Scroll magnified screen right
Left	Scroll left	Scroll magnified screen left

Universal switches:

These commands are called switches as they can be either on or off. Clicking the same icon, or pressing the same key, toggles the switch. You need to be aware which of the switches are on.

The following switches affect the tool actions:

c	Snap to grid on/off	Constrain actions to the 8x8 grid. Useful for brush actions.
X	Page X mirror on/off	Every action will be duplicated along central axis
Y	Page Y mirror on/off	Every action will be duplicated along central axis

An alternative for (c) is to hold down the SHIFT key during actions.

The mirror tools are a simple way to work with symmetry or bring out some unexpected results.

The following switches are drawing modes. They affect the way subsequent pixels are drawn:

f	Fill geometry on/off	Solid rectangle and ellipse commands. Default:on.
d	Recolor mode on/off	Change instances of secondary color to primary color
r	Simple raster on/off	Draw with a checkerboard pattern.
R	Brush pattern on/off	Draw with a brush-derived pattern.

The recolor(d) tool is important for the low attribute modes (Spectrum, C64 Hi resolution and MSX). In (d)-mode, the selected secondary (background) color will be used as a “from”-colour, whereas the selected left button color will work as a “to”-colour. For example, the background might be red and the foreground blue. Drawing filled rectangles over areas will not create new pixels, but change any existing red-colored areas to blue.

The recolor tool works somewhat differently in the C64 Multicolor mode, it will act as a pixel-level stencil for the selected color.

The (R) brush pattern mode requires that a brush is created with the grab brush tool 4. This works best if the pattern is simple and monochromatic. The secondary (background) color acts as transparency.

Pen/brush commands and switches:

h	Reduce pen size	
H	Increase pen size	
.	Pixel-sized pen	Revert to 1-pixel size drawing at any point.

The above commands change the current pen size. You can also select two varieties of pen from the top right corner of the screen, circular or rectangular.

The . key reverts to a one-pixel size drawing tool 1 in any situation.

The following switches affect the grabbed brush and are only visible when drawing with the brush tool (key 9).

x	Flip brush horizontal	
y	Flip brush vertical	
z	Rotate brush clockwise	
p	Recolor brush	Draw brush with selected color instead of brush colors

Note that the brush size cannot be larger than the platform screen size.

Direct commands:

The following commands have an immediate effect.

u	Undo	Undo last action
U	Redo	Redo action (10 steps)
j	Spare page	Switch between back spare and front page
B	Set Border color	Make current color Border color (not in MSX1)
C	Set Background color	Make current color Background in C64 multicolor/MSX1
s	Save As	Save current page with a new filename
S	Save	Overwrite existing file with current filename
l	Load page	Load file into the current page
E	Export emulator	Export the page as an emulator file
,	Grab color	Switch color to one underneath the pointer
<	Invert colors	Swap left mousebutton/right mousebutton color

The files can be saved in the .bin format, or alternatively as a .png image file. You can also load .png or .jpeg files, which will be simply converted into the current platform color and resolution limitations.

The E Export emulator key outputs a different kind of file depending on the current platform.

C64: Multipaint outputs a PRG file, which can be loaded into VICE C64 emulator. If you want to transfer the file to a real C64 it should run happily there.

Spectrum: Multipaint outputs a TAP file, which can be loaded into Fuse Spectrum Emulator. If you use TAP2WAV utility, you can play the output audio to a real Spectrum. Some hardware allows you to load TAPs directly into a real Spectrum, too.

MSX: Multipaint outputs a COM file, which is an executable for MSX-DOS.

The spare page key switches between two different pages, so you can rapidly edit and move elements between two different images in the same session. With Multipaint, you cannot hold more than two files “open”. The two pages have their own undo buffers and filenames, so saving the front page does not overwrite the other file.

Additional key commands

The following keyboard commands are mostly added to provide some comfort for those who expect typical key shortcuts. There are also some actions that are not directly doable otherwise.

CTRL+Z	Undo
CTRL+Y or CTRL+SHIFT+Z	Redo
CTRL+A	Select whole screen as a brush and set tool 9.
CTRL+C	“Copy” Set tool (4) grab brush
CTRL+V	“Paste” Set tool 9
CTRL+S	Save current page
CTRL+N	Clear page

Some tips

It is recommended you become familiar with the ‘d’ (recolor) mode, especially with low-attribute modes such as the Spectrum, C64 high resolution and MSX. Otherwise you may find you have less control over the colors.

Large brushes are likely to become very slow with continuous line and the geometry tools.