C256 – Developer Introduction Notes

# Introduction to the C256 System

The C256 system uses a 65C816 micro-processor.

System clock is 14MHz.



# Git Repositories

Nu256 Emulator: <https://github.com/tomxp411/Nu256.git>

C256 Kernel: <https://github.com/Trinity-11/Kernel>

# Tools

To modify the Nu256 Emulator, you will need Visual Studio 2017 Community edition.

The emulator is written in C#.

# Memory Map

The CPU can access 24-bit worth of addresses.



|  |  |  |
| --- | --- | --- |
| $FF:0000 - $FF:FFFF | Page $FF | **16 MB Address Space** |
| $FE:0000 - $FE:FFFF | Page $FE |
|  |  |
|  |  |
|  |  |
|  |  |
| $00:0000 - $01:FFFF | Page $01 |
| $00:0000 - $00:FFFF | Page $00 |

The address space is mapped as follows:

|  |  |
| --- | --- |
| $F8:0000 - $FF:FFFF | 512 KB User Flash (if populated) |
| $F0:0000 - $F7:FFFF | 512 KB System Flash |
| $B0:0000 - $EF:FFFF | 4 MB Video RAM |
| $AF:0000 - $AF:FFFF | IO Space |
| $40:0000 - $AE:FFFF | <empty> |
| $20:0000 - $3F:FFFF | 2 MB RAM (optional) |
| $00:0000 - $1F:FFFF | 2 MB RAM |

On boot, Gavin copies the first 64KB of the content of System Flash (or User Flash, if present) to Page $00. The entire 512KB are copied to address range $18:0000 to $1F:FFFF.

IO Space is mapped to Vicky: $AF:0000 to $AF:DFFF and Beatrix: $AF:E000 to $AF:FFFF.

## Gavin – Location $00:0000 to $00:FFFF



## Vicky – Location $AF:0000 to $AF:DFFF



### Screen Page 0 – Location $AF:A000

One page of text is 128 columns by 64 rows. This adds up to 8 KB of memory of text. C256 does not display the entire buffer on the screen. Typically, we render 72 characters per row, with 56 rows.

This uses 576 x 448 of the available 640 x 480 resolution. The border size can be modified or turned off completely.

### Screen Page 1 – Location $AF:C000

An addition page of 128 x 64 is used to store the colors. Each byte is split into background (4bits) and foreground (4 bits).

The colors used (the 4 bits) are used to lookup RBG values in two lookup tables (LUT).

The foreground (FG) LUT is located at $AF:1F40 for 64 bytes – only 16 x 3 = 48 bytes are used.

The background (BG) LUT is located at $AF:1F80 for 64 bytes – only 16 x 3 = 48 bytes are used.

The colors are assigned 8 Bit - Red, 8 Bit - Green, 8 - Blue for each of those colors in Text Mode.

## Beatrix

