Commander X16 Features & Specs

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This document will be kept updated with the latest specifications of the product:

CPU

- WDC 65x02 @ 8 Mhz
- 40-pin DIP package
- (Protoype board currently running stable at 2 Mhz. Steps are being taken to stabilize it at 8 Mhz. Worst case if all issues are not solved, the final board could be 4 mhz, but still planning for 8)

RAM

- 40K of "Low RAM"
- 512K of "High RAM" standard
- Expandable to 1 MB, 1.5 MB, or 2 MB by adding additional RAM chips to 3 empty sockets.

ROM

- 128K of Flash ROM
- Standard Commodore Kernal
- Microsoft BASIC version 2.0
- Machine Language Monitor
- Can be reflashed from the computer

Expansion

- Four expansion slots with access to CPU databus
- Each slot has its own 32-bytes of mapped RAM
- 8 general-purpose I/O lines available (user port)

Input Devices

- PS/2 Keyboard
- PS/2 Mouse
- Two NES or SNES style game ports (dev board just has pin headers)

Storage

- IEC compatible disk drive port
- Internal SD-2-IEC with SD card slot (on final board only, not dev board)

Audio

- Audio is still being determined. There are 3 designs being considered and tested at the moment including a Yamaha YM2151, a SAA1099, and a SID-like implementation in the video chip's FPGA. Which will ultimate work best is yet to be determined.

"Vera" Video chip specifications

- 128K of internal video RAM
- 640x480 @ 60 Hz analog VGA output
- 640x240 Composite video and/or S-Video output.
- Option to disable color signal for sharper grayscale text/graphics on composite monitors.

Text Modes:

- 80x60, 40x30, and 20x15 character modes
- 8x8 pixels characters with PETSCII font
- 16-colors with independent fore/background colors for each character
- 256-color text mode with global background color.

Two Independent graphics layers, each capable of:

- pixel scaling: 1x/2x/3x/4x for width and height
- tile size: width 8/16 pixel, height 8/16 pixels
- tile map size: width 32/64/128/256 tiles, height 32/64/128/256 tiles
- tile modes:
  - 1 bpp (bits per pixel) with per-tile 16-color foreground/background color, 8 bit tile index (16 color text mode)
  - 1 bpp with per-tile 256-color foreground color, background color is always index 0 (transparent), 8 bit tile index (256-color text mode)
  - 2/4/8 bpp with per-tile h-flip, v-flip, 4-bit palette offset, 10 bit tile index
  - all these modes support smooth scrolling
- bitmap modes:
  - 1/2/4/8 bpp
  - 4-bit palette offset
  - these modes don't support scrolling to save on memory
- the 1 bpp tile modes in combination with 8x16 tile size will also allow for a standard VGA font to be used