creatiVision Emulator
User Documentation
16.04.24

Introduction

The VTech creatiVision was a hybrid home computer and games console, circa 1981.

It was sold under various branding, dependent upon location. These included Educat 2002, Dick Smith Wizzard, FunVision, Hanimex Rameses and VZ2000.

The console contained a Rockwell 6502 CPU clocked at 2MHz, 1KB of RAM and 16KB of Video RAM. Video was provided by a Texas Instruments TMS9929/9918, with a resolution of 256x192 pixels, 16 colours and 32 sprites. Sound is produced with a Texas Instruments SN76489, three tone channels and one noise channel.

There were two integrated joystick / membrane keypad controllers which when placed in the compartment, could be used as a normal keyboard.

Using the emulator

Before using the emulator, you should place your bios file in a sub-directory called BIOS. Any roms you wish to play should be in a sub-directory called ROMS.

Command line options

-h This will show the available switches and in-emulator function keys.

-b Load an alternate bios. By default, the emulator will look for bios/bioscv.rom in creatiVision mode, bios/cslbios.rom in CSL mode or bios/saloram.rom in Salora Manager mode.

-r Load an alternate rom. By default, the emulator will load roms/cart.bin. You can specify the name of another rom with this option.

-m This will provide magnification. The default is x2, or 544 x 416, but can be magnified up to 4x.

-f Use fullscreen mode. This will retain the 4:3 aspect ratio.

-s Use low quality sound. By default the emulator outputs at 44.1KHz, however it will drop to 22Khz. This switch is not available on the Raspberry Pi, as it always outputs at 48KHz.

-l Load cassette program in fast mode. This only works in creativision mode, and is useful for faster loading and saving of BASIC83 programs. It does not work with BASIC82.

-c Set name of CSAVE/CLOAD file. By default it will be CSAVE.CAS

-p Set name of PRINT file for LPRINT/LLIST. Default PRINTER.TXT

-2 Set CSL cartridge emulation mode.

-3 Set Salora Manager / Laser 2001 emulation mode.

-k Enable VPOKE patching for CSL / Salora mode. This is required for some BASIC listings

-n Network Player number. Must be 1 for server, 2 for client.

-i IP Address of server. Required for –n 2.

-e Floppy disk image to load in Salora mode. Default floppy.bin

Developer command line options

-t Use in-built debugger.

-v Enable VDP register dump via function keys.

-d Record a demo to AVI. Warning, these are stored completely uncompressed and can result in huge files.

-g Load ROM linear. By default the emulator loads roms in a compatible manner to previous emulators. However, this is completely incompatible with development tools. To overcome this, -g loads the rom into memory, ending at $C000.

Function keys

F2 Pause game play
F3 Press Reset
F4 Rewind cassette tape
F5 Take PNG picture
F7 Save snapshot
F8 Load snapshot
F10 Dump RAM and VRAM
F11 Disable VDP tracing
F12 Stop / Start VDP tracing

Keyboard mapping

The PC keyboard maps alpha-numeric keys as expected. However, notice that the top row is slightly different to the PC keyboard.

Also, you will find the plus sign as shift+semi-colon.

Joysticks are mapped as

Player one uses cursor keys, and ctrl and shift. Player two uses HOME, DELETE, END and PAGE DOWN as cursors, INSERT and PAGEUP as buttons.

Additional Keyboard mapping in CSL and Salora Manager mode

CNTL-Q	**CSAVE**	CNTL-Z	**BLOAD**
CNTL-W	**CLOAD**	CNTL-X	**BRUN**
CNTL-E	**CRUN**	CNTL-C	**BREAK**
CNTL-R	**PEEK**	CNTL-V	**LLIST**
CNTL-T	**POKE**	CNTL-B	**LPRINT**
CNTL-Y	**VPEEK**	CNTL-N	**SOUND**
CNTL-U	**VPOKE**	CNTL-M	**SGEN**
CNTL-I	**CALL**		
CNTL-O	**RUBOUT**	SHIFT-LEFT	**UP**
CNTL-P	**INSERT**	SHIFT-RIGHT	**DOWN**
CNTL-A	**HOME**		
CNTL-S	**TEXT**	CNTL-1	**[or Ä**
CNTL-D	**GR**	CNTL-2	**] or ä**
CNTL-F	**COLOR=**	CNTL-3	**\ or ö**
CNTL-G	**PLOT**	CNTL-4	**{**
CNTL-H	**UNPLOT**	CNTL-5	**}**
CNTL-J	**RECT**	CNTL-6	**|**
CNTL-K	**CIRCLE**	CNTL-7	**~**
		CNTL-8	**'**

Joystick in CSL mode - HOME, DELETE, END and PAGEDOWN as cursors, left CTRL and SHIFT as buttons.

Note that in CSL mode LPRINT and LLIST no longer function. Also the CSL software-UART extensions will not work.
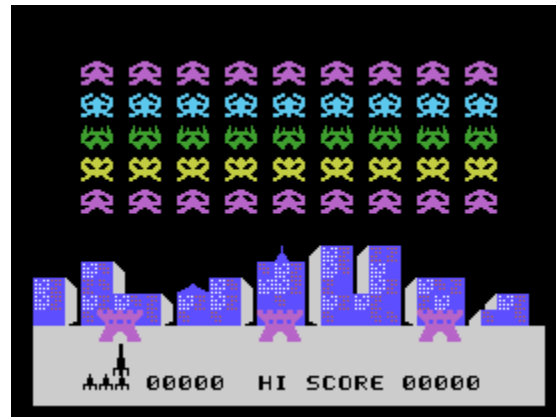
BRUN however, has been fixed.

Playing Sonic Invaders (SONICINV.BIN)

This is a demonstration of how to load and start playing a game
in the emulator.

At the console, type *creatiVision -r SONICINV.BIN*

If you have your BIOS and ROMS in the correct location, you will
be greeted with the Sonic Invaders demo screen.

The intro tune will be playing and a demo of the game will begin.
To start a new game, on a real machine, you would press reset. In
the emulator, this is F3.

You will now have the option, by pressing fire, to select a game
type. For sonic invaders there are,

1 - Single player, single score, visible and normal skill
2 - Two player, two score, visible and normal skill
3 - Two player, single score, visible and normal skill
4 - Four player, two score, visible and normal skill
5 - Single player, single score, invisible and normal skill
6 - Two player, two score, invisible and normal skill
7 - Two player, single score, invisible and normal skill
8 - Four player, two score, invisible and normal skill
9 - Single player, single score, visible and high skill
10- Two player, two score, visible and high skill
11- Two player, single score, visible and high skill
12- Four player, two score, visible and high skill
13- Single player, single score, invisible and high skill
14- Two player, two score, invisible and high skill
15- Two player, single score, invisible and high skill
16- Four player, two score, invisible and high skill

Press LEFT CTRL (joystick one fire) to select.
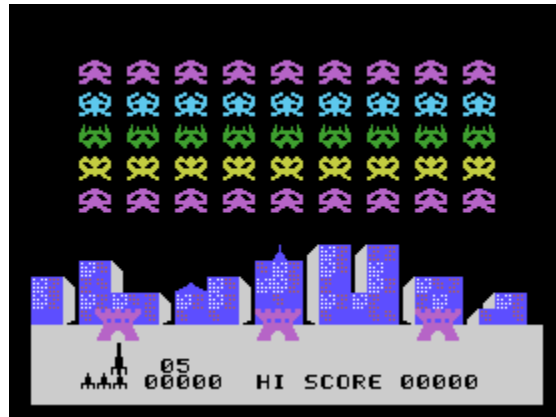
Here, it's game 5. When ready to start, press any key on the lower row (Z - /).

CSL Cartridge Emulation

The CSL is a custom designed upgrade for the creatiVision clones which brings the BASIC and RAM from the Salora Manager / Laser 2001 to the creatiVision.

In the emulator, you select this mode with -2.

To load a program, say andromeda, from a cas file, you would use

creatiVision -2 -c andromeda.cas

The CSL will boot up and show

To continue to load the program, you can use CLOAD, then RUN. Or
you can combine these to the shorter CRUN.

```
BASIC VERSION 2.1
(C) 1983 VTL

CRUN
LOADING PROGRAM
```

Once loaded, remember it's working in real time - you will be
welcomed to the Andromeda screen.

```
A N D R O M E D A
-----------------
toetliche Strahlen greifen an
Spielanileitung ? (J/N)




(c) 1984 by Volker Becker
```

That's it - hope you enjoyed the whirlwind tour of the creatiVision
emulator.

Network Play

As of 15.12.27, there is a network play option.

The protocol is TCP, using port 54321.

To start a game server use *creatiVision –n 1 –r sonicinv.bin*

The emulator will now wait for a connection from a client.

To start a game client use *creatiVision –n 2 –i IP_Address*

Obviously, IP_Address should be the address of the machine which is running the server. For example, if the IP_Address was 192.168.0.7, use *creatiVision –n 2 –i 192.168.0.7*

Once connected the server will send the contents of the virtual RAM to the client – thus ensuring they both have the same ROM and BIOS.

Only player 1 can use RESET (F3) and SELECT (Z).

Both players 1 and 2 use keyboard cursors, LEFT-CTRL and LEFT-SHIFT during gameplay.

Either player can end the game by pressing ESCAPE.

This can also be used to just "mirror" a one player game on a remote PC.

Laser DOS V1.0

Release 16.04.24 now supports floppy disk images in Laser DOS V1.0 format.

To create a new disk, use *creatiVision -3,* to enter Salora Manager mode. You will be given a DISK I/O ERROR. Issue the FORMAT command, and you now have a formatted floppy disk image.

If you do not wish to use the disk functions, just rename bios/disk.rom to anything else.

Utilities

This describes the functions of the various utilities available to support the creatiVision emulator.

txt2cas - A utility to convert correctly formatted BASIC 82/83 source listings to binary CAS for loading in the emulator.

bas2cas - A utility to convert MS-BASIC 1.0 / 2.1 listings to tokenised binary CAS for loading in the emulator.

cvgfx - A simple program to dump a ROM as a text image. This makes it relatively easy to alter a tile graphic and rebuild the ROM.

cas2wav - A utility to convert a creatiVision CAS file to a WAV for loading through a PC or tape deck.

SMBloader - A utility to convert ROM images to WAV for loading on the Salora Manager or Laser 2001.

Building with CMAKE

Either download the source archive or checkout from SourceForge. Within the extracted folder, create a sub-folder of build.

Dependencies required are SDL2, SDL2_Net and libpng.

Windows	cmake –G "MSYS Makefiles" ../ && make
Debian	cmake –G "Unix Makefiles" ../ && make
Raspberry Pi	cmake –G "Unix Makefiles" ../ && make -DRPI

That's all there is to it.

From release 16.04.24 there will only be a Windows 32 bit binary.

Credits

The CSL cartridge is designed and manufactured by Thomas Gutmeier from http://www.8bit-homecomputermuseum.at/

He also makes a 16KB ram upgrade and replacement audio interface for the creatiVision and clones.

The creatiVision Emulator is built with EmuLib from Marat Fayzullin, and is available at http://fms.komkon.org

The SN76489 module is an adapted version of the SonicPlayer PSG module, available from http://www.paulsprojects.net

The community at http://www.madrigaldesign.it/creativemu for testing my theories on *REAL* machines.

SDL libraries can be found at http://www.libSDL.org and also https://www.libsdl.org/projects/SDL_net/

zlib is available from http://www.zlib.net

libPNG is available from http://www.libpng.org