Chip 8 Interpreter

The VIP2K Chip 8 Interpreter is designed by Marcel van Tongeren and was based on the VIP Chip 8 Interpreter.

Any chip 8 software should run on the VIP2K but due to the larger screen resolution and faster CPU some speed differences will be noticeable. There are also some differences in the Chip 8 instruction set but besides missing sound support should not be noticeable. Chip 8X, Chip 10, Chip ETI600, Chip 8 Hires and Chip 8 using 1802 subroutines are not supported.

Before starting Chip 8 with the 'C' command make sure to load Chip 8 SW in Intel hex format with the 'I'' command.

Key Functions

During runtime the following key functions are supported:
Control Q: Quit chip 8
Control 1 to 9: Speed where 1 is slowest, 9 is fastest
Control K: Reset keyboard map to default
Control R: Reset Chip 8 interpreter
Control S: Reset Chip 8 interpreter and start-up in small screen mode, i.e. 2x4 pixel size.
Control L: Reset Chip 8 interpreter and start-up in large screen mode, i.e. 3x5 pixel size

The smaller screen size is recommended for software that uses more and larger graphic or screen updates.

Default Key Mapping

0-9, A-F: Chip 8 keys 0-F
I: Chip 8 key 2
J: Chip 8 key 4
K: Chip 8 key 6
M: Chip 8 key 8
Space: Chip 8 key 5

The definition of I, J, K, M and space allow easier game movement for most games I: up, J: left, K: right, M: down, space: fire.

Dedicated key definition can be included in the Chip 8 hex file by including the complete keyboard mapping table stored in RAM at 0xFF00-0xFFAF.

Location of game keys is at I: 0xFF11, J: 0xFFFA, K: 0xFF12, M:0xFFB, space: 0xFF1B. In the same way default speed value (0xFFA8) and default screen size (0xFFA9) can be included.

Memory Map

8000-81FF: Normally not used but in theory could be used for Chip 8 code
8200-8FFF: Chip user space
E800-EC77: Video RAM

E800-E84D: Top 3 lines, not used by chip 8
E84E-EB8D: Chip 8 video screen for 3x5 pixel format
EB8E-EBF5: Bottom 4 lines normally used by chip 8, some games like Pong use some of these lines
EBF6-EC77: Bottom and top lines should always be 0

E800-E8CF: Top 8 lines, not used by chip 8
E8D0-EC0F: Chip 8 video screen for 2x4 pixel format
EC10-ECF9: Bottom 9 lines normally used by chip 8, some games like Pong use some of these lines
ECFA-ED95: Bottom and top lines should always be 0

FF00-FF9F: Key Mapping table
FFA0-FFA4: CHIP8 identifier text
FFA8: Speed, 0-0x30 in steps of 6
FFA9: Screen resolution, 0: large with 3x5 pixel size, NOT 0: small with 2x4 pixel size
FFB2-FFCF: Jump table for Chip 8 instructions

FFE0-FFEF: Chip 8 V0-VF variables
FFF0-FFF3: Graphic scratch area
FFF9: Keyboard code
FFFA: Chip 8 counter, counting down to 0 from value as set by Chip 8 instruction

Differences in Chip 8 instruction set

	Original Chip 8	VIP 2K Chip 8
User space	0x200 – 0xEFF	0x8000 – 0x8FFF, starting address is at 0x8200
00aa, SYS 0aa		Call 1802 system routine at 70aa
0aaa, SYS aaa	Call 1802 system routine at aaa	Call 1802 system routine at 8aaa (aaa > 0FF)
1aaa, JP aaa	Jump to address aaa	Jump to address 8aaa
2aaa, CALL aaa	Call subroutine at aaa	Call subroutine at 8aaa
Aaaa, LD I, aaa	I = aaa	I = 8aaa
Baaa, JP V0, aaa	Jump to address aaa + V0	Jump to address 8aaa + V0
Fx18, LD ST, Vx	Soundtimer = Vx	NOP