**8008 Machine**

This is my design for a hypothetical but plausible 8008 based computer, with 8k ROM, up to 8k RAM, 1 sound channel, 128 x 64 monochrome graphics, and ASCII keyboard and controller input.

**CPU**

The CPU is an 8008-1 clocked at 800Khz.

**RAM Memory**

RAM memory is from $0000-$1FFF (8k maximum)

Minimum RAM memory supported is 512 bytes.

Memory is not mirrored.

**ROM Memory**

ROM memory is from $2000-$3FFF (8k maximum)

Any unused ROM space is not mirrored. The machine boots to $8000

**Video Display**

Video display is 128 x 64 pixels. The display occupies 1k of RAM which is write-only. This memory is mirror mapped from $2000-$3FFF (e.g. any page). The display provides a 16 x 8 character using 8x8 but can of course use any format you want as it is memory mapped.

Memory is 16 consecutive bytes per line, 1 bit per pixel, Most significant bit = Left most pixel.

**Keyboard**

Input is provided by a positive strobe keyboard without latch connected to Input Port 0 – when a key is pressed bit 7 is logic ‘1’ and bits 0-6 are the ASCII value typed.

**Joystick**

The joystick is a classic one button 4 direction joystick – bit 0 = up, 1 = down, 2 = left, 3 = right, 4,5,6 are zero and 7 is fire. This is read as a current state through Input port 1.

**Booting**

Booting the 8008 is hacked using a Set/Reset Flip Flop, which is set by the Reset button, and cleared by reading the Keyboard port (port 0). This ties A13 to logic ‘1’ causing the 8008 to execute from $8000. The boot ROM should start JMP $8003 ; INP 0. It is a similar design to the COSMAC VIP.

**Sound**

Single channel sound is provided. This is provided by an 8 bit latch, connected to an R/2R D/A ladder which provides a voltage from 0-5V ; this corresponds to a frequency of (5-v)\*200 Hz, or in latch terms 1000\*((255-n)/256) Hz

When v is 5 the frequency is below the human range, though this might not actually work and it might need to be disabled.

The latch is connected to output port 8.

**Backing Storage**

tbc