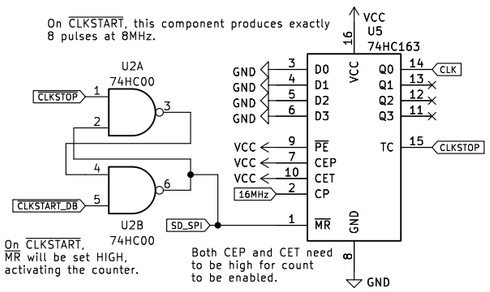
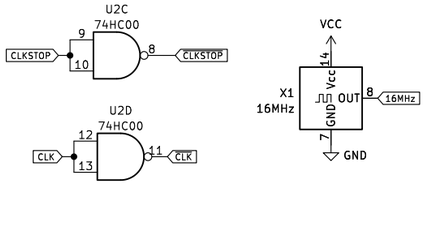
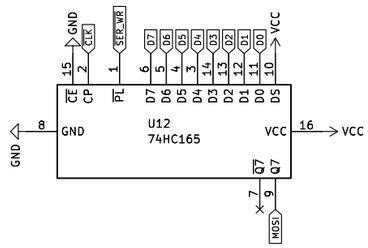
CLOCK COMPONENT

On $\overline{\text{CLKSTART}}$, this component produces exactly 8 pulses at 8MHz.

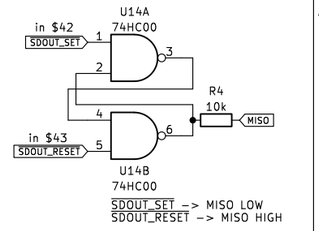


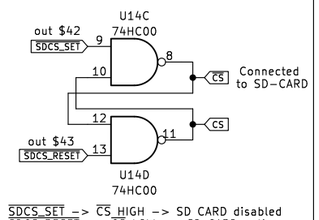


SHIFT REGISTER Z80 -> SD OUT REGISTER



SD CARD S/R LATCHES

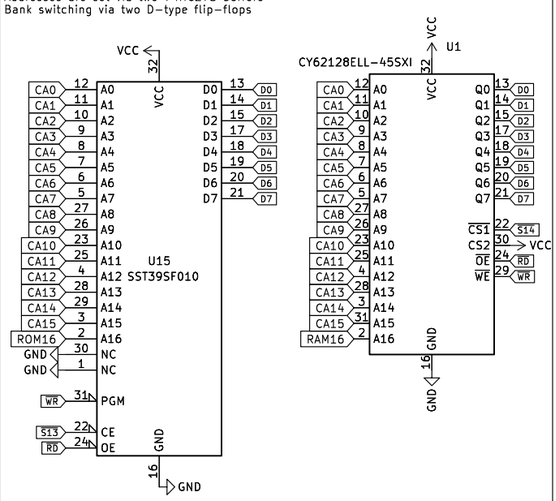




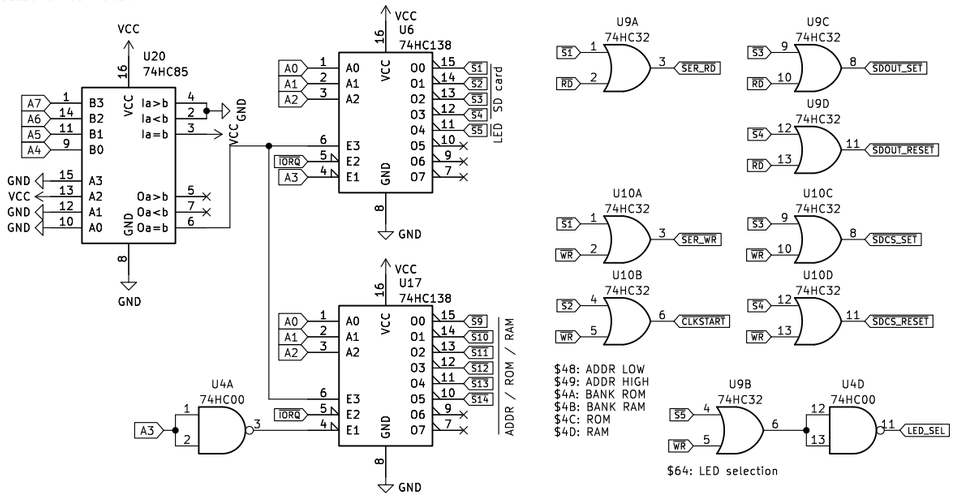
ROM and RAM chips

Expose 2x64kb of memory via bank switching

Addresses are set via two 74HC273 buffers
Bank switching via two D-type flip-flops



SELECTION COMPONENT

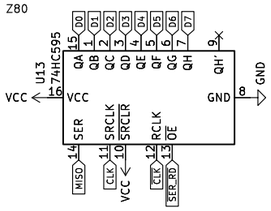


out $40: $\overline{\text{SER\_WR}}$ is pulled low, loading the values on the data bus into the out register.
out $41: $\overline{\text{CLKSTART}}$ is pulled low, starting the counter circuit and pushing a byte into the SD card while simultaneously reading a byte.
out $42: $\overline{\text{SDCS\_SET}}$ is pulled low, pulling $\overline{\text{CS}}$ high, deactivating the SD card.
out $43: $\overline{\text{SDCS\_RESET}}$ is pulled low, pulling $\overline{\text{CS}}$ low, activating the SD card.

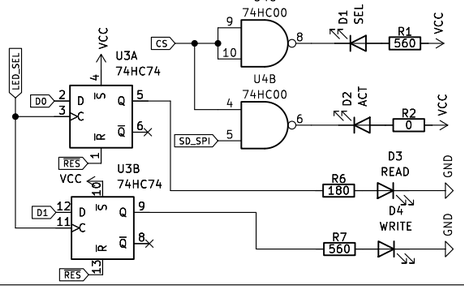
in $40: $\overline{\text{SER\_RD}}$ is pulled low, reading from the in register.
in $41: Does nothing
in $42: $\overline{\text{SDOUT\_SET}}$ is pulled low, pulling MISO low via a 10k resistor.
in $43: $\overline{\text{SDOUT\_RESET}}$ is pulled low, pulling MISO high via a 10k resistor.

When no card is present, the output of the SD card will follow the output of the SET/RESET latch, however if a card is present, though unresponsive, it will not follow and the same (high) output will be received.

SHIFT REGISTER SD -> Z80 IN REGISTER



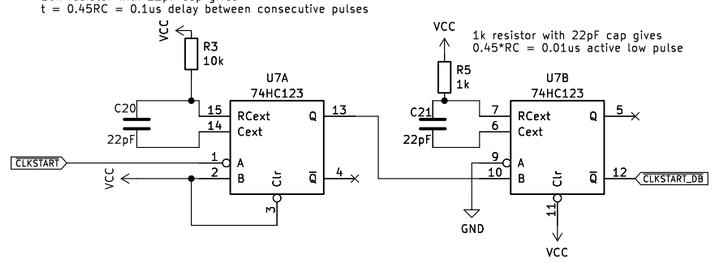
Two LEDS show whether the SD card is selected via the CS line and whether signals are sent to the SD card. Another two leds show I/O on the RAM and ROM chips.



MULTIVIBRATOR DELAY COMPONENT

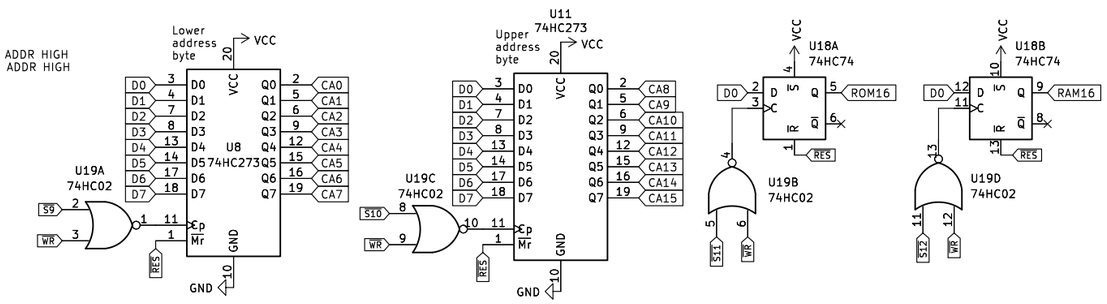
10k resistor with 22pF cap gives
t = 0.45RC = 0.1us delay between consecutive pulses

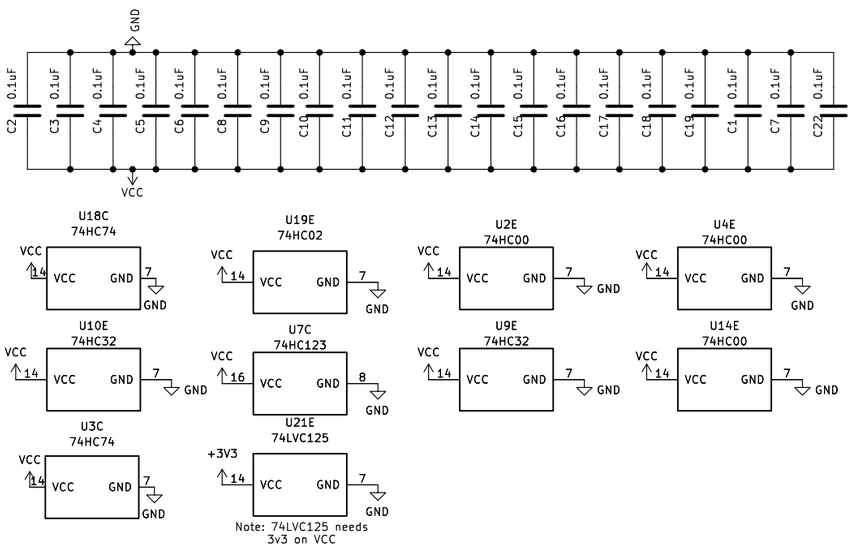
1k resistor with 22pF cap gives
0.45*RC = 0.01us active low pulse

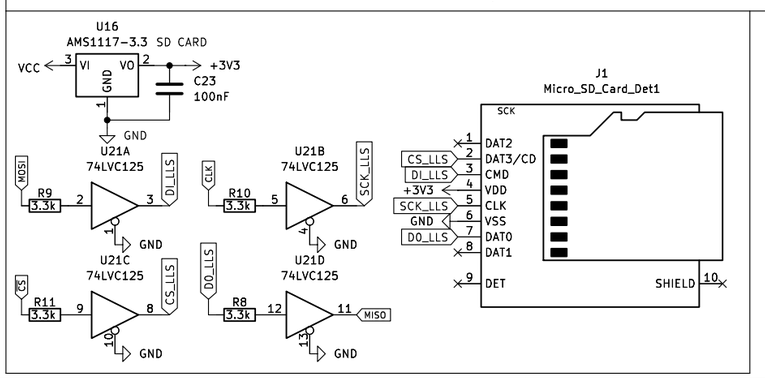


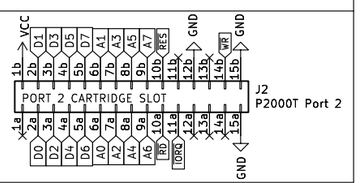
Set 16 bit address for the ROM and RAM chips. The logic circuitry for the $\overline{\text{CP}}$ signal uses the remaining gates on the 74HC04, 74HC00 and 74HC21 chips.

* $\overline{\text{S5}}$ and $\overline{\text{WR}}$ both LOW, CP for lower byte ADDR HIGH
* $\overline{\text{S6}}$ and $\overline{\text{WR}}$ both LOW, CP for upper byte ADDR HIGH









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File: port2-sdcard-interface.kicad_sch

Title: Philips P2000T SD-CARD SLOT2 cartridge

Size: A3	Date: 2024-05-26	**Rev: rev6**
KiCad E.D.A. 8.0.2		Id: 1/1