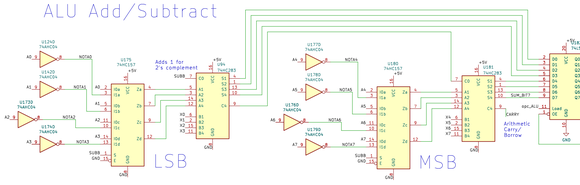
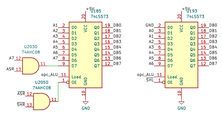
Myth Microcontroller Reference Schematic

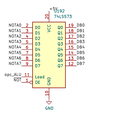
ALU Add/Subtract



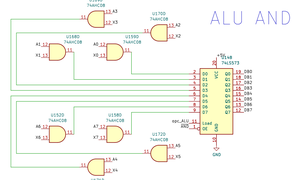
ALU SHIFT



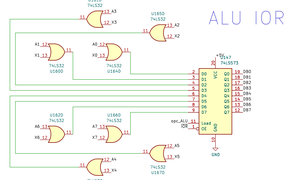
NOT



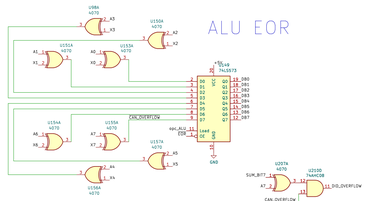
ALU AND



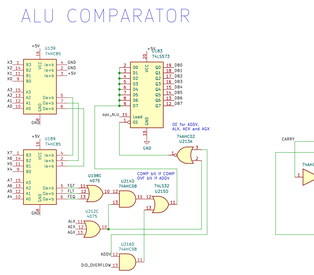
ALU IOR



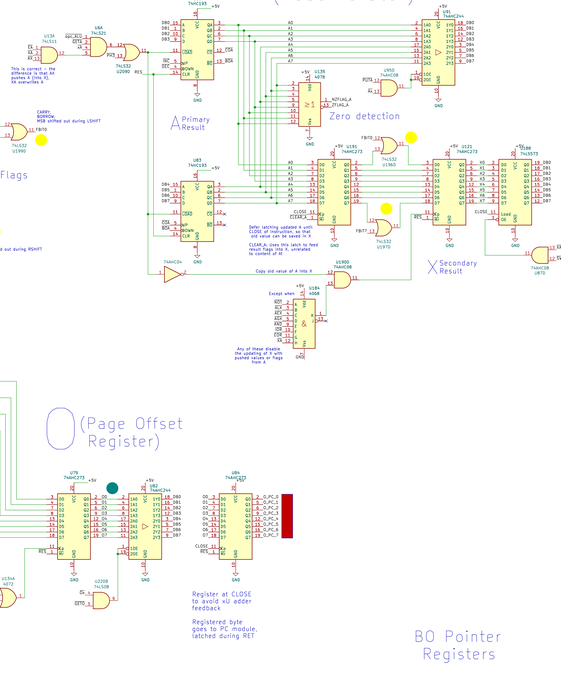
ALU EOR



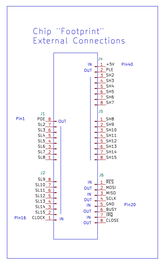
ALU COMPARATOR



AX (Accumulator)

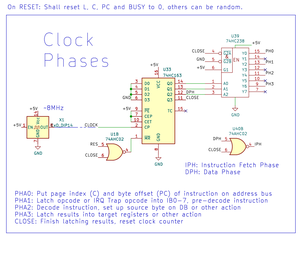


Chip "Footprint" External Connections

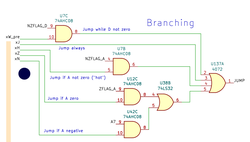


On RESET: Shall reset L, C, PC and BUSY to 0, others can be random.

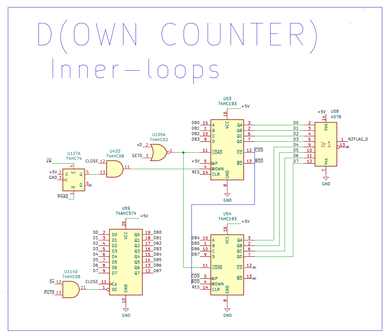
Clock Phases



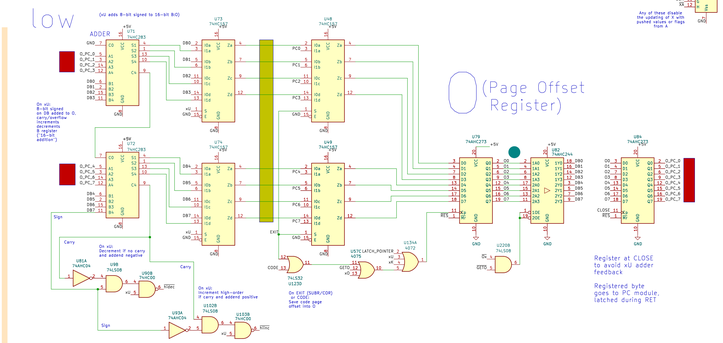
Branching



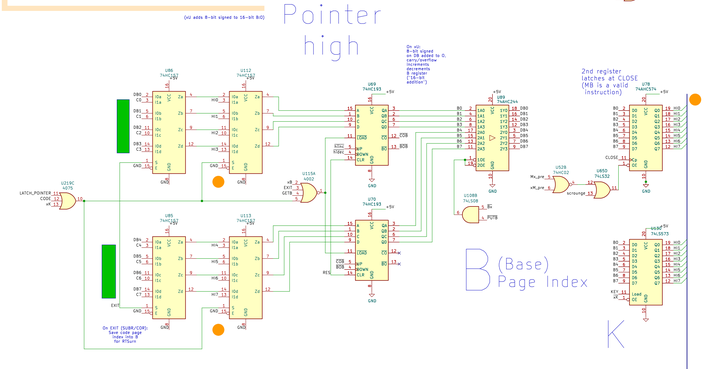
D(OWN COUNTER) Inner-loops



Pointer low

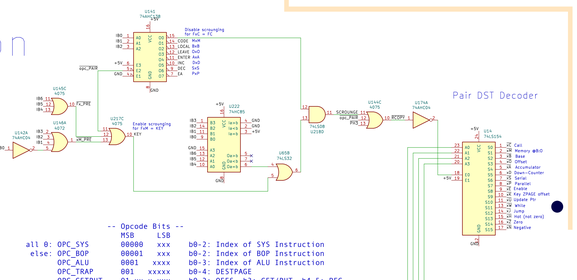


Pointer high



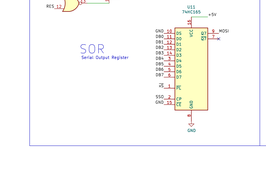
Scrounger

Remap ("scrounge") inherent NOPs such as AA, DD etc. and impracticable opcodes such as FM to other instructions

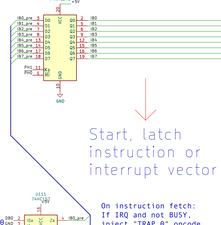


Instruction Decoder

GETPUT Decoder

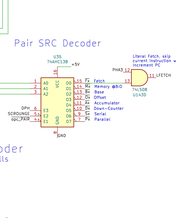


Instruction-Word Latch

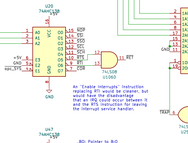


Pair DST Decoder

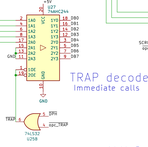
Pair SRC Decoder



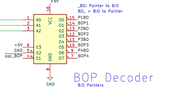
SYS Decoder



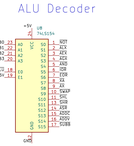
TRAP decoder Immediate calls



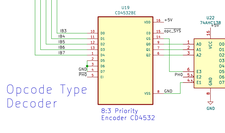
BOP Decoder BO Pointers



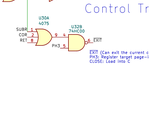
ALU Decoder



Opcode Type Decoder

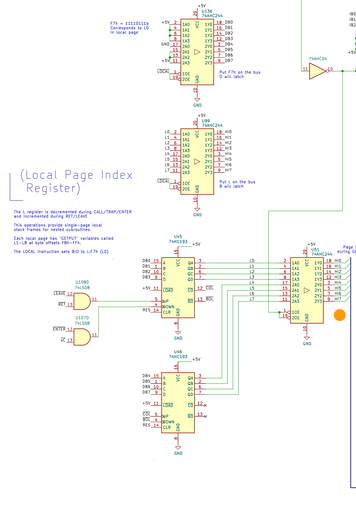


Control Tree

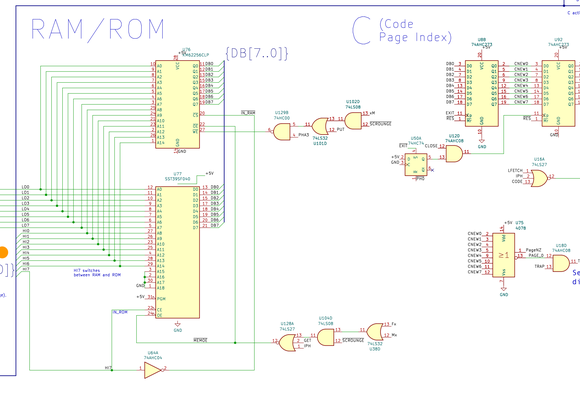


(PC Program Counter)

(Local Page Index Register)

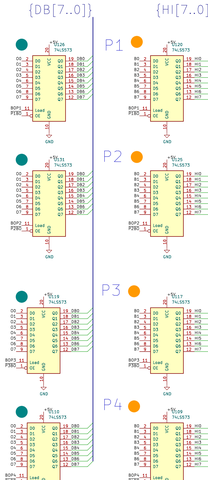


RAM/ROM



(Code Page Index)

BO Pointer Registers



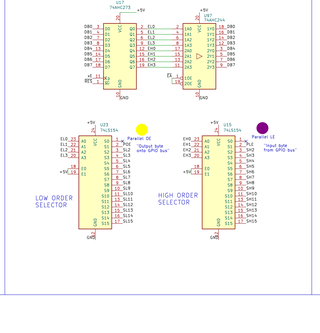
Input/Output

S Serial IO

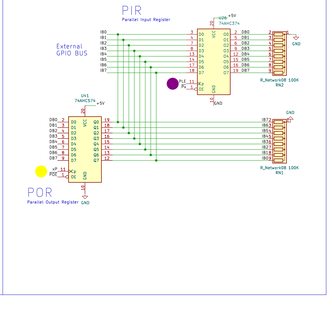
Implements SPI functionality with dedicated SER/DES registers

E Device Enable Register

Two independent 4-bit groups (High/low) feed into 4:16 decoders for device selection



P Parallel IO




```
-- Opcode Bits --
        MSB    LSB
all 0: OPC_SYS      00000   xxx     b0-2: Index of SYS Instruction
 else: OPC_BOP      00001   xxx     b0-2: Index of BOP Instruction
       OPC_ALU      0001    xxxx    b0-3: Index of ALU Instruction
       OPC_TRAP     001     xxxxx   b0-4: DESTPAGE
       OPC_GETPUT   01 xx x xxx     b0-2: OFFS, b3: GET/PUT, b4-5: REG
       OPC_PAIR     1  xxx xxxx     b0-3: DST, b4-6: SRC
```

ALU Instructions

```
 0 NOT   Set A to one's complement of A, X unchanged
 1 ALX   Flag (A<X) in A (255 if true, 0 if false), X unchanged
 2 AEX   Flag (A<=X) in A (255 if true, 0 if false), X unchanged
 3 AGX   Flag (A>X) in A (255 if true, 0 if false), X unchanged
 4 ADD   Set A to (A ADD X), X unchanged
 5 IOR   Set A to (A OR X), X unchanged
 6 EOR   Set A to (A XOR X), X unchanged
 7 XA    Set A equal to X, X unchanged
 8 XAX   Set X equal to A
 9 SWAP  Swap A and X
10 SHL   Shift A left, result in A, set X to previous MSB of A as LSB (0 or 1)
11 SHR   Shift A right logically, result in A, set X to previous LSB of A as MSB (0 or 80h)
12 ASR   Shift A right arithmetically, set X to previous LSB of A as MSB (0 or 80h)
13 ADOC  Add A to X, result in A, CARRY bit in X (0 or 1)
14 AOVF  Add A to X, result in A, OVERFLOW flag in X (255 if OVF, else 0)
15 SUBB  Subtract A from X, result in A, BORROW bit in X (0 or 1)
```


Based on working prototype PCB: https://github.com/michaelmangelsdorf/sanne8
Rev. Sep 08 Feathsh
Project homepage: https://github.com/michaelmangelsdorf/myth
Author: Michael Mangelsdorf
Contact: mim@ok-schalter.de

Sheet: /
File: myth.kicad_sch

Title: Sanne-8 Micro-Controller

Size: User	Date: 2025-08-17	Rev: Myth
KiCad E.D.A. 9.0.1		Id: 1/1