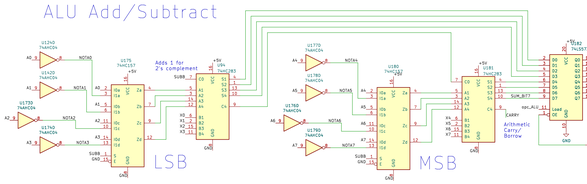
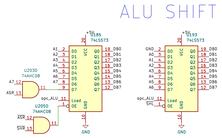
Sonne-8 Microcontroller Reference Schematics Rev. Myth

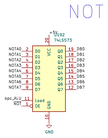
ALU Add/Subtract



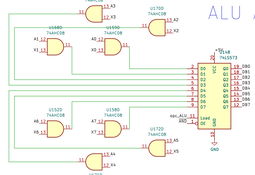
ALU SHIFT



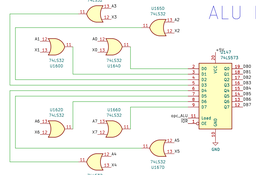
NOT



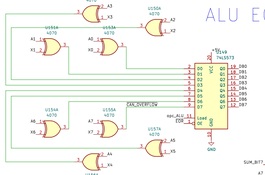
ALU AND



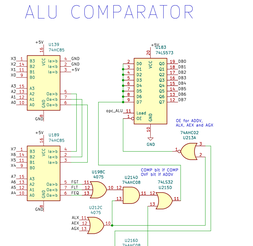
ALU IOR



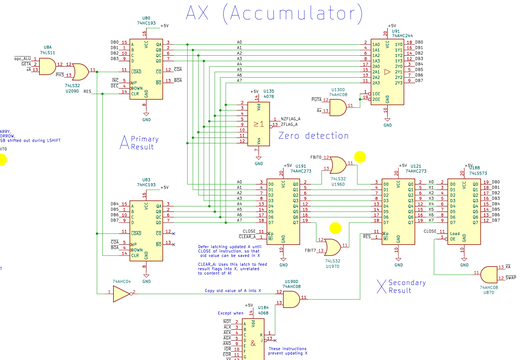
ALU EOR



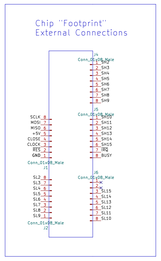
ALU COMPARATOR



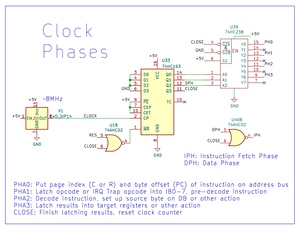
AX (Accumulator)



Chip "Footprint" External Connections



Clock Phases



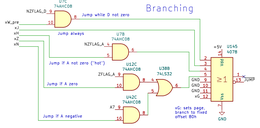
PHA0: Put page index (C or R) and byte offset (PC) of instruction on address bus
PHA1: Latch opcode or IRQ Trap opcode into IR0-7, pre-decode instruction
PHA2: Decode instruction, set up source byte on DB or other action
PHA3: Latch results into target registers or other action
CLOSE: Finish latching results, reset clock counter

IPH: Instruction Fetch Phase
DPH: Data Phase

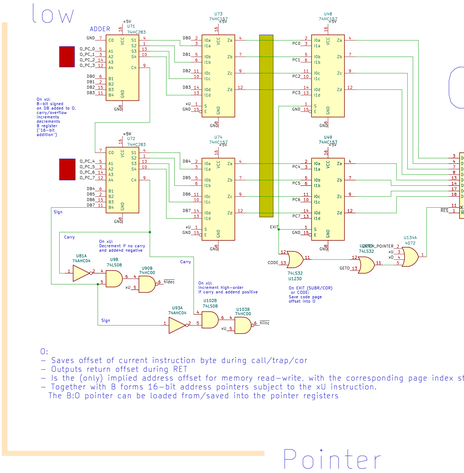
ALU Instructions

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 ANC	Set A to (A AND 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 AX	Set X equal to A
9 SHL	Shift A left, result in A, set X to previous MSB of A as LSB (0 or 1)
10 SHR	Shift A right logically, result in A, set X to previous LSB of A as MSB (0 or 80h)
11 SHA	Shift A right arithmetically, set X to previous LSB of A as MSB (0 or 80h)
12 ADR	Add A to X, result in A, CARRY bit in X (0 or 1)
13 ADC	Add A to X, result in A, CARRY bit in X (255 if CARRY, else 0)
14 ADV	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)

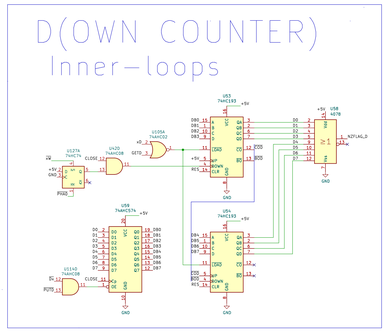
Branching



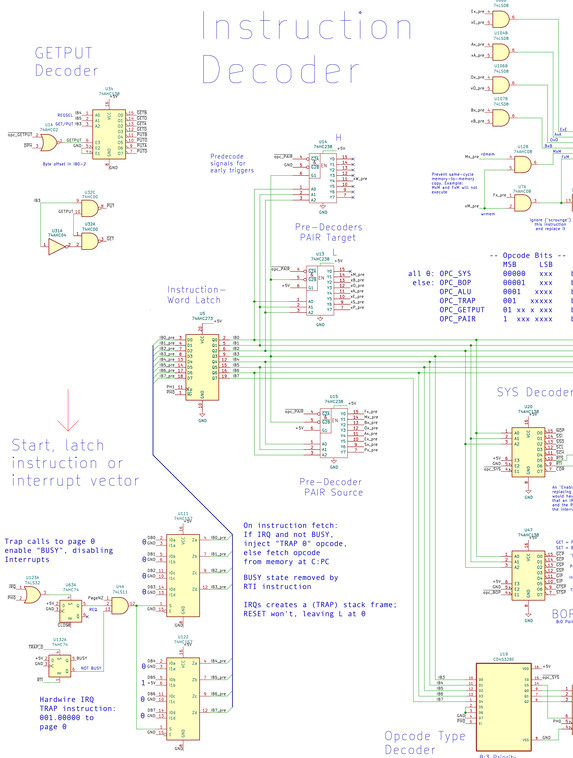
Pointer low



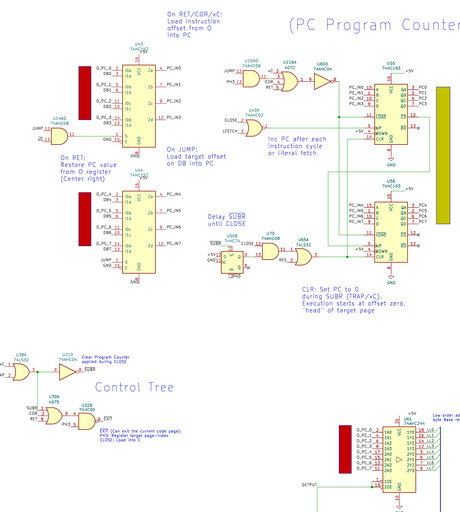
D(OWN COUNTER) Inner-loops



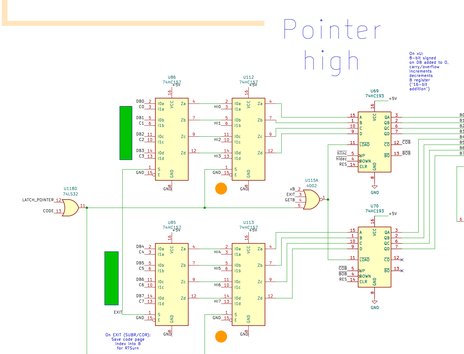
Instruction Decoder



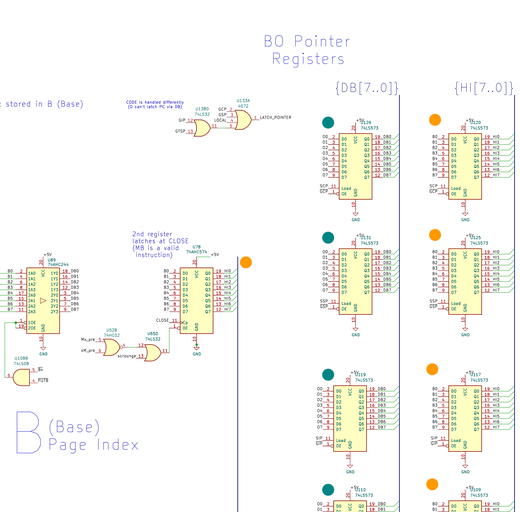
(PC Program Counter)



Pointer high

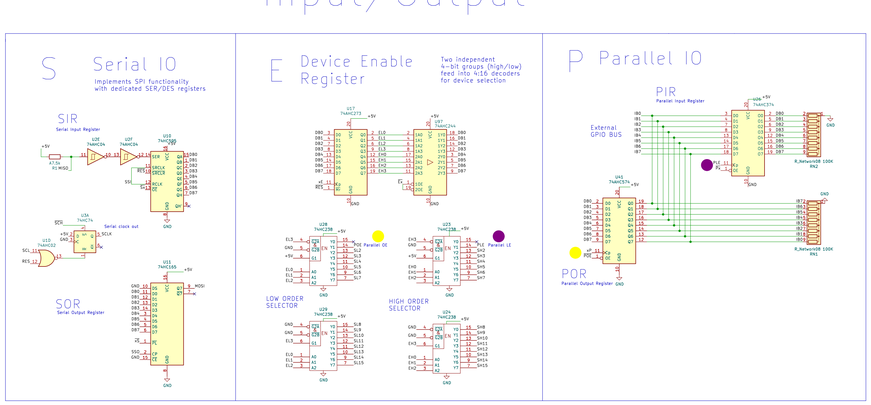


BO Pointer Registers

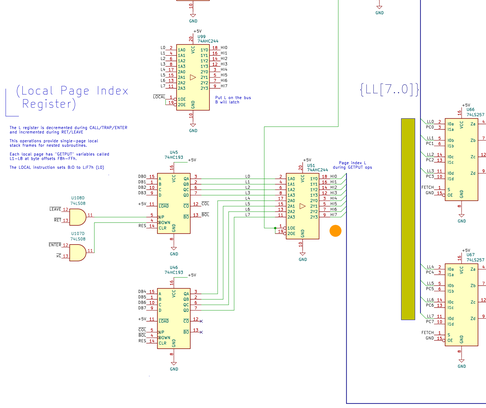


Control Tree

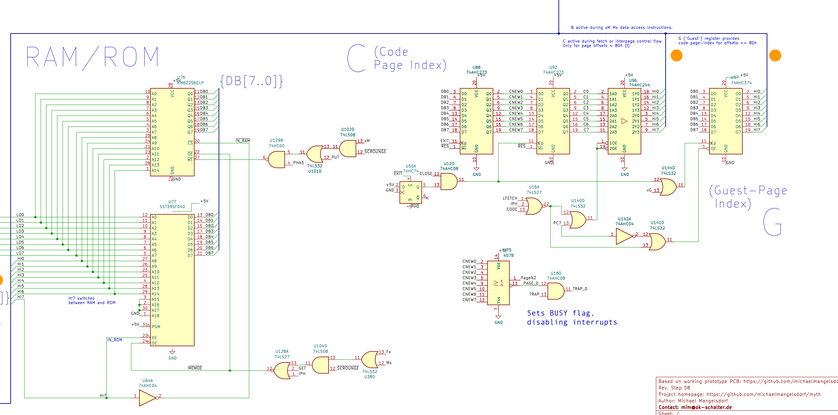
Input/Output



(Local Page Index Register)



RAM/ROM



Based on working prototype PCB: https://github.com/michaelmangelsdorf/sonne8
Rev. Shiy 58
Project homepage: https://github.com/michaelmangelsdorf/myth
Author: Michael Mangelsdorf
Contact: mike@st-schaller.de

Sheet: /
File: myth.kicad_sch

Title: Sonne-8 Micro-Controller

Size: User	Date: 2025-06-14	**Rev: Myth**
KiCad E.D.A. 9.0.1		ID: 1/1