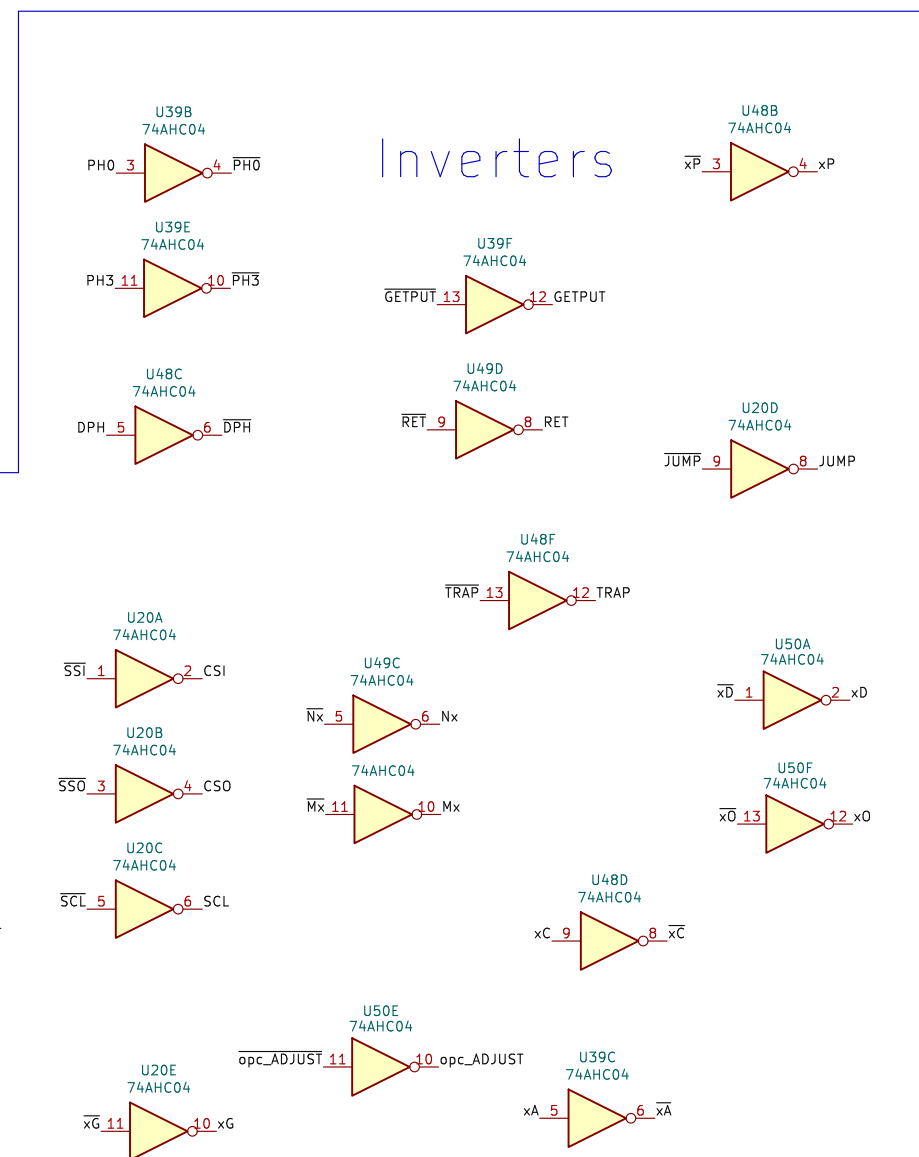
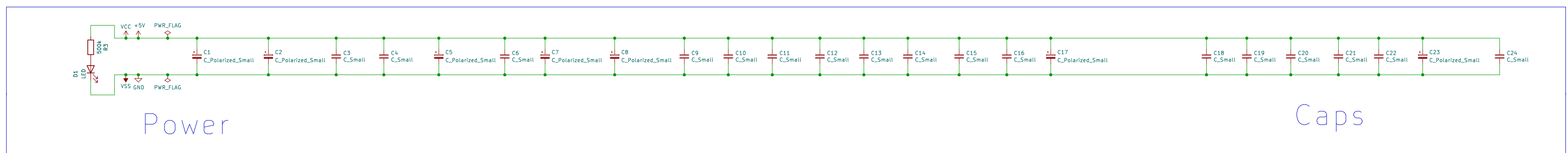
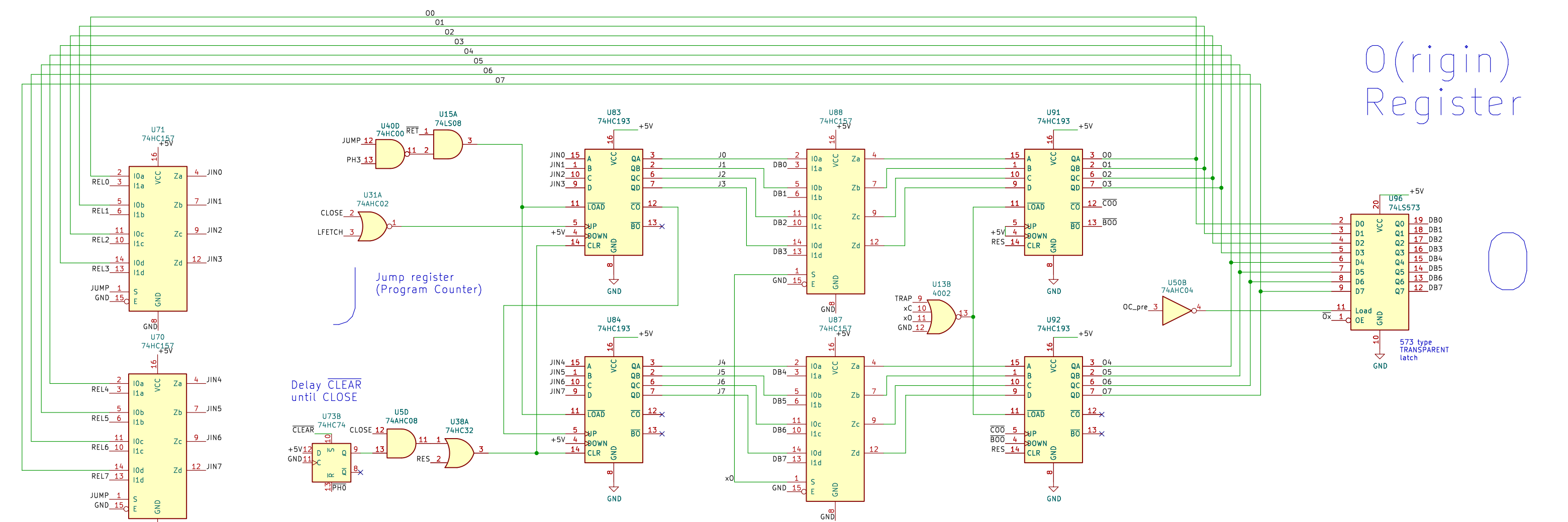


# Sonne Microcontroller Reference Schematics rev. Myth



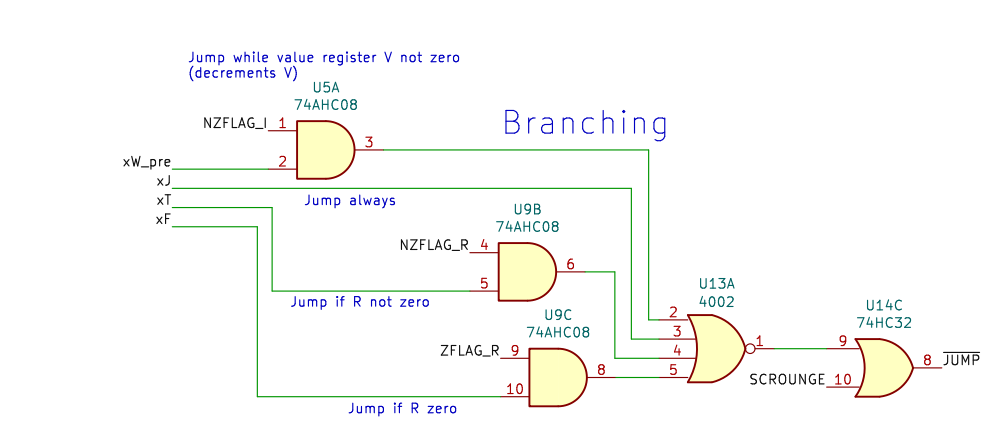
(Relative jumps)



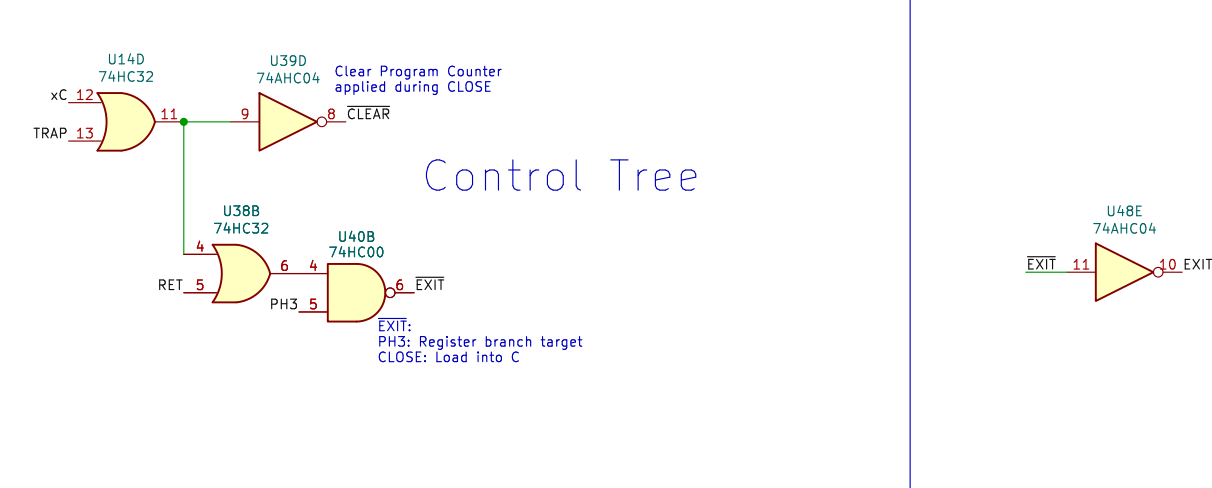
## Instruction Decoder

Scrounger

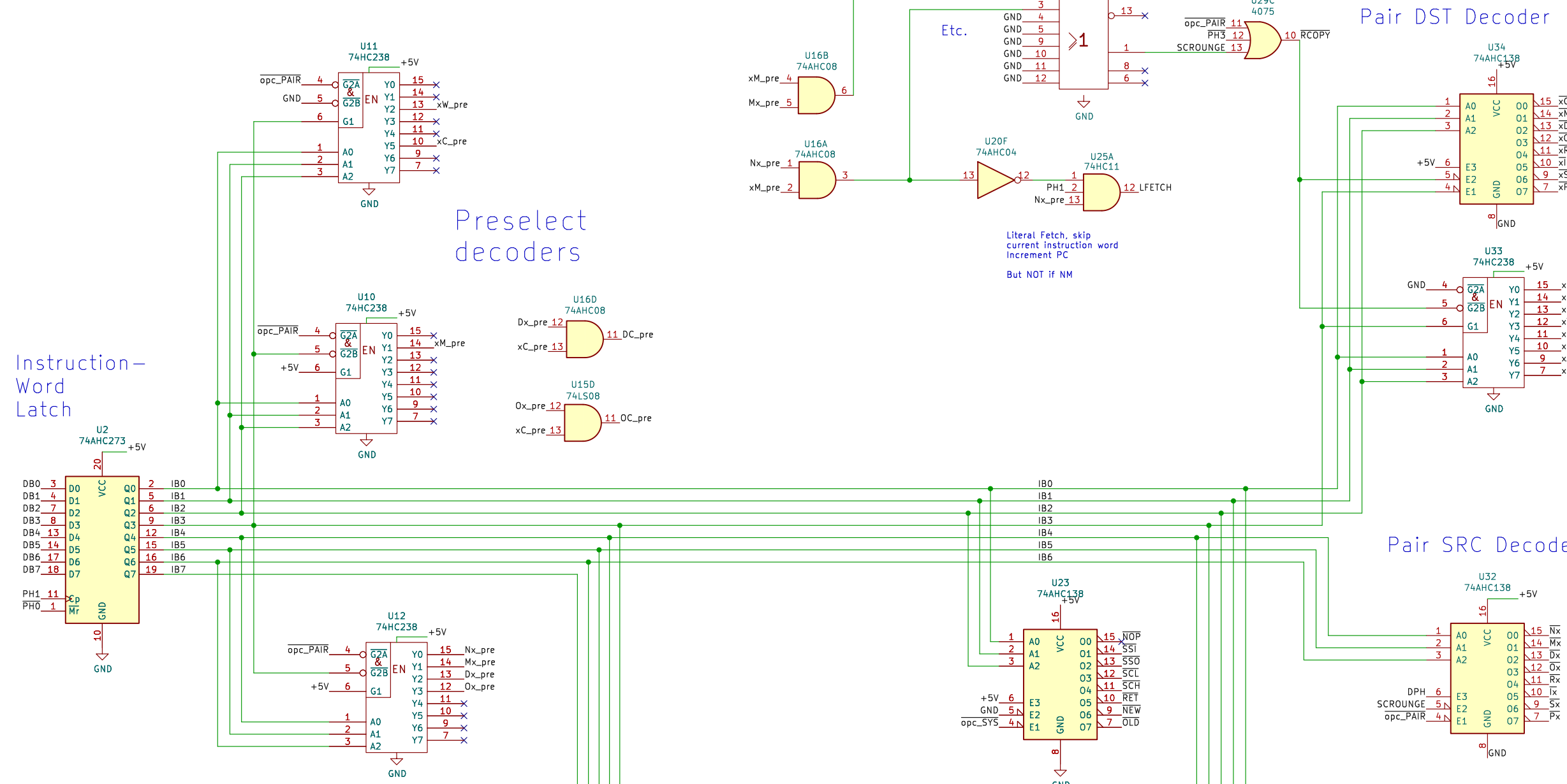
Currently NOP, reserved for instruction set extension



Control Tree



Preselect decoders



Instruction-Word Latch  
PH0: Setup PC on address bus  
PH1: Latch opcode into IB0-7, predecoded  
PH2: Decode setup source file on IB or other action  
PH3: Latch source into target or other action  
CLOSE: Cleanup

Pair DST Decoder

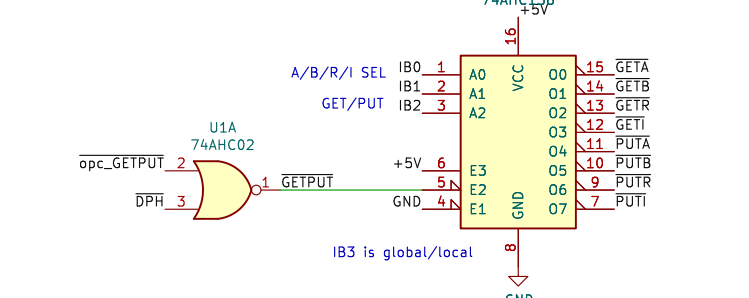
Pair SRC Decoder

Opcode Type Decoder

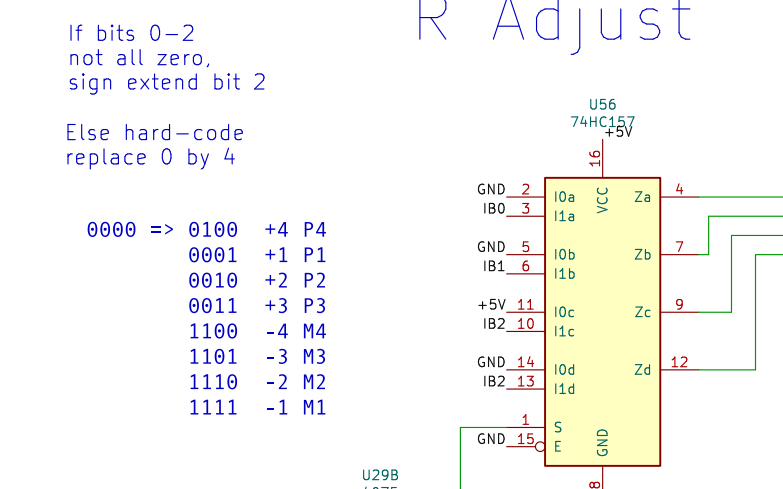
Instruction byte:  
00000 xxx  
00001 xxx  
0001x xxx  
001xx xxx  
01xxx xxx  
1xxxx xxx

See table @ SYS decoder  
b2: extended sign bit b1-0 LSB  
See table @ ALU  
b4: MSB b3-0: LSB (remaining bits set 1)  
b5-4: OFFS b3: GL b2: GP b1-0: ABRV  
DEST SRC

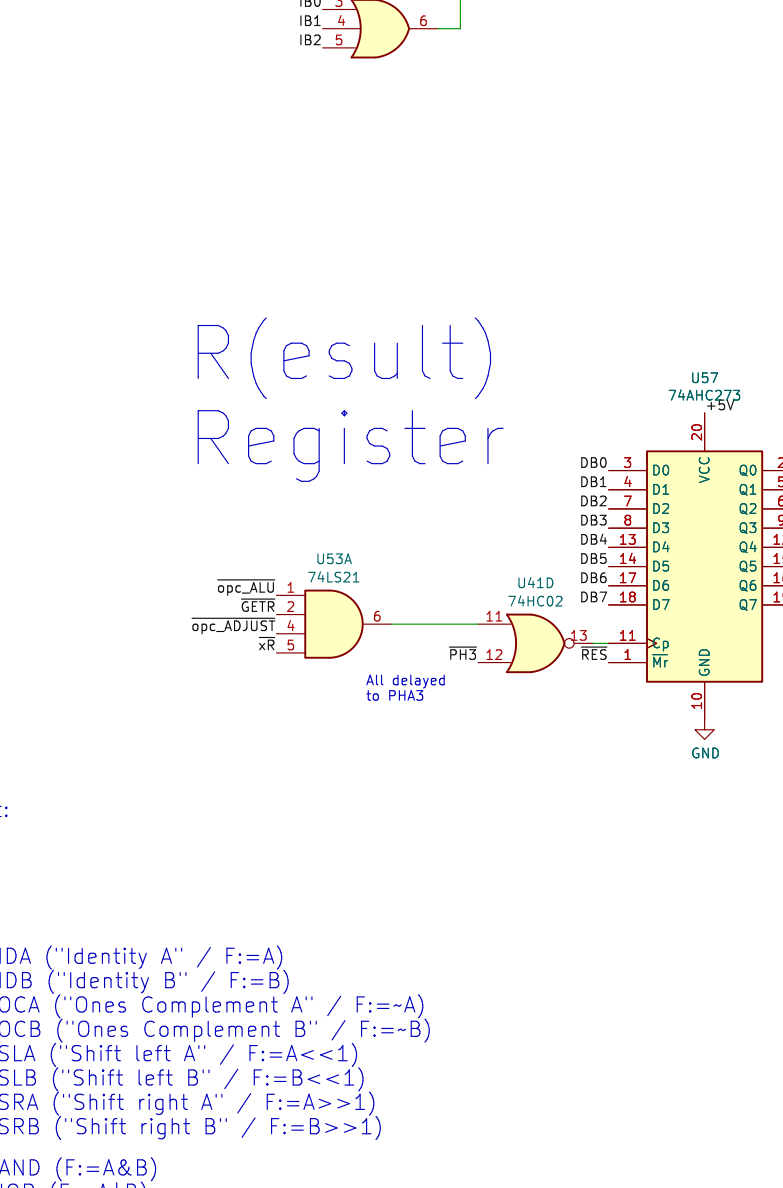
GETPUT Decoder



R Adjust



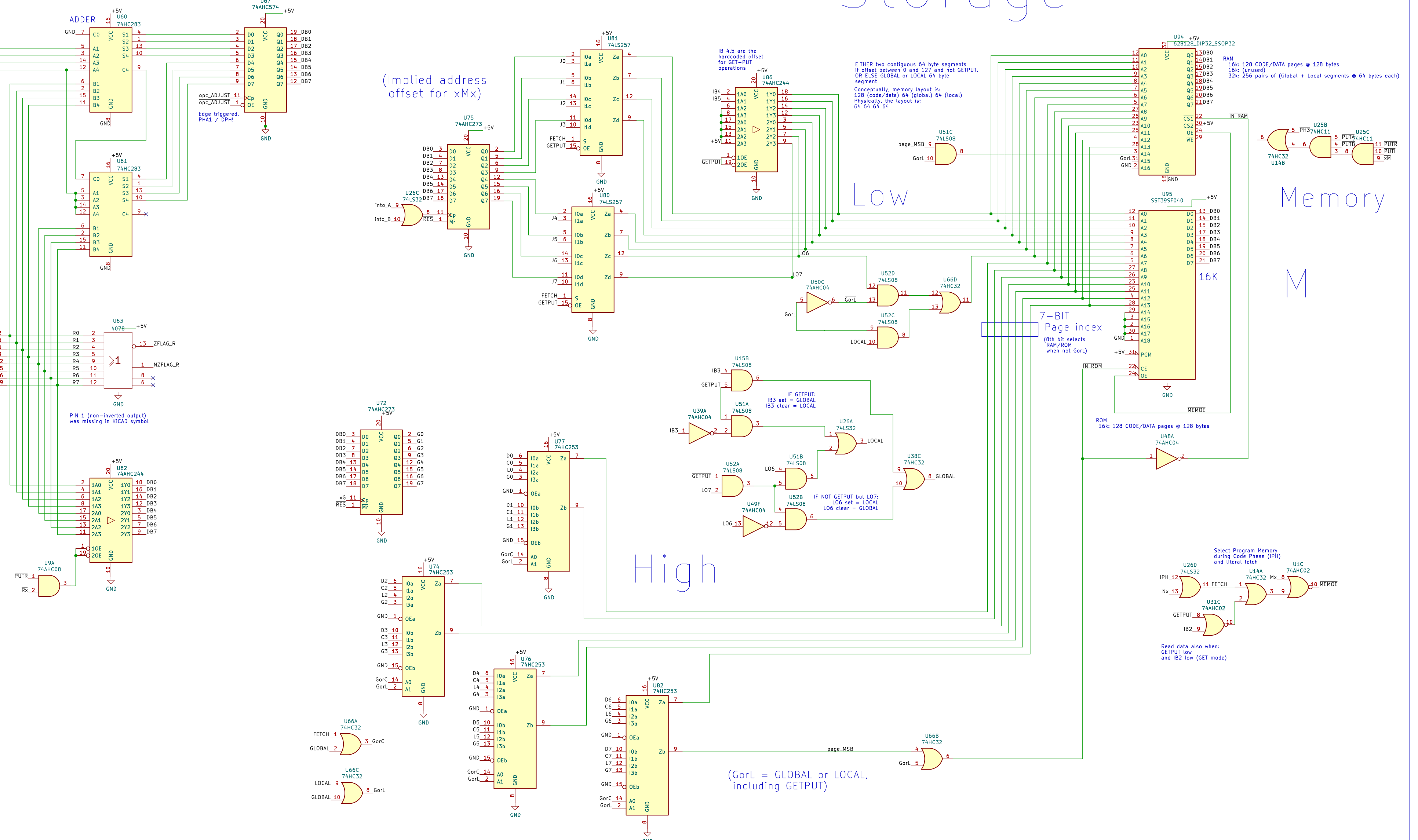
R(esult) Register



BLUR3 LUT ROM layout:  
16 maps @ 256x256

0 IDA (Identity A' / F=A)  
1 IDB (Identity B' / F=B)  
2 OCA (Ones Complement A' / F=A)  
3 OCB (Ones Complement B' / F=B)  
4 SLA (Shift left A' / F=A<<1)  
5 SRA (Shift right A' / F=A>>1)  
6 SRA (Shift right B' / F=B>>1)  
7 SRA (Shift right B' / F=B>>1)  
8 AND (F=A&B)  
9 OR (F=A|B)  
10 XOR (F=A^B)  
11 ADD (Add' / F=A+B, bits 0-7)  
12 CDB (Carry Bit' / F=Carry, 0th bit of A+B) 0th or 01h  
13 ALB (Flag: A less than B' / F=(A<B)? 0xF0  
14 AEB (Flag: A equals B' / F=(A==B)? 0xF0  
15 AGB (Flag: A greater than B' / F=(A>B)? 0xF0

## Storage



Memory

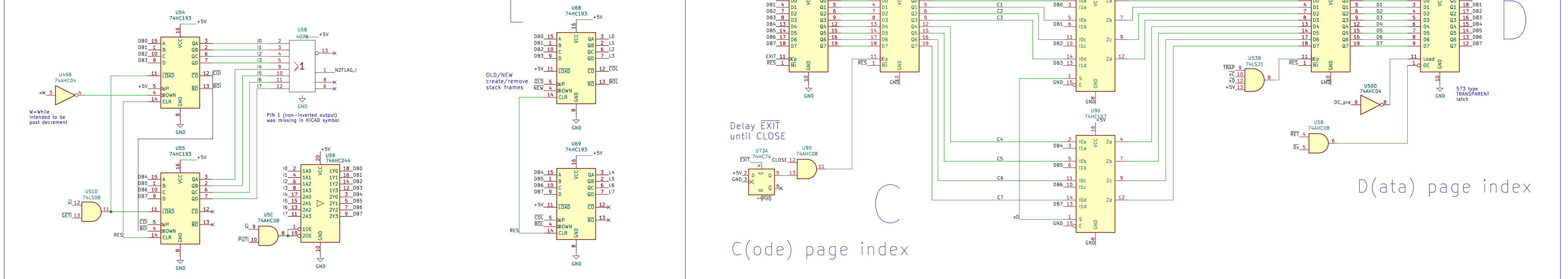
M

High

(Gort = GLOBAL or LOCAL, including GETPUT)

I (INNER) Loop Register

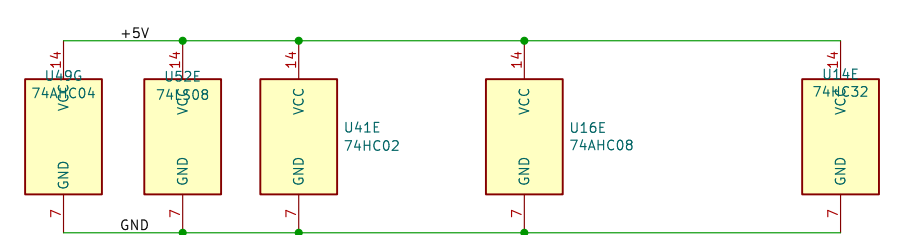
L(ocal) page index Stack Pointer



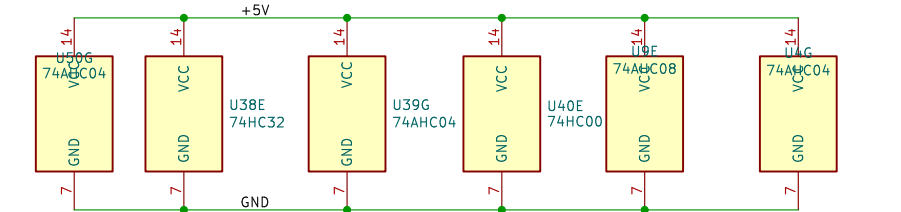
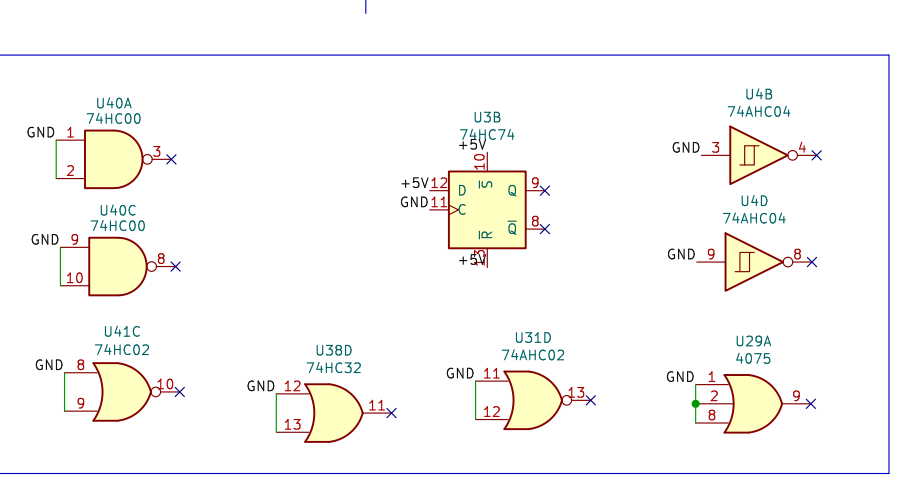
D(ata) page index

C(ode) page index

Glue Logic



Spare Units



Serial IO

Implements SPI functionality with dedicated SER/DES registers

Device Enable

Original 0 selects a NULL DEVICE

Ref. Implementation connects two independent 4-bit groups (high/low) to 4-bit encoders (for simultaneous latch enable / output enable of two separate devices)

