Power Supply and Reset

File: power_supply_and_clock.kicad_sch

Instruction Register and Decoder

File: instruction_register.kicad_sch

Registers

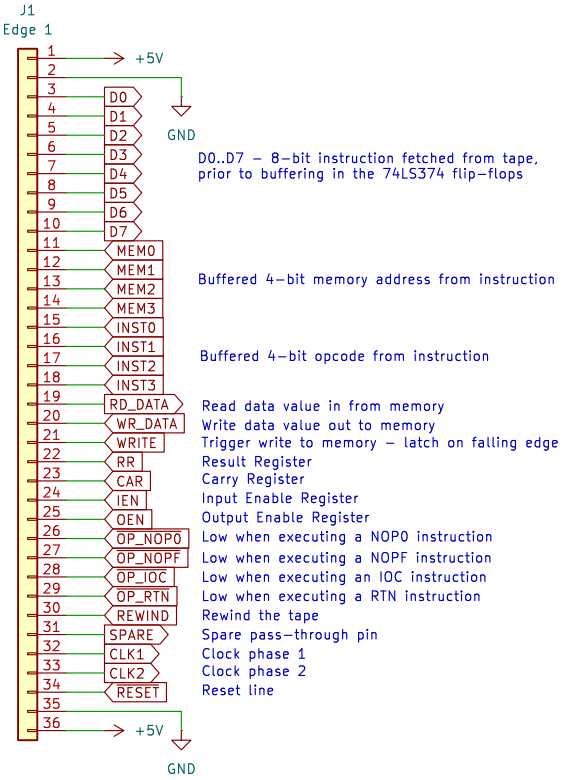
File: registers.kicad_sch

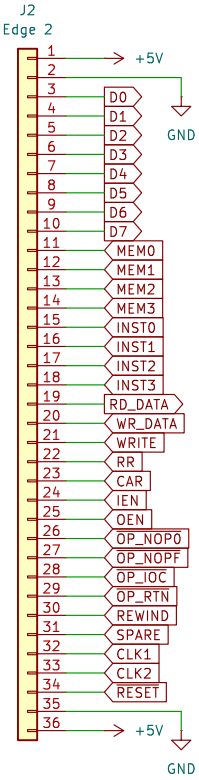
ALU

File: ALU.kicad_sch

Skip Register

File: skip_register.kicad_sch





H1 3mm

H2 3mm

H3 3mm

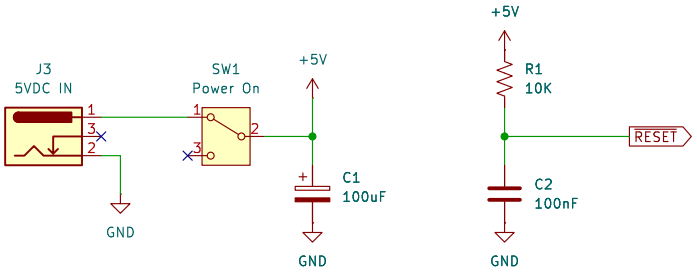
H4 3mm

Edge Connectors

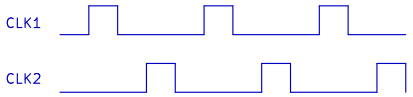
Sheet: /
File: UE14500–TTL.kicad_sch

Title: UE14500 TTL 1–bit Microprocessor

Size: A4	Date: 2025	**Rev: 1**
KiCad E.D.A. 8.0.9		Id: 1/6



Required Clock Signals



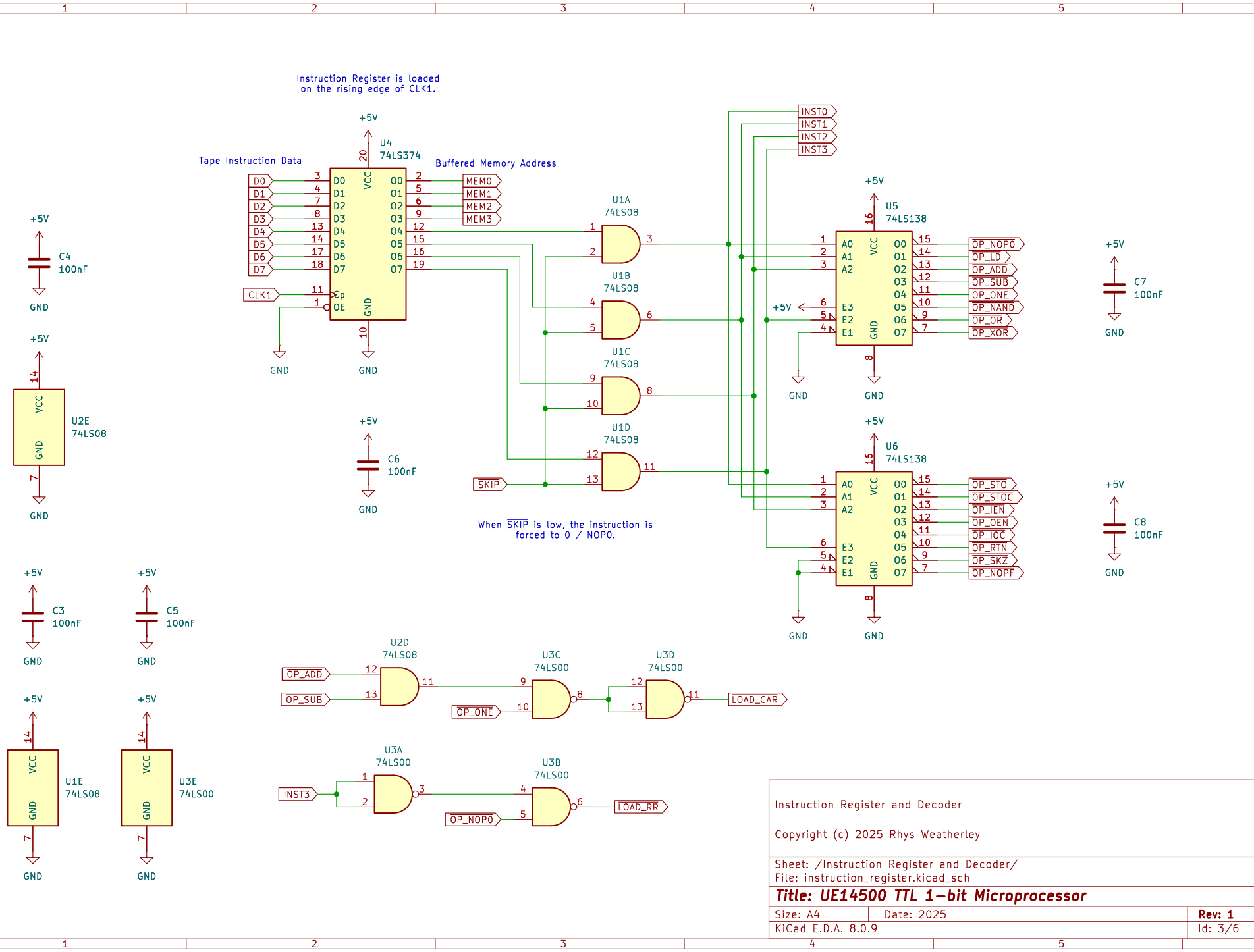
CLK1 rising edge – Load instruction into instruction register
CLK1 falling edge – Update registers and memory
CLK2 rising edge – Update skip register
CLK2 falling edge – Increment program counter / advance tape position

Power Supply and Reset

Sheet: /Power Supply and Reset/
File: power_supply_and_clock.kicad_sch

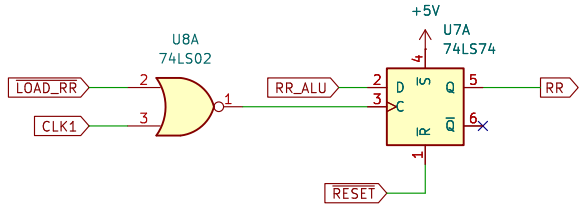
Title: UE14500 TTL 1-bit Microprocessor

Size: A4	Date: 2025	**Rev: 1**
KiCad E.D.A. 8.0.9		Id: 2/6

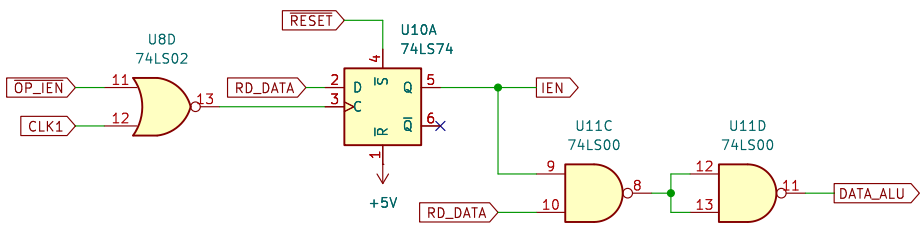

Instruction Register is loaded
on the rising edge of CLK1.
Tape Instruction Data
Buffered Memory Address
U4
74LS374
D0
D1
D2
D3
D4
D5
D6
D7
CLK1
MEM0
MEM1
MEM2
MEM3
INST0
INST1
INST2
INST3
U1A
U1B
U1C
U1D
74LS08
SKIP
When SKIP is low, the instruction is
forced to 0 / NOP0.
U5
U6
74LS138
OP_NOP0
OP_LD
OP_ADD
OP_SUB
OP_ONE
OP_NAND
OP_OR
OP_XOR
OP_STO
OP_STOC
OP_IEN
OP_OEN
OP_IOC
OP_RTN
OP_SKZ
OP_NOPF
C3
C4
C5
C6
C7
C8
100nF
U2E
U1E
U3E
U2D
U3C
U3D
U3A
U3B
74LS00
OP_ADD
OP_SUB
OP_ONE
OP_NOP0
LOAD_CAR
LOAD_RR
+5V
GND
Instruction Register and Decoder
Copyright (c) 2025 Rhys Weatherley
Sheet: /Instruction Register and Decoder/
File: instruction_register.kicad_sch
Title: UE14500 TTL 1-bit Microprocessor
Size: A4
Date: 2025
Rev: 1
KiCad E.D.A. 8.0.9
Id: 3/6

Registers are loaded on the falling edge of CLK1.

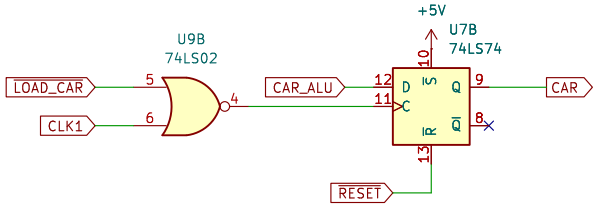
RR – Result Register



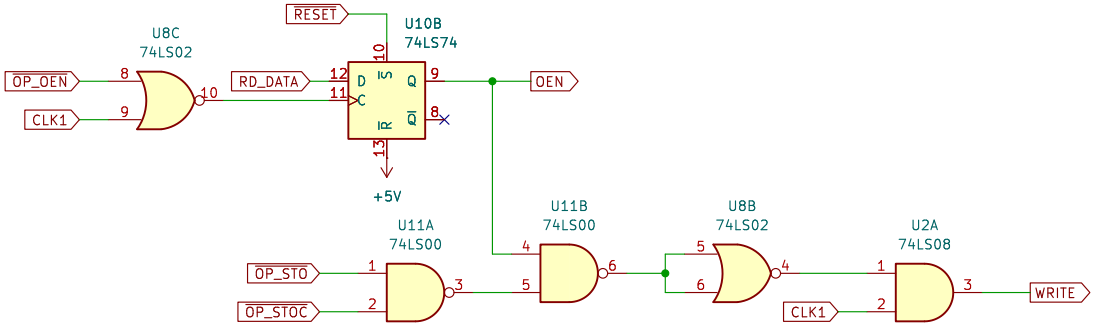
IEN – Input Enable Register



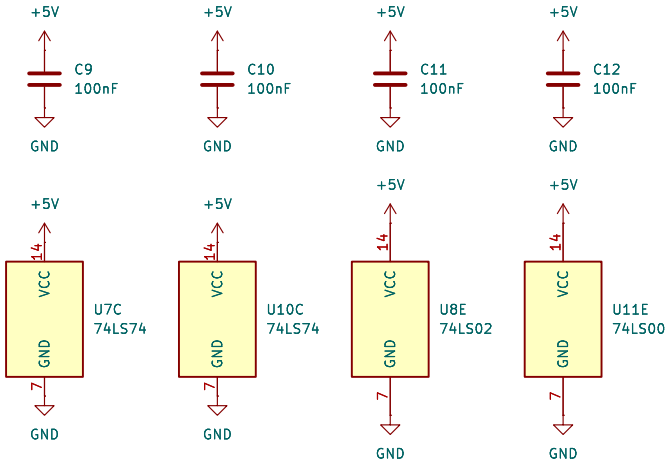
CAR – Carry Register



OEN – Output Enable Register



Latch downstream regisers and memory on the falling edge of WRITE.

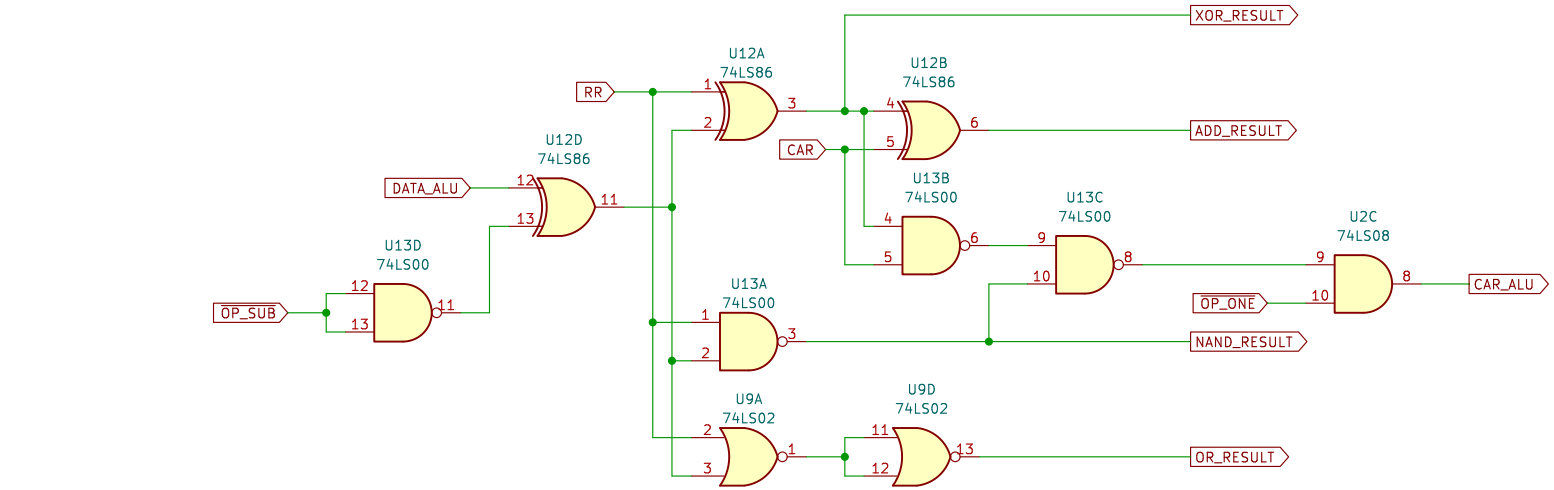


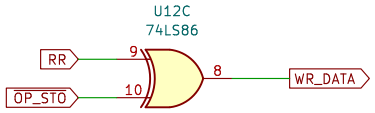
Registers

Sheet: /Registers/
File: registers.kicad_sch

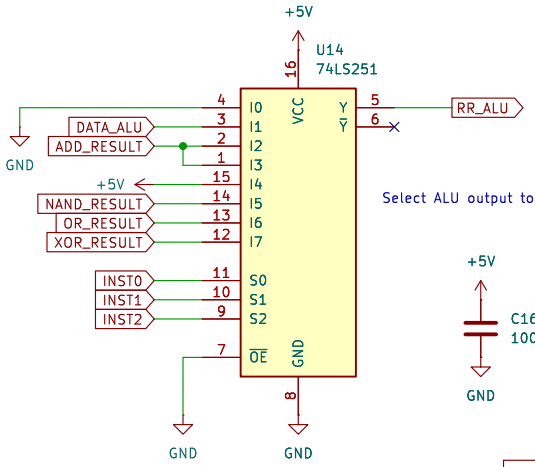
Title: UE14500 TTL 1-bit Microprocessor

Size: A4 | Date: 2025 | **Rev: 1**
KiCad E.D.A. 8.0.9 | Id: 4/6



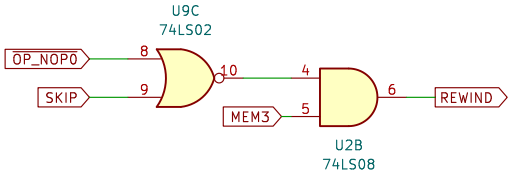


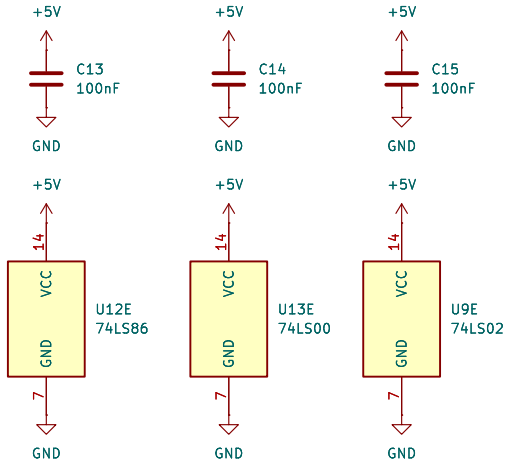
Pass RR through as-is for STO, or invert it for STOC



Select ALU output to store to RR

NOP0's $08 to $0F can be used as a "rewind" signal to the tape to cause it to wrap around early.



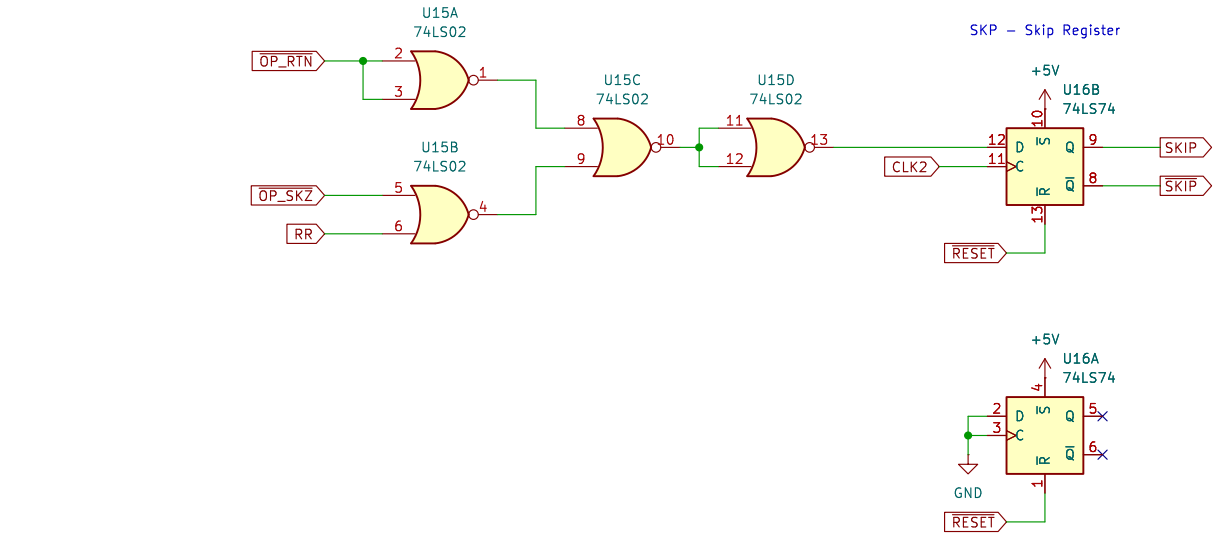


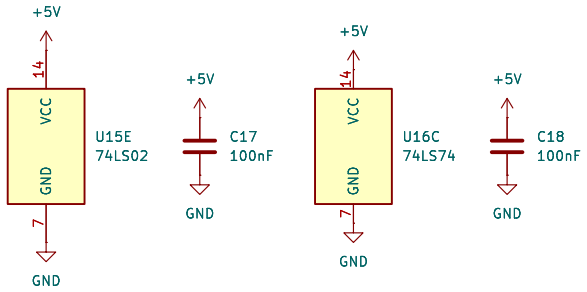
Arithmetic and Logic Unit

Sheet: /ALU/
File: ALU.kicad_sch

Title: UE14500 TTL 1-bit Microprocessor

Size: A4	Date: 2025	**Rev: 1**
KiCad E.D.A. 8.0.9		Id: 5/6





Skip Register

Sheet: /Skip Register/
File: skip_register.kicad_sch

Title: UE14500 TTL 1-bit Microprocessor

Size: A4	Date: 2025	**Rev: 1**
KiCad E.D.A. 8.0.9		Id: 6/6