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(C) TOM STOREY

Sheet: /CPU/

File: cpu.kicad\_sch

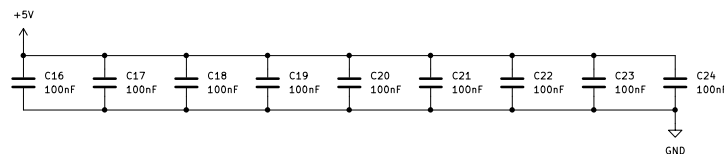
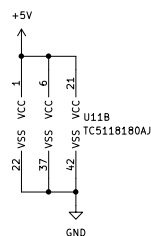
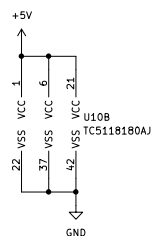
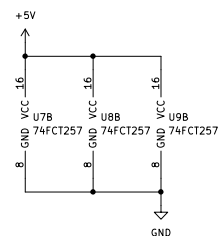
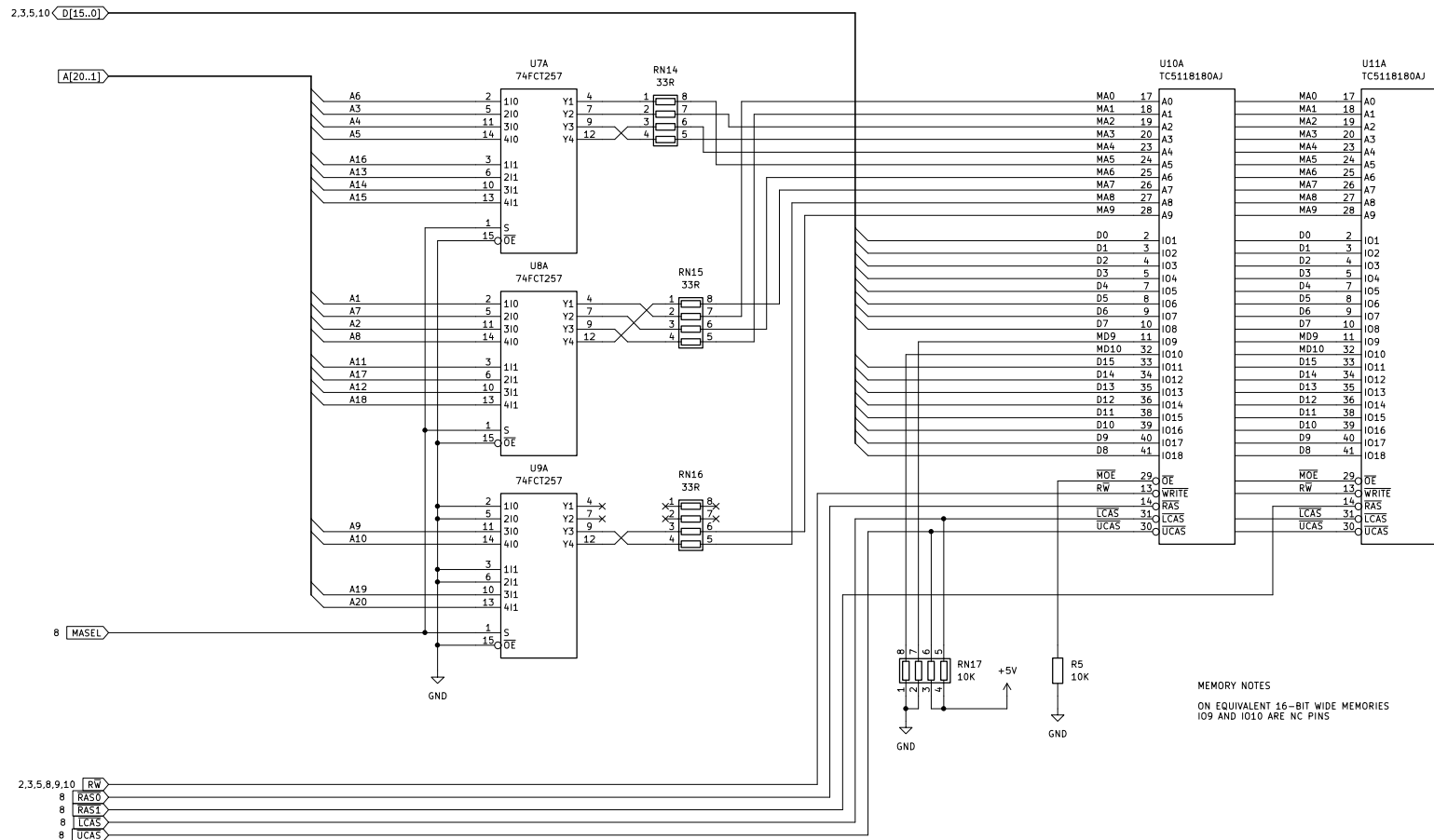
Title: CPU

Size: A3 Date: 2023-11-02

Rev: 2

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(C) TOM STOREY

Sheet: /Memory/

File: memory.kicad\_sch

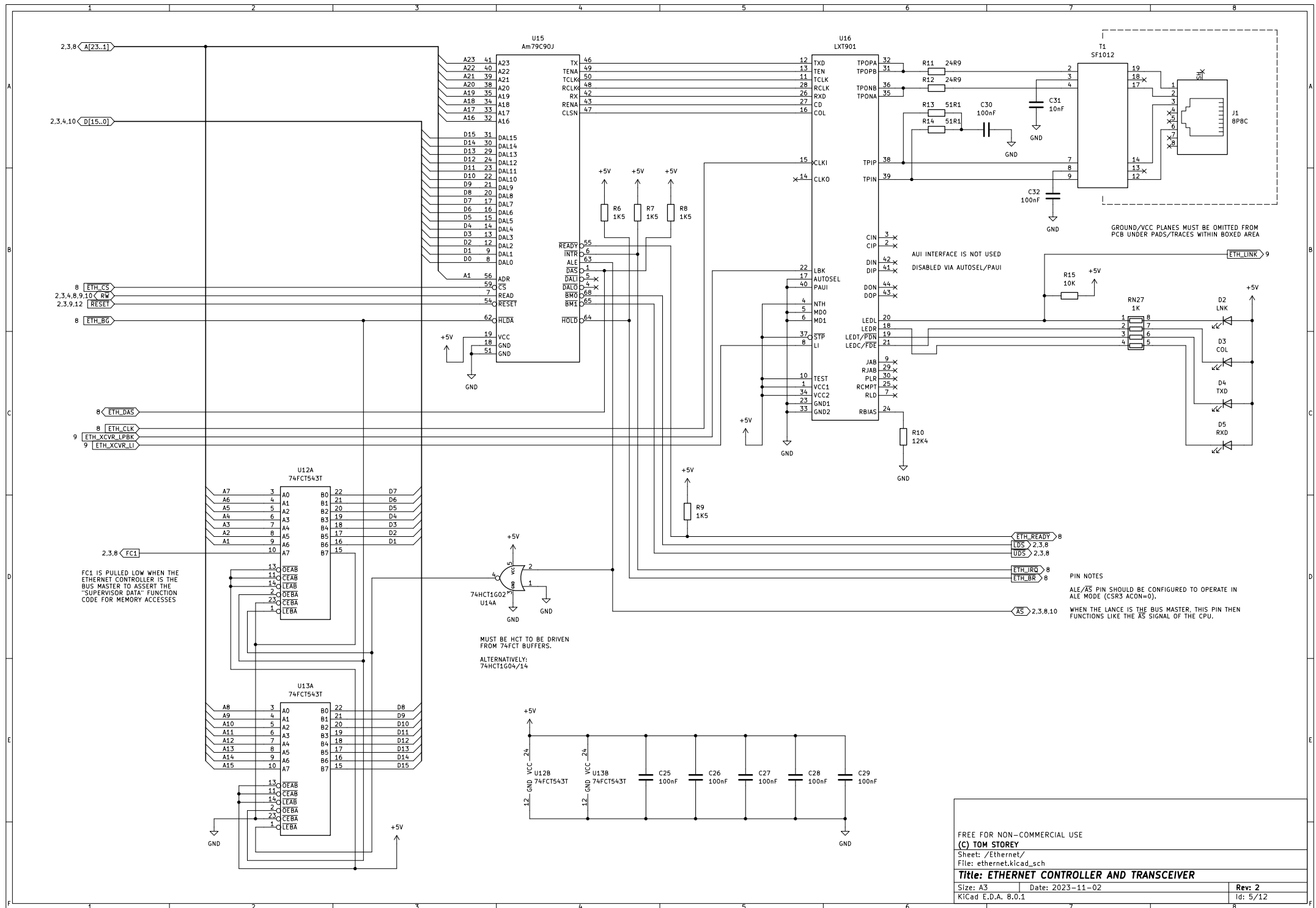
**Title: MEMORY**

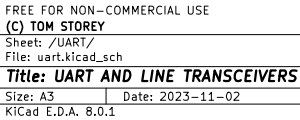
Size: A3 Date: 2023-11-02

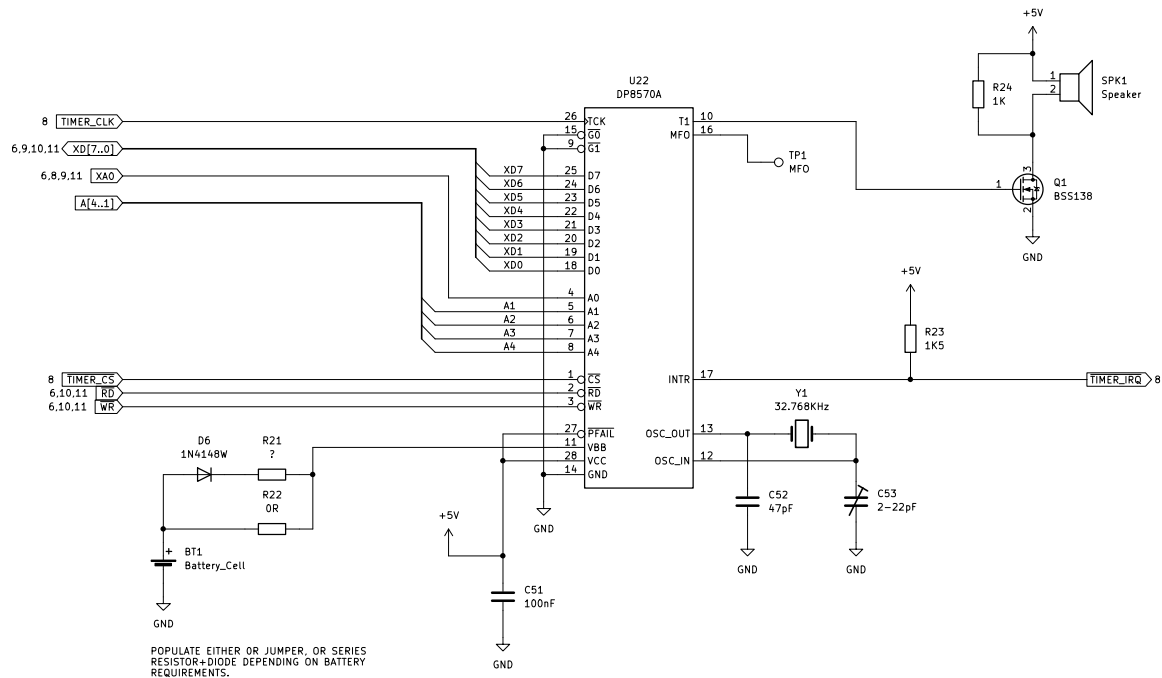
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Rev: 2

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(C) TOM STOREY

Sheet: /Timer & RTC/

File: timer\_rtc.kicad\_sch

**Title: RTC/TIMERS AND SPEAKER**

Size: A3 Date: 2023-11-02

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Rev: 2

Id: 7/12





## IO DECODE SUMMARY

OFFSET	WRITE	READ	FUNCTION
0	X	X	READ/WRITE CONTROL/STATUS REGISTER 1
1	X	X	READ/WRITE CONTROL/STATUS REGISTER 2
2	X	X	READ CONTROL/STATUS REGISTER 3
3	X	X	WATCHDOG TIMER RESET
3	X	X	SOFTWARE RESET (IF ENABLED VIA CSR 2)

## CONTROL/STATUS REGISTER 1

RW-x	RW-x	RW-x	RW-x	RW-x	RW-x	RW-x	RW-x
SOFT_IRQ	CPLD_FUNC1	ETH_LI	ETH_LPBK	LED_D	LED_C	LED_B	LED_A
BIT 7							BIT 0

BIT 7	SOFT_IRQ: SOFTWARE IRQ 1 = INTERRUPT REQUESTED 0 = INTERRUPT NOT REQUESTED	BIT 3	LED_D: LED D CONTROL 1 = LED OFF 0 = LED ON
BIT 6	CPLD_FUNC1: CPLD FUNCTION 1 1 = CPLD FUNCTION 1 PIN IS HIGH 0 = CPLD FUNCTION 1 PIN IS LOW	BIT 2	LED_C: LED C CONTROL 1 = LED OFF 0 = LED ON
BIT 5	ETH_LI: ETHERNET LINK INTEGRITY TEST 1 = LINK INTEGRITY TEST ENABLED 0 = LINK INTEGRITY TEST DISABLED	BIT 1	LED_B: LED B CONTROL 1 = LED OFF 0 = LED ON
BIT 4	ETH_LPBK: ETHERNET LOOPBACK 1 = LOOPBACK ENABLED 0 = LOOPBACK DISABLED	BIT 0	LED_A: LED A CONTROL 1 = LED OFF 0 = LED ON

## CONTROL/STATUS REGISTER 2

R-1	R-0	RW-0	RW-0	R-x	R-x	R-x	R-x
POR	WDTO	SOFT_RST_EN	WDT_EN	CONFIG3	CONFIG2	CONFIG1	CONFIG0
BIT 7							BIT 0

BIT 7	POR: POWER ON RESET FLAG (1)(3)(5) 1 = POWER ON RESET OCCURRED 0 = NORMAL RESET	BIT 4	WDT_EN: WATCHDOG TIMER ENABLE (4) 1 = WATCHDOG IS ENABLED 0 = WATCHDOG IS DISABLED
BIT 6	WDTO: WATCHDOG TIMEOUT FLAG (2)(3)(5) 1 = WATCHDOG TIMEOUT CAUSED RESTART 0 = NORMAL RESET	BIT 3-0	CONFIG3_0: CONFIGURATION JUMPERS 1 = OPEN, JUMPER NOT INSTALLED 0 = CLOSED, JUMPER INSTALLED
BIT 5	SOFT_RST_EN: SOFTWARE RESET ENABLE (4) 1 = SOFTWARE RESET MAY BE INITIATED 0 = SOFTWARE RESET IS INHIBITED		

NOTE 1: BIT IS SET DURING POWER UP, OR BROWNOUT IF VOLTAGE DROPS TO 4V OR LESS.  
NOTE 2: BIT IS SET IN THE EVENT OF A WATCHDOG TIMEOUT. BIT IS CLEARED BY POR OR BROWNOUT.  
NOTE 3: BIT IS CLEARED AFTER CONTROL/STATUS REGISTER 2 IS READ.  
NOTE 4: BIT IS CLEARED FOLLOWING ANY RESET CAUSE.  
NOTE 5: REFER TO RESET SHEET FOR NOTES ABOUT RESET CAUSE FLAG LIMITATIONS.

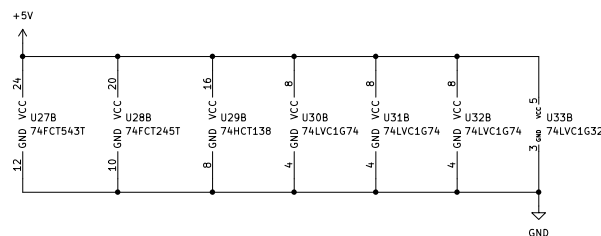
## CONTROL/STATUS REGISTER 3

U	U	U	U	U	U	U	R-x
							ETH_LNK
BIT 7							BIT 0

BIT 7-1 UNIMPLEMENTED

BIT 0 ETH\_LNK: ETHERNET LINK STATUS  
1 = NO LINK DETECTED  
0 = LINK DETECTED

LEGEND:  
R = READABLE BIT  
-n = VALUE AT POR  
W = WRITABLE BIT  
1 = BIT IS SET  
U = UNIMPLEMENTED BIT  
0 = BIT IS CLEARED  
x = BIT IS UNKNOWN



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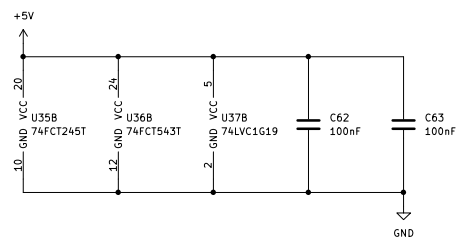
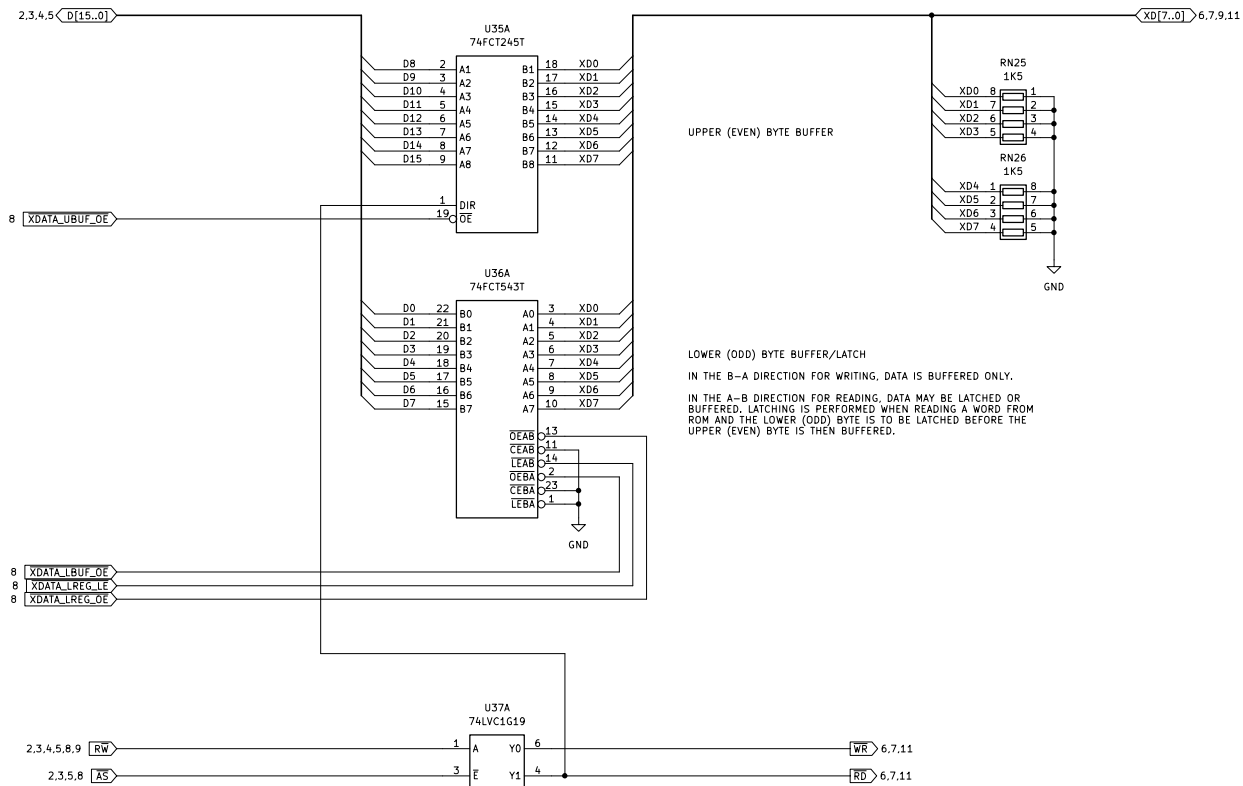
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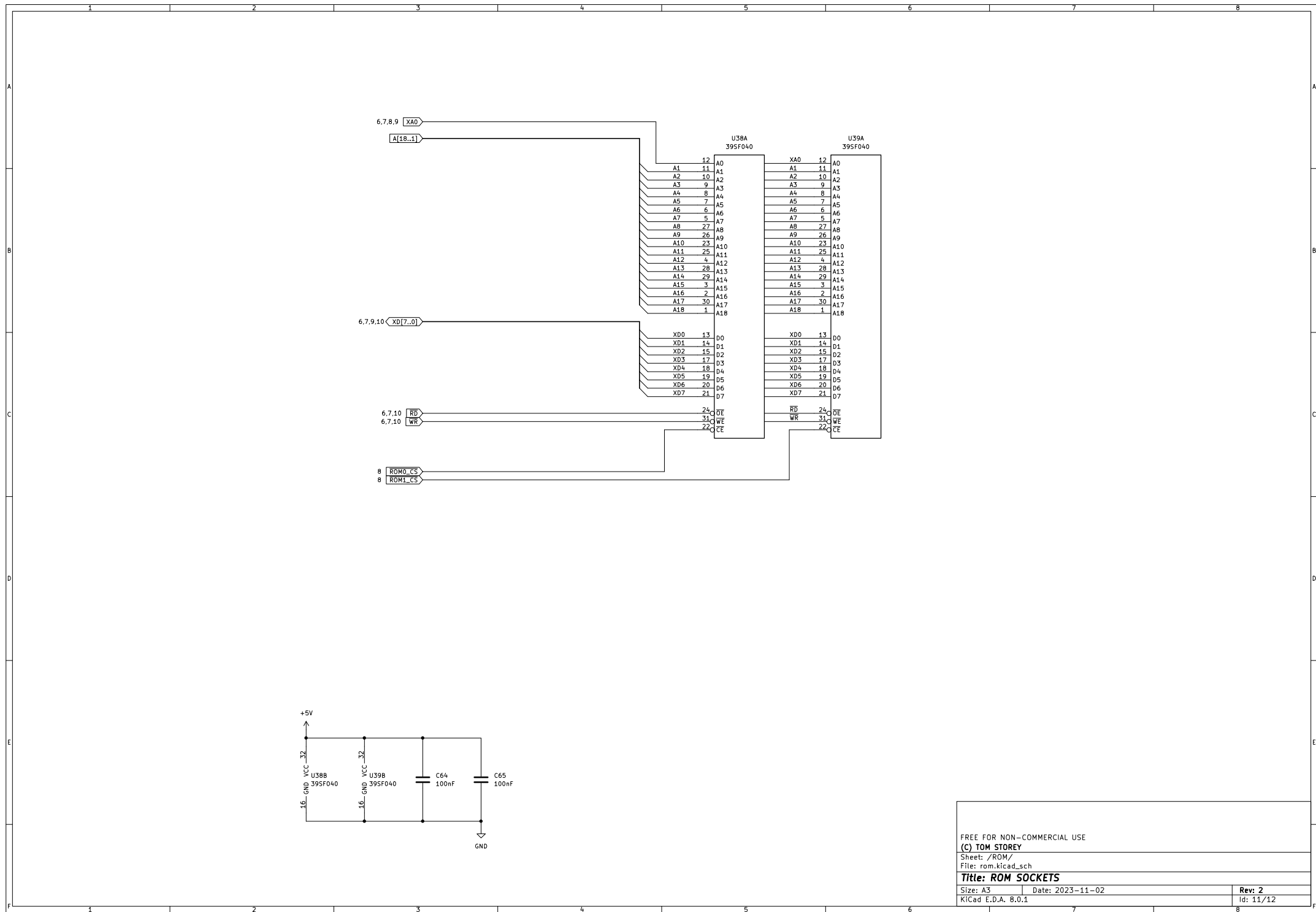
Sheet: /Onboard IO/  
File: onboard\_io.kicad\_sch

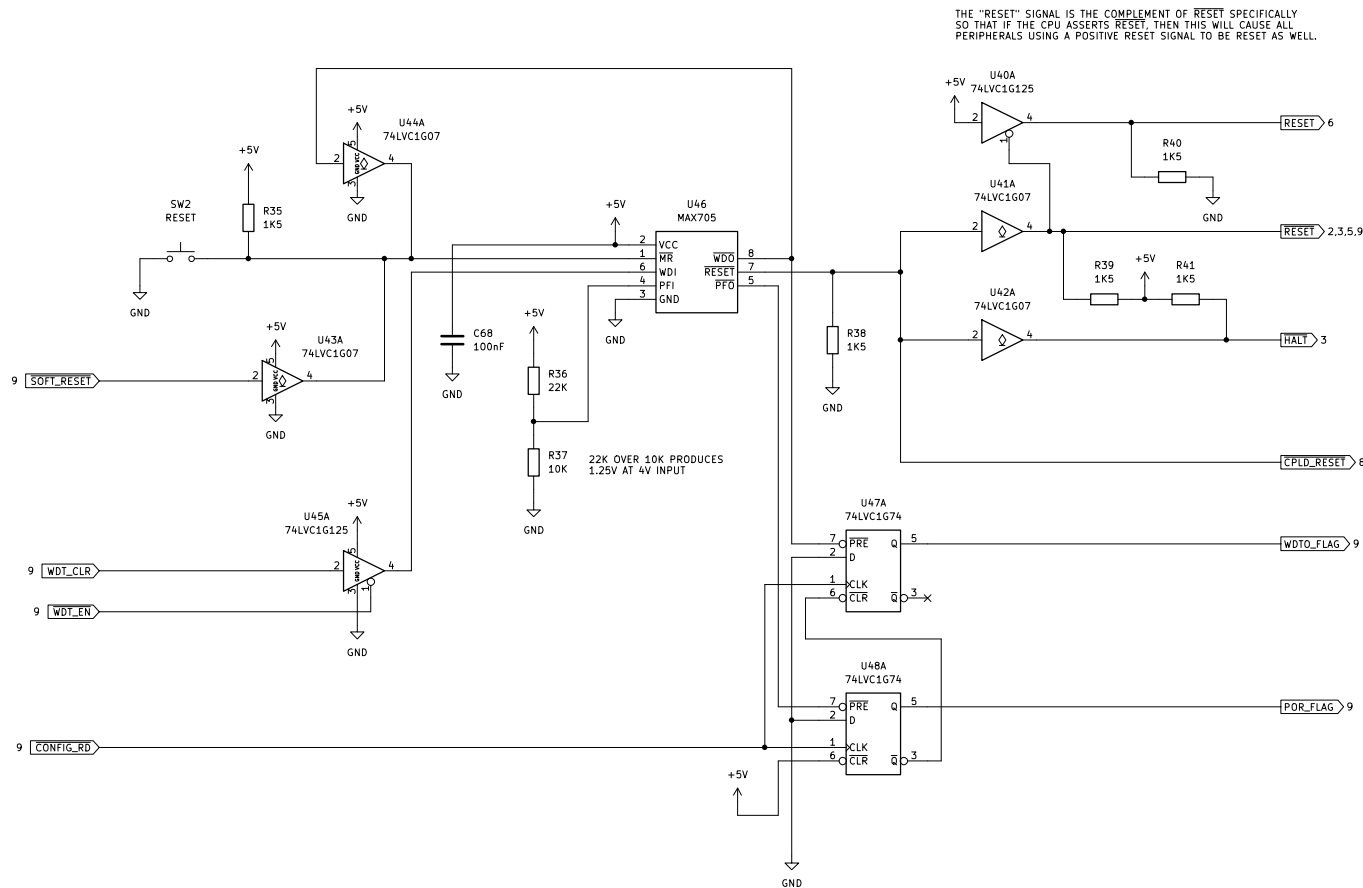
Title: ON-BOARD I/O PORTS

Size: A3 Date: 2023-11-02  
KiCad E.D.A. 8.0.1

Rev: 2  
Id: 9/12







#### RESET CAUSE TRUTH TABLE

POR	WDTO	CAUSE (NOTE)
0	0	SOFTWARE, PUSHBUTTON OR VOLTAGE THRESHOLD (1)
0	1	WATCHDOG TIMEOUT (2)
1	0	POWER ON RESET OR BROWNOUT ( $V_{CC} < 4V$ ) (3)
1	1	INVALID COMBINATION

SOFTWARE MUST READ THE CONTROL/STATUS REGISTER CONTAINING THE RESET CAUSE BITS ON EACH STARTUP TO ENSURE THAT THE STATUS BITS REPRESENT THE MOST RECENT RESET CAUSE. FAILURE TO DO SO MAY RESULT IN AN INCORRECT RESET CAUSE BEING RECOGNISED. SEE LIMITATIONS MENTIONED BELOW.

#### NOTES:

1. A VOLTAGE THRESHOLD RESET DOES NOT SET ANY STATUS BITS AND IS CONSIDERED THE SAME AS A SOFTWARE OR PUSHBUTTON RESET EVENT. A POWER ON RESET OR BROWNOUT WHERE  $V_{CC}$  DROPS BELOW 4V WILL SET THE POR FLAG. TO FURTHER CORRELATE RESET EVENT CAUSES, A SOFTWARE INITIATED RESET MAY BE TRACKED THROUGH THE USE OF A PERSISTENT VARIABLE IN MEMORY AS DRAM REFRESHING IS MAINTAINED THROUGH ALL RESET EVENTS EXCEPT FOR POR/BROWNOUT.
2. A WATCHDOG TIMEOUT RESET EVENT CANNOT BE RECOGNISED AS LONG AS THE POR FLAG IS ACTIVE. THE WDTO FLAG IS RESET IN THE EVENT OF A POR/BROWNOUT RESET EVENT. THE WDTO FLAG IS NOT AFFECTED BY A SOFTWARE/PUSHBUTTON/VOLTAGE THRESHOLD RESET EVENT.
3. THE POR FLAG CAN ONLY BE RESET BY READING THE RESET STATUS BITS FROM THEIR CORRESPONDING CONTROL/STATUS REGISTER. THE POR FLAG IS NOT AFFECTED BY A SOFTWARE/PUSHBUTTON/VOLTAGE THRESHOLD RESET EVENT, AND WHEN ACTIVE PREVENTS THE WDTO FLAG FROM BEING SET IN THE EVENT OF A WATCHDOG TIMEOUT RESET.

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(C) TOM STOREY

Sheet: /Reset/

File: reset.kicad\_sch

**Title: RESET, VOLTAGE SUPERVISOR, WATCHDOG**

Size: A3

Date: 2023-11-02

Rev: 2

KiCad E.D.A. 8.0.1

Id: 12/12