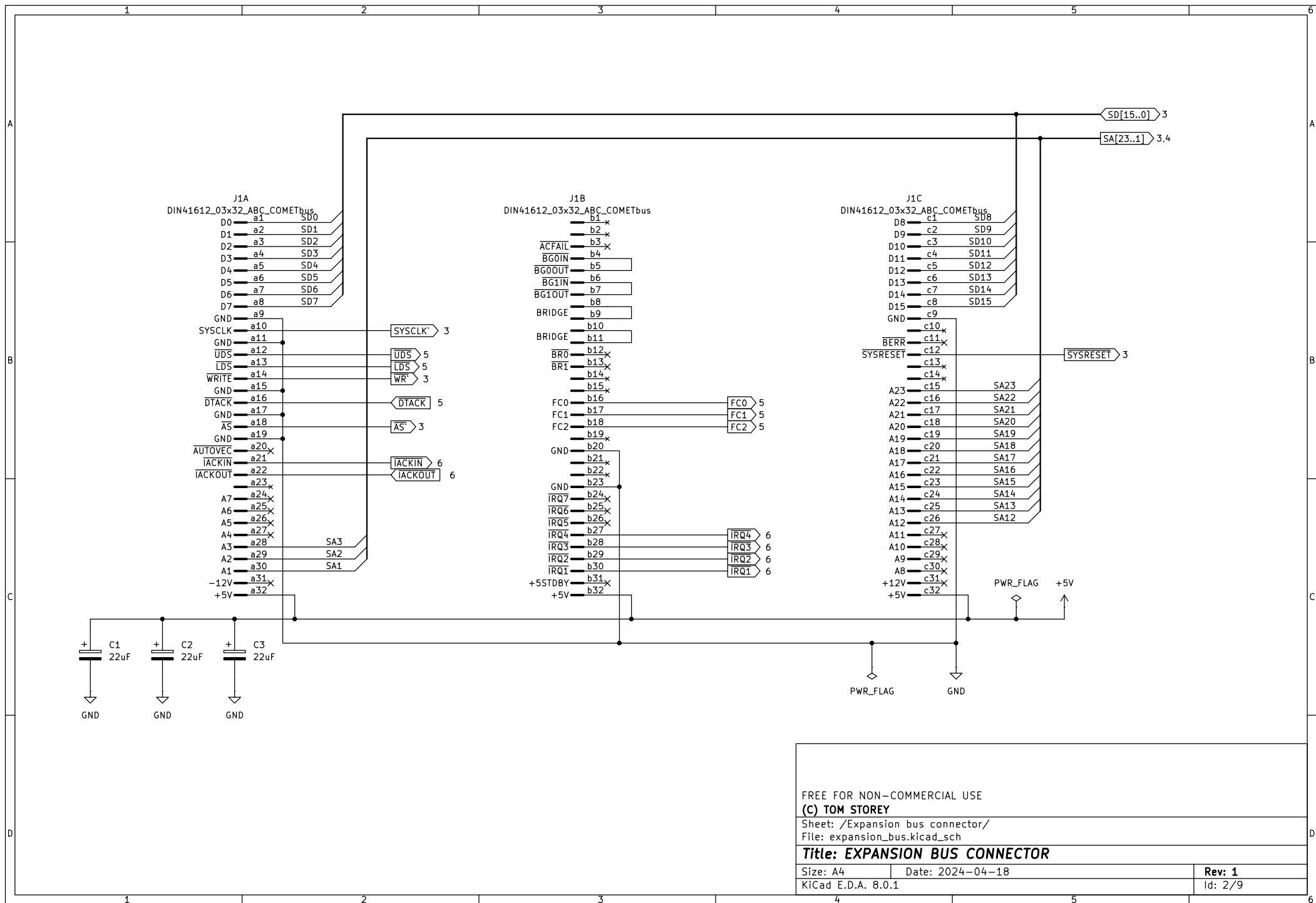
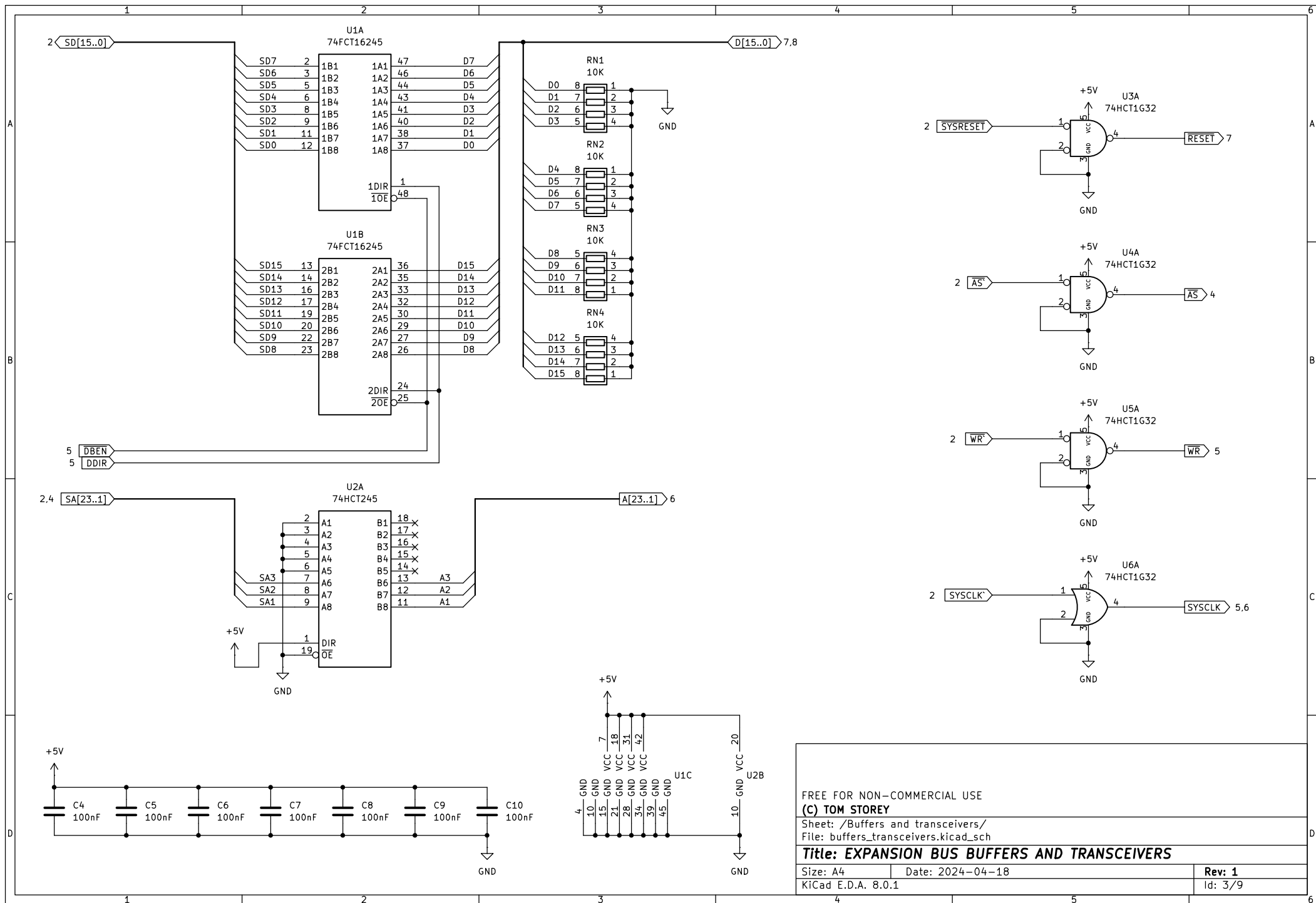


1	2	3	4	5	6
A	<div>Expansion bus connector</div> <div>File: expansion_bus.kicad_sch</div>	<div>Buffers and transceivers</div> <div>File: buffers_transceivers.kicad_sch</div>	<div>Address decoding</div> <div>Sheetfile: addr_decode.kicad_sch</div>	<div>Control GAL</div> <div>File: gal.kicad_sch</div>	<div>Interrupt logic</div> <div>File: interrupt.kicad_sch</div>
B	<div>Registers</div> <div>File: registers.kicad_sch</div>	<div>Printer port</div> <div>File: printer_port.kicad_sch</div>	<div>Register documentation</div> <div>File: reg_doc.kicad_sch</div>		
C					
D				<div>FREE FOR NON-COMMERCIAL USE (C) TOM STOREY Sheet: / File: Printer_Interface.kicad_sch Title: PARALLEL PRINTER INTERFACE</div> <div>Size: A4Date: 2024-04-18Rev: 1</div> <div>KiCad E.D.A. 8.0.1Id: 1/9</div>	
1	2	3	4	5	6





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Sheet: /Buffers and transceivers/
File: buffers_transceivers.kicad_sch

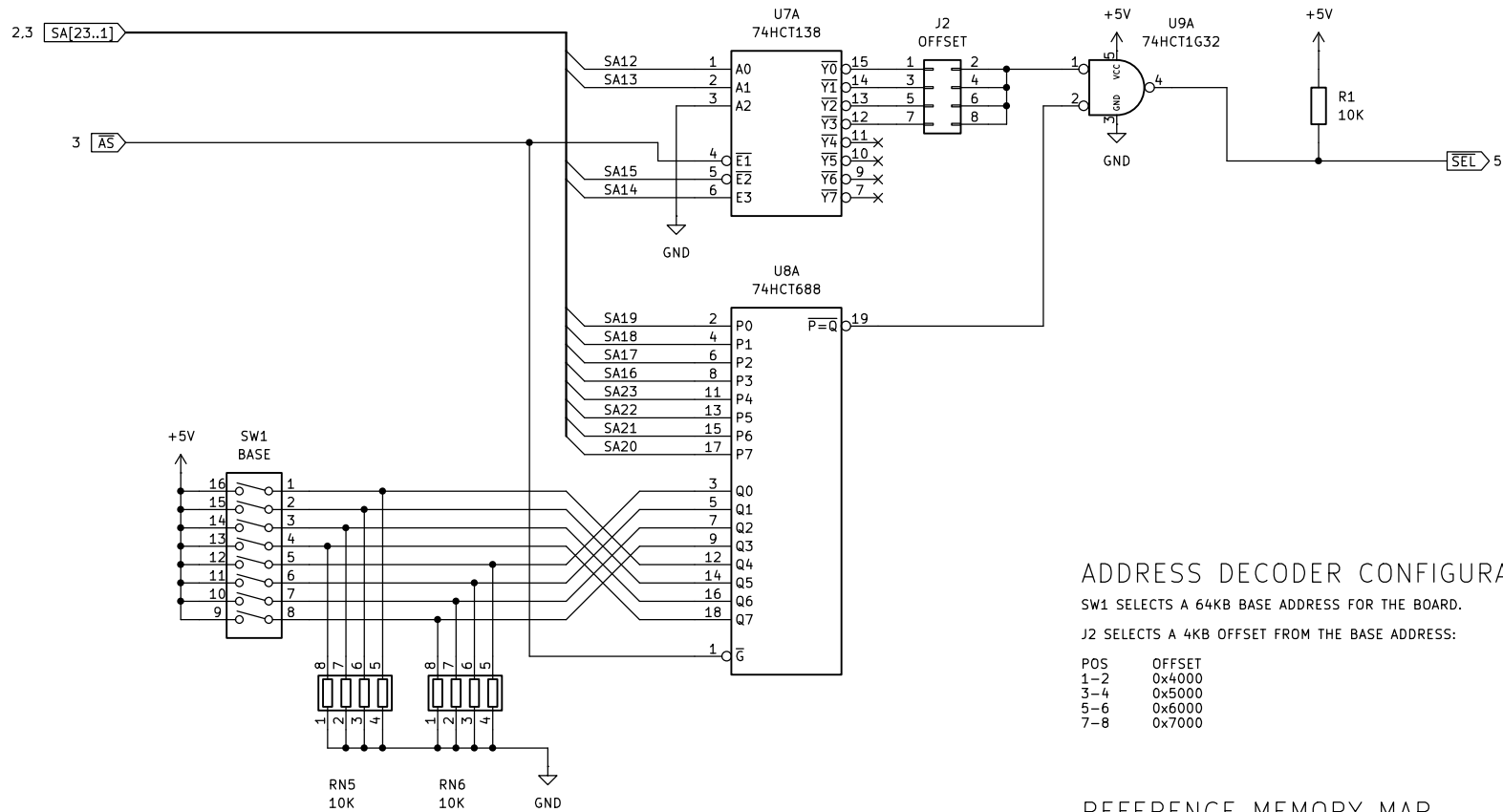
Title: EXPANSION BUS BUFFERS AND TRANSCEIVERS

Size: A4 Date: 2024-04-18

KiCad E.D.A. 8.0.1

Rev: 1

Id: 3/9



ADDRESS DECODER CONFIGURATION

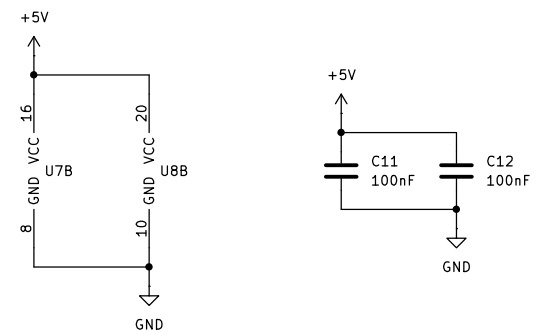
SW1 SELECTS A 64KB BASE ADDRESS FOR THE BOARD.

J2 SELECTS A 4KB OFFSET FROM THE BASE ADDRESS:

P05	OFFSET
1-2	0x4000
3-4	0x5000
5-6	0x6000
7-8	0x7000

REFERENCE MEMORY MAP

BASE ADDRESS + OFFSET +		DATA PORT
0	0x1	INTERRUPT VECTOR REGISTER
0x2	0x2	CONTROL REGISTER
0x3	0x3	STATUS REGISTER



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Sheet: /Address decoding/
File: addr_decode.kicad_sch

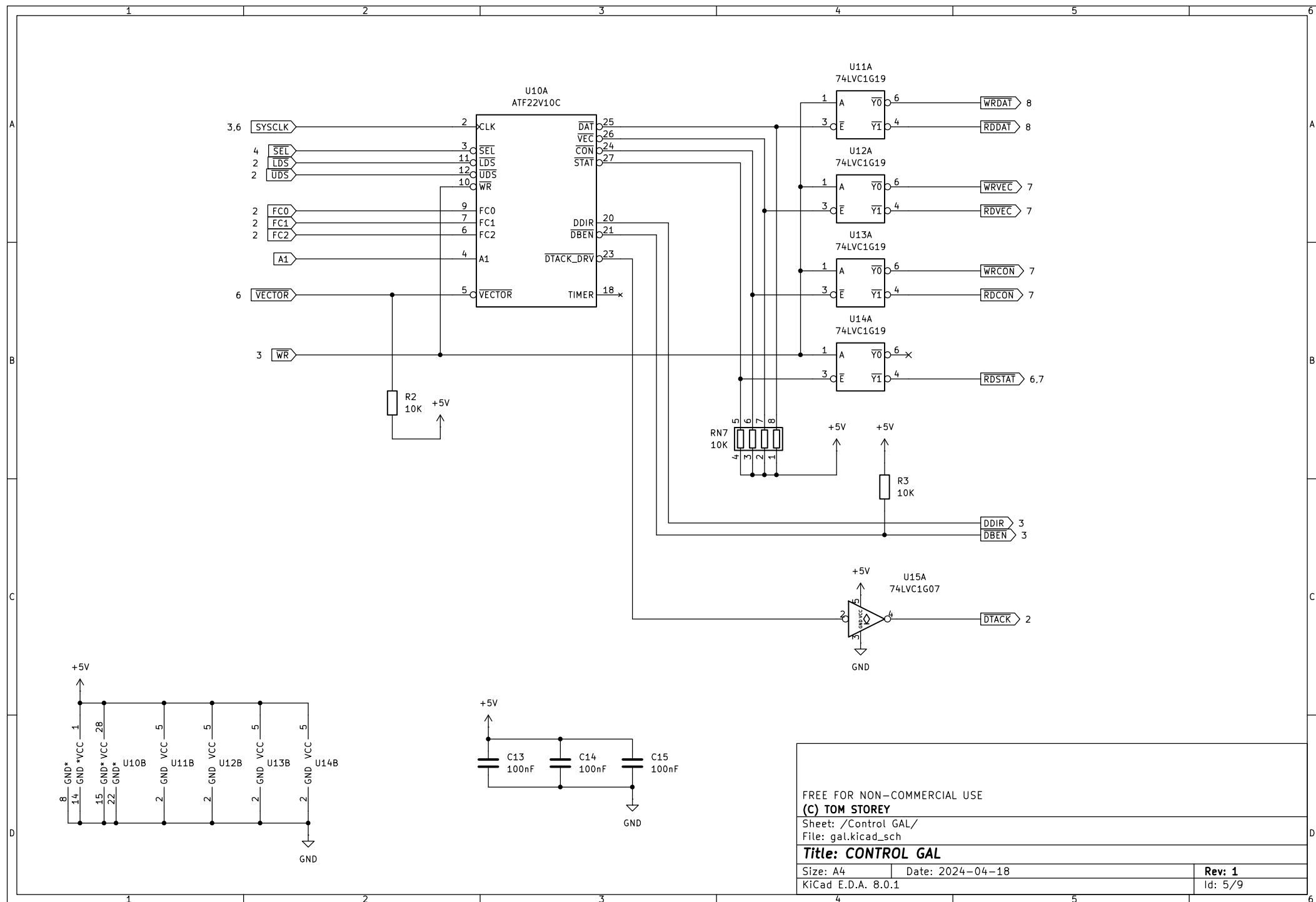
Title: ADDRESS DECODING

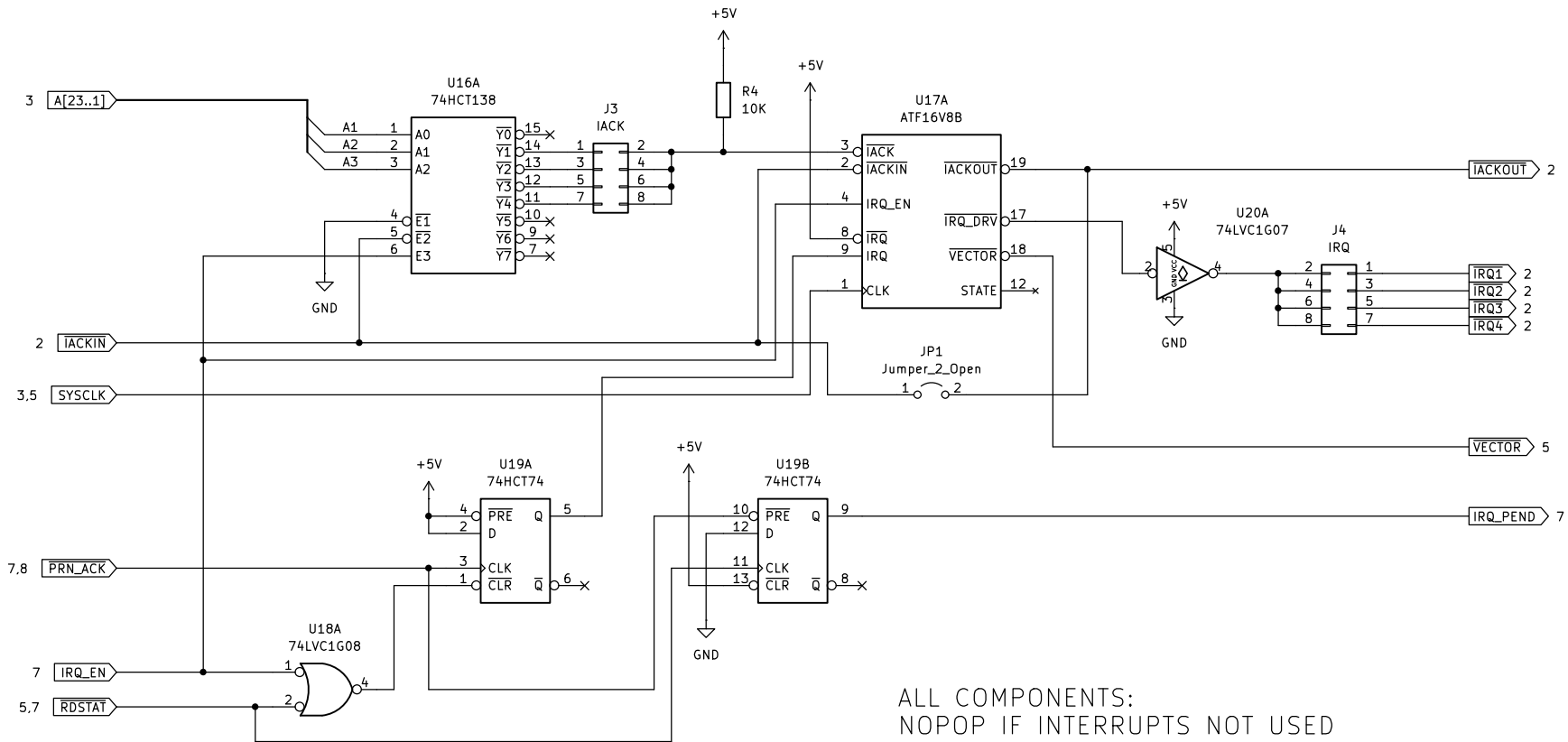
Size: A4 Date: 2024-04-18

KiCad E.D.A. 8.0.1

Rev: 1

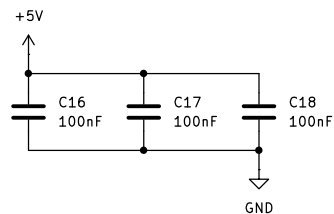
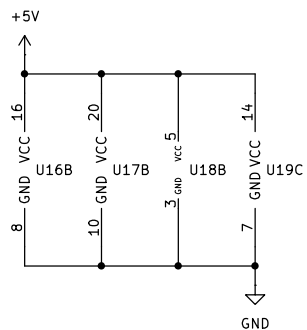
Id: 4/9





ALL COMPONENTS:
NOPOP IF INTERRUPTS NOT USED

BRIDGE JP1 IF INTERRUPTS NOT USED



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Sheet: /Interrupt logic/

File: interrupt.kicad_sch

Title: INTERRUPT LOGIC

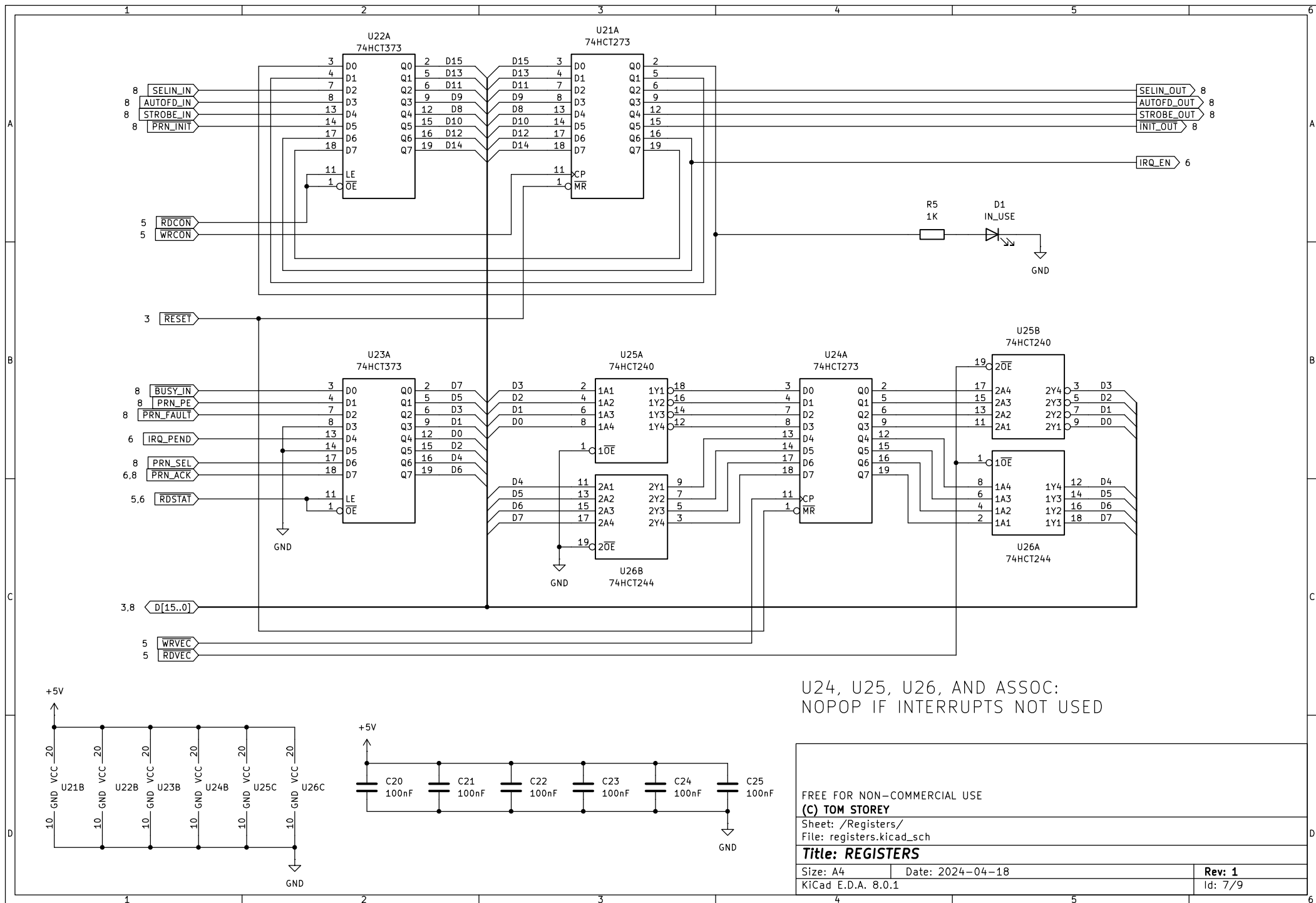
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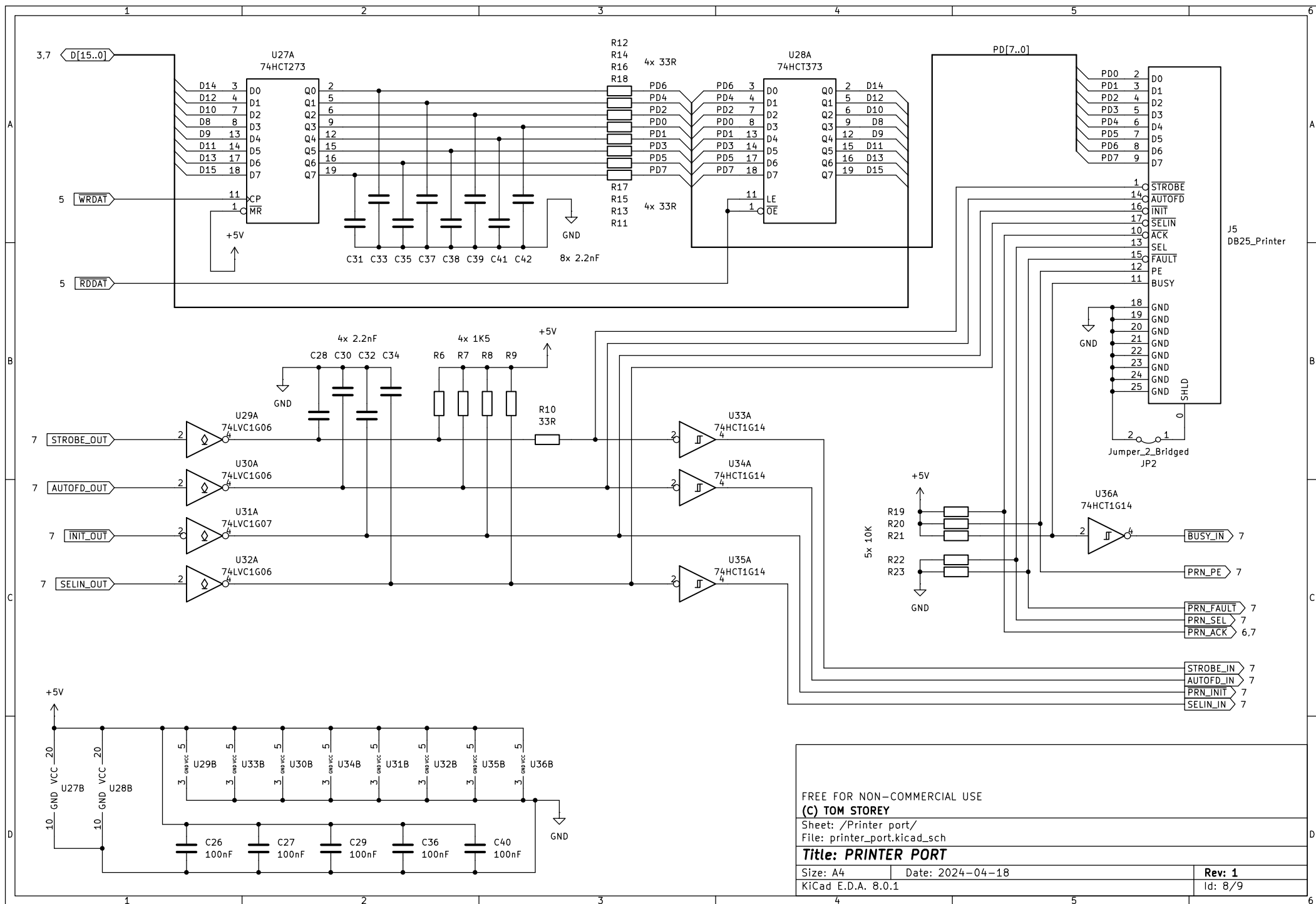
Date: 2024-04-18

Rev: 1

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Id: 6/9





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(C) TOM STOREY

Sheet: /Printer port/

File: printer_port.kicad_sch

Title: **PRINTER PORT**

Size: A4

Date: 2024-04-18

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Rev: 1

Id: 8/9

DATA PORT

RW-x	RW-x	RW-x	RW-x	RW-x	RW-x	RW-x	RW-x
D<7:0>							
BIT 7				BIT 0			

BIT 7-0 D<7:0>: INPUT/OUTPUT DATA
THE DATA PORT IS ALWAYS DRIVING AN OUTPUT VALUE, BUT AN EXTERNAL DEVICE MAY OVERRIDE THE OUTPUT DATA BY DRIVING THE DATA LINES TO AN ALTERNATE STATE.

THE OUTPUT VALUE AT RESET IS INDETERMINATE.

INTERRUPT VECTOR

RW-0	RW-0	RW-0	RW-0	RW-1	RW-1	RW-1	RW-1
VEC<7:0>							
BIT 7				BIT 0			

BIT 7-0 VEC<7:0>: INTERRUPT VECTOR
THIS IS THE VECTOR NUMBER THAT IS SUPPLIED TO THE CPU DURING THE INTERRUPT ACKNOWLEDGE CYCLE.

ON RESET, THE VECTOR NUMBER INITIALISES TO 0x0F TO SUPPLY THE "UNINITIALISED INTERRUPT" VECTOR. USER SOFTWARE MUST CONFIGURE AN APPROPRIATE VECTOR NUMBER FOR THE APPLICATION.

CONTROL REGISTER

RW-0	U-0	U-0	RW-0	RW-0	RW-0	RW-0	RW-0
IN_USE	-	-	IRQ_EN	SELIN	INIT	AUTOFD	STROBE
BIT 7				BIT 0			

BIT 7 IN_USE: IN USE LED CONTROL
1 = LED ON
0 = LED OFF

BIT 6-5 UNIMPLEMENTED

BIT 4 IRQ_EN: INTERRUPT REQUEST ENABLE
1 = INTERRUPT WILL BE GENERATED ON THE RISING EDGE OF \overline{ACK}
0 = INTERRUPTS ARE DISABLED

WHEN IRQ_EN IS CLEARED, INTERRUPT REQUESTS ARE INHIBITED BUT THE IRQ_PEND BIT OF THE STATUS REGISTER WILL STILL REFLECT PENDING INTERRUPT CONDITIONS. CLEARING IRQ_EN WHILE AN INTERRUPT REQUEST IS PENDING WILL CANCEL THE INTERRUPT REQUEST BUT DOES NOT CLEAR THE IRQ_PEND BIT OF THE STATUS REGISTER.

BIT 3 SELIN: PRINTER SELECT
1 = PRINTER IS SELECTED
0 = PRINTER IS NOT SELECTED

BIT 2 INIT: PRINTER RESET
1 = PRINTER IS IN NORMAL OPERATION
0 = PRINTER IS IN RESET STATE

BIT 1 AUTOFD: AUTOMATIC LINE-FEED MODE
1 = ENABLE AUTOMATIC LINE-FEED MODE
0 = DISABLE AUTOMATIC LINE-FEED MODE

BIT 0 STROBE: DATA TRANSFER STROBE
1 = ASSERT STROBE TOWARDS PRINTER TO LATCH DATA
0 = SIGNAL IS NEGATED

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

STATUS REGISTER

R-x	R-x	R-x	R-x	R-x	U-0	U-0	R-x
BUSY	ACK	ERROR	SELECT	FAULT	-	-	IRQ_PEND
BIT 7				BIT 0			

BIT 7 BUSY: PRINTER BUSY
1 = PRINTER IS READY TO RECEIVE NEW DATA
0 = PRINTER IS NOT READY TO RECEIVE NEW DATA

BIT 6 ACK: TRANSFER ACKNOWLEDGE
1 = SIGNAL IS NEGATED
0 = PRINTER IS ACKNOWLEDGING TRANSFER

THE FALLING EDGE OF \overline{ACK} CAUSES THE IRQ_PEND BIT TO BE SET. THE RISING EDGE OF \overline{ACK} CAUSES AN INTERRUPT REQUEST TO BE GENERATED AS LONG AS THE IRQ_EN BIT OF THE CONTROL REGISTER IS SET.

BIT 5 ERROR: PAPER ERROR
1 = PRINTER IS EXPERIENCING AN ERROR IN THE PAPER PATH
0 = NO ERROR CONDITION EXISTS

BIT 4 SELECT: PRINTER ONLINE INDICATOR
1 = PRINTER IS ONLINE
0 = PRINTER IS NOT ONLINE

BIT 3 FAULT: PRINTER FAULT INDICATOR
1 = NO FAULT CONDITION EXISTS
0 = PRINTER IS EXPERIENCING A FAULT

BIT 2-1 UNIMPLEMENTED

BIT 0 IRQ_PEND: INTERRUPT PENDING
1 = AN INTERRUPT IS CURRENTLY PENDING FOR THIS INTERFACE
0 = NO INTERRUPT PENDING

IRQ_PEND REMAINS SET AS LONG AS THE \overline{ACK} SIGNAL IS ASSERTED, AND IS CLEARED BY READING THE STATUS REGISTER ONCE \overline{ACK} IS NEGATED.

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(C) TOM STOREY

Sheet: /Register documentation/
File: reg_doc.kicad_sch

Title: REGISTER DOCUMENTATION

Size: A4 Date: 2024-04-18

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Rev: 1

Id: 9/9