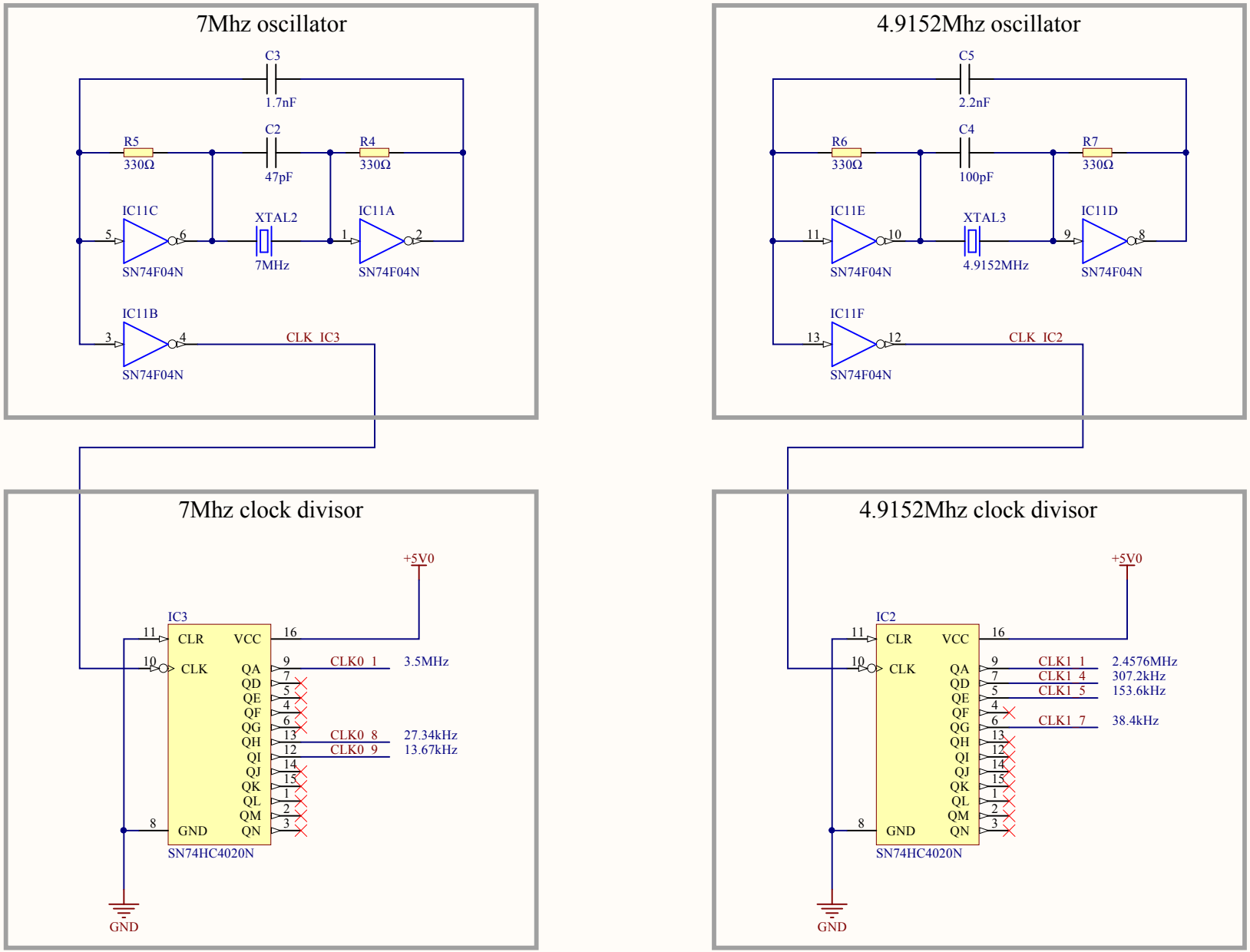
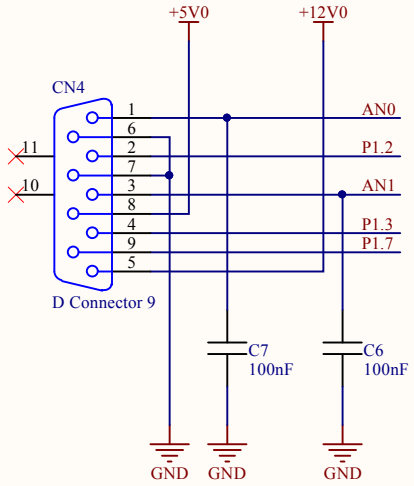
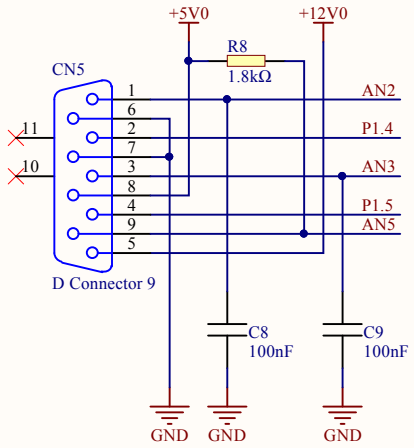

7Mhz oscillator
C3
1.7nF
R5
330Ω
C2
47pF
R4
330Ω
IC11C
XTAL2
IC11A
SN74F04N
7MHz
SN74F04N
IC11B
CLK_IC3
SN74F04N
4.9152Mhz oscillator
C5
2.2nF
R6
330Ω
C4
100pF
R7
330Ω
IC11E
XTAL3
IC11D
SN74F04N
4.9152MHz
SN74F04N
IC11F
CLK_IC2
SN74F04N
7Mhz clock divisor
+5V0
IC3
CLR
VCC
CLK
QA
CLK0_1
3.5MHz
QD
QE
QF
QG
QH
CLK0_8
27.34kHz
CLK0_9
13.67kHz
QI
QJ
QK
QL
QM
QN
GND
SN74HC4020N
GND
4.9152Mhz clock divisor
+5V0
IC2
CLR
VCC
CLK
QA
CLK1_1
2.4576MHz
QD
CLK1_4
307.2kHz
QE
CLK1_5
153.6kHz
QF
QG
CLK1_7
38.4kHz
QH
QI
QJ
QK
QL
QM
QN
GND
SN74HC4020N
GND

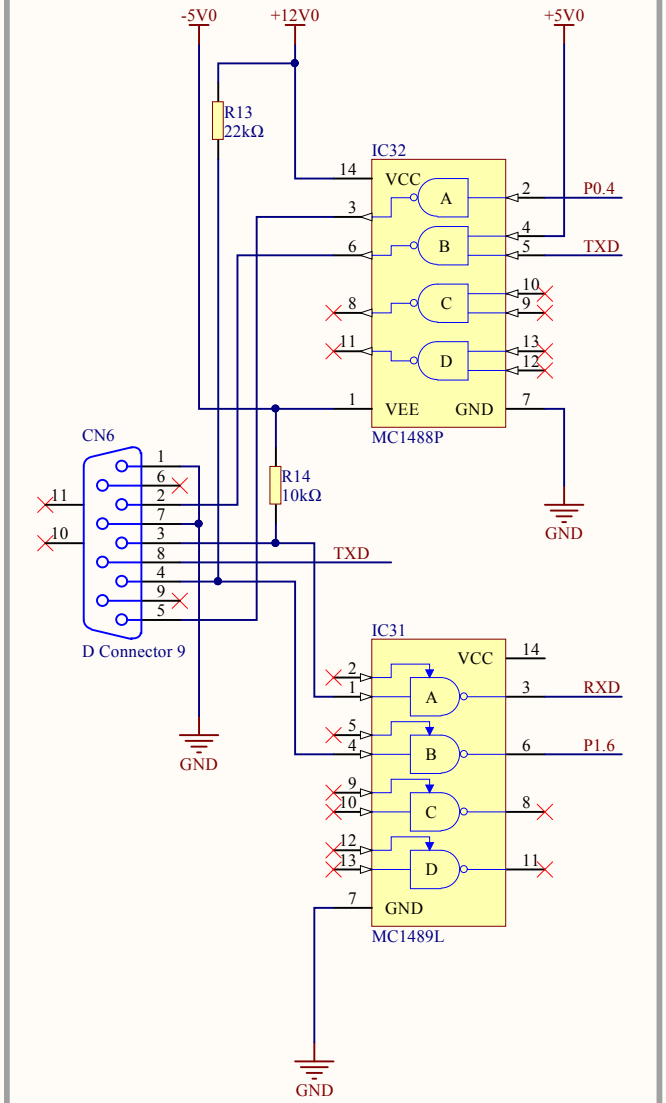
Side joystick connector



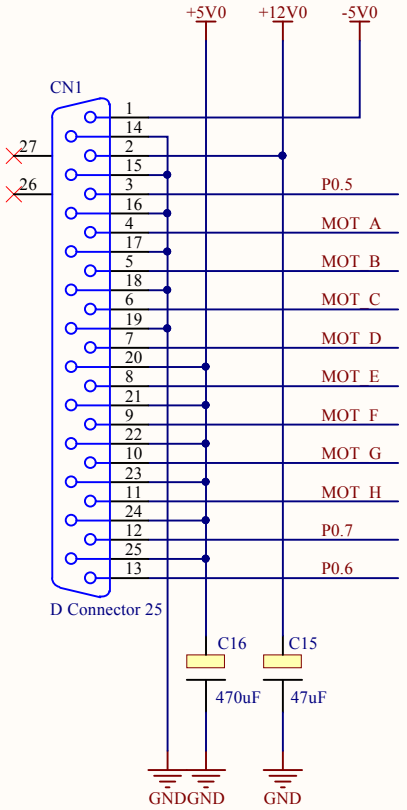
Center joystick connector



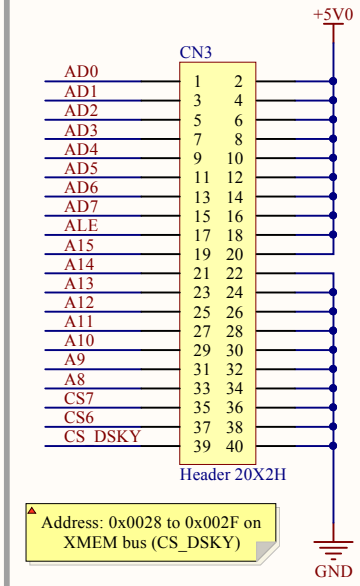
RS232/Serial port connector



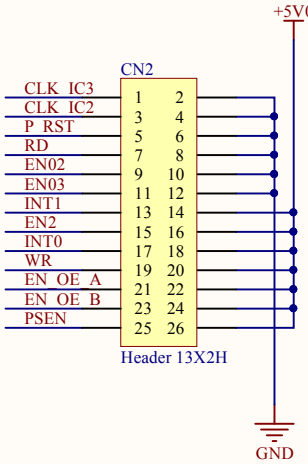
Power box connector

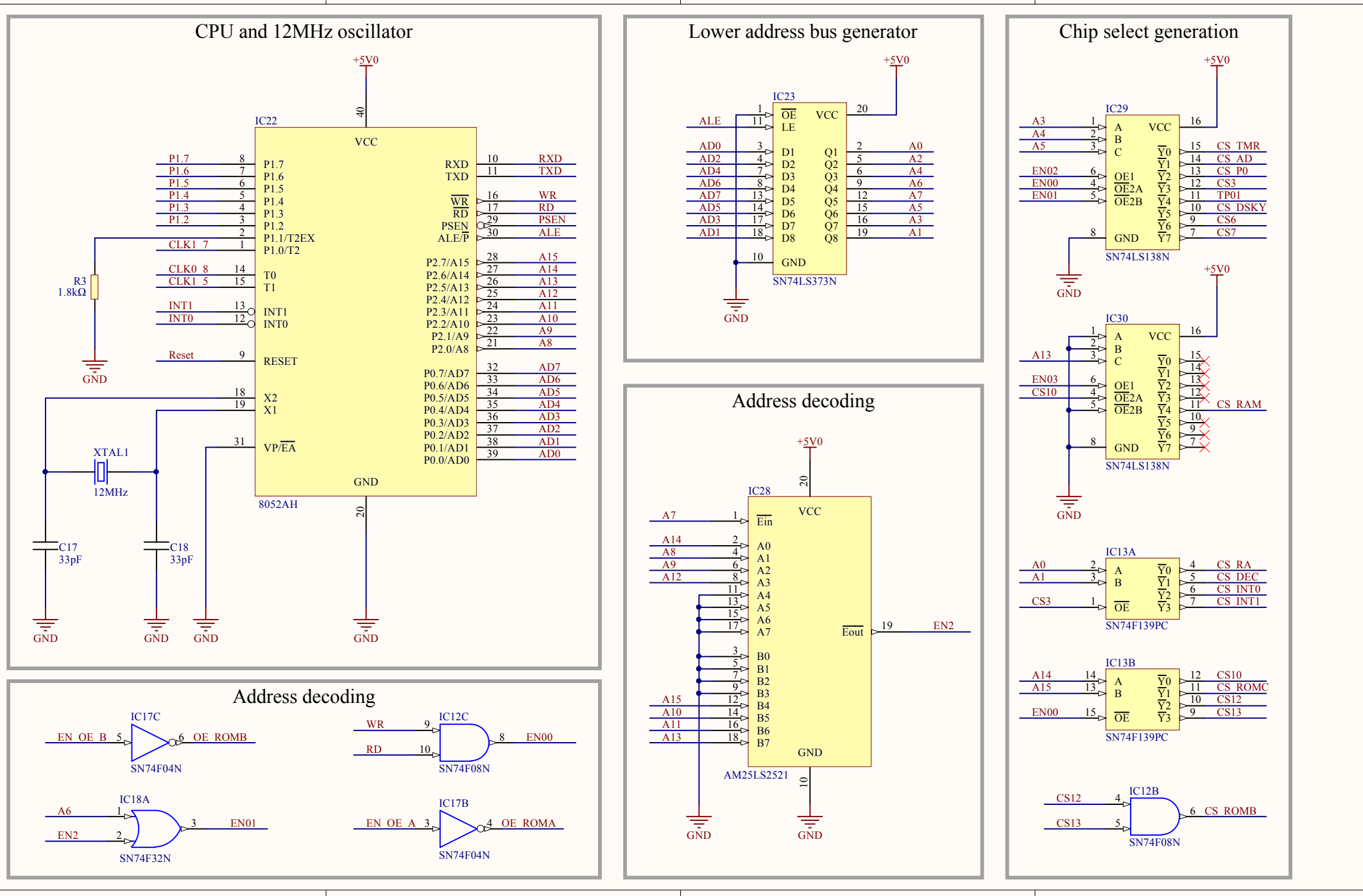


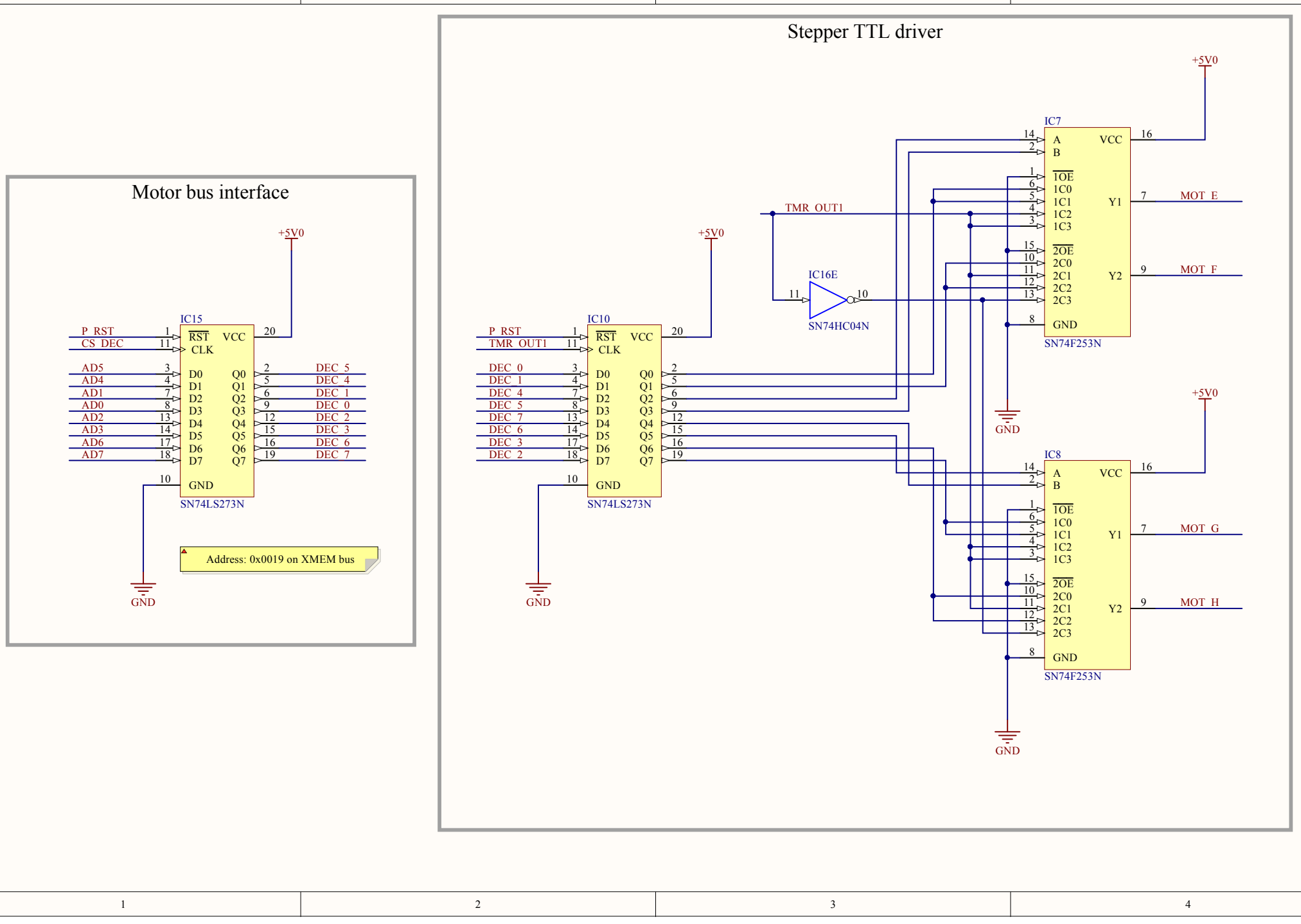
Internal display/keyboard connector

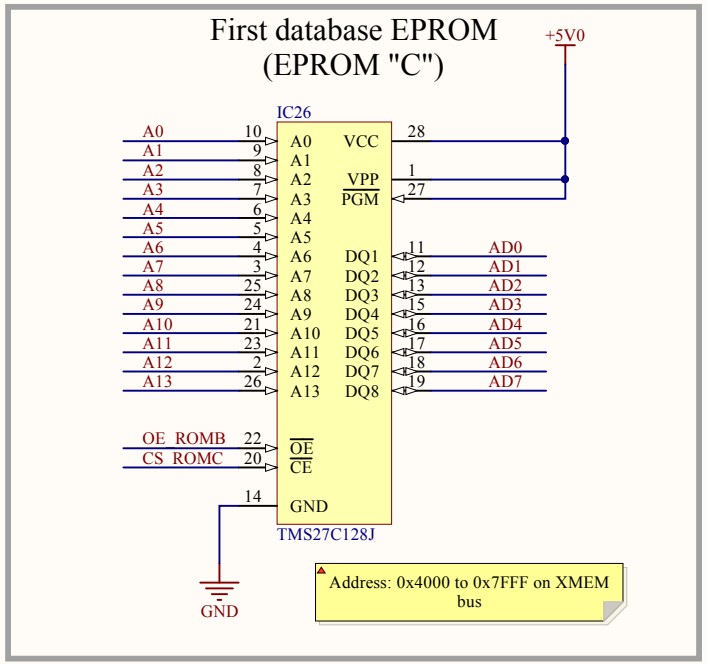


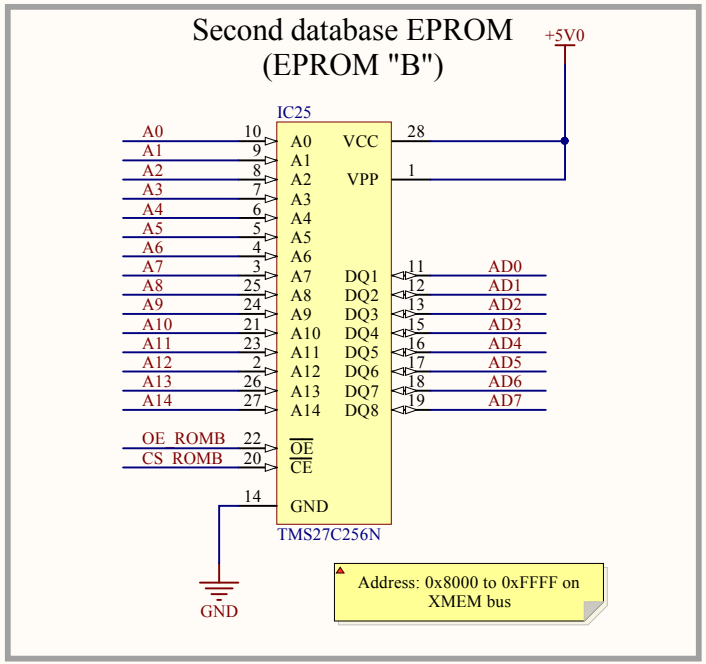
Internal debug(?) connector

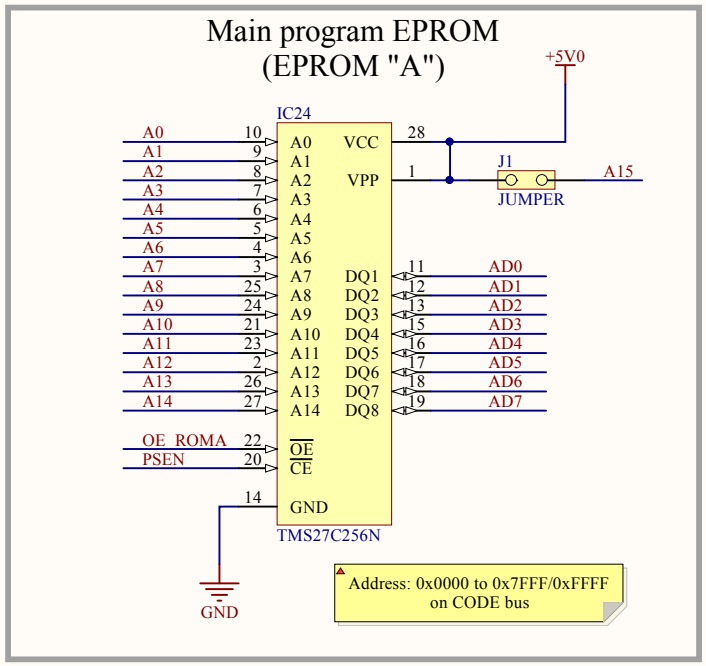


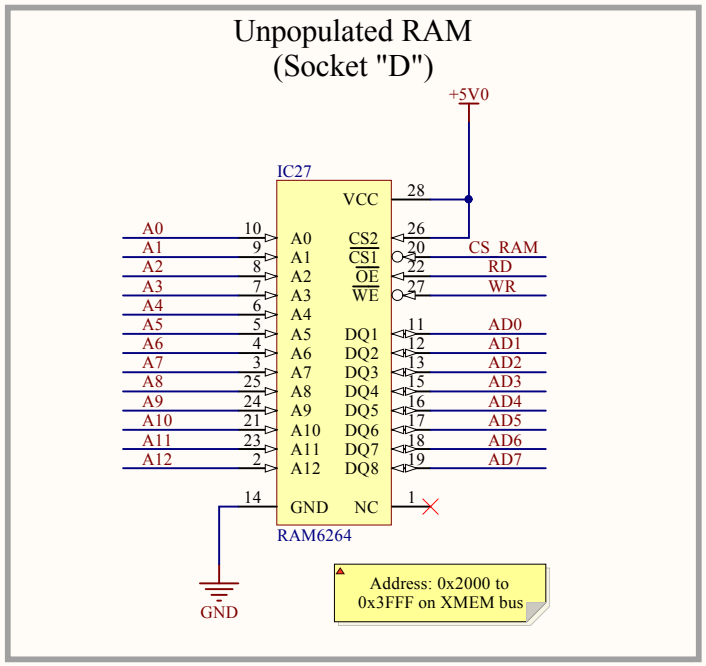

CPU and 12MHz oscillator
IC22
8052AH
+5V0
VCC
GND
P1.7
P1.6
P1.5
P1.4
P1.3
P1.2
P1.1/T2EX
P1.0/T2
T0
T1
INT1
INT0
RESET
X2
X1
VP/EA
RXD
TXD
WR
RD
PSEN
ALE/P
P2.7/A15
P2.6/A14
P2.5/A13
P2.4/A12
P2.3/A11
P2.2/A10
P2.1/A9
P2.0/A8
P0.7/AD7
P0.6/AD6
P0.5/AD5
P0.4/AD4
P0.3/AD3
P0.2/AD2
P0.1/AD1
P0.0/AD0
CLK1
CLK0
Reset
R3
1.8kΩ
XTAL1
12MHz
C17
33pF
C18
33pF
Lower address bus generator
IC23
SN74LS373N
ALE
AD0
AD2
AD4
AD6
AD7
AD5
AD3
AD1
Chip select generation
IC29
SN74LS138N
IC30
SN74LS138N
A3
A4
A5
EN02
EN00
EN01
A13
EN03
CS10
CS_TMR
CS_AD
CS_P0
CS3
TP01
CS_DSKY
CS6
CS7
CS_RAM
Address decoding
IC28
AM25LS2521
A7
A14
A8
A9
A12
A15
A10
A11
A13
Ein
Eout
EN2
IC13A
SN74F139PC
CS_RA
CS_DEC
CS_INT0
CS_INT1
IC13B
CS10
CS_ROMC
CS12
CS13
IC12B
SN74F08N
CS_ROMB
Address decoding
IC17C
SN74F04N
EN_OE_B
OE_ROMB
IC12C
WR
RD
EN00
IC18A
SN74F32N
A6
EN2
EN01
IC17B
EN_OE_A
OE_ROMA


Motor bus interface
+5V0
IC15
P_RST
CS_DEC
AD5
AD4
AD1
AD0
AD2
AD3
AD6
AD7
RST
CLK
D0
D1
D2
D3
D4
D5
D6
D7
VCC
GND
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
DEC_5
DEC_4
DEC_1
DEC_0
DEC_2
DEC_3
DEC_6
DEC_7
SN74LS273N
Address: 0x0019 on XMEM bus
GND
Stepper TTL driver
+5V0
IC10
P_RST
TMR_OUT1
DEC_0
DEC_1
DEC_4
DEC_5
DEC_7
DEC_6
DEC_3
DEC_2
SN74LS273N
GND
TMR_OUT1
IC16E
SN74HC04N
IC7
A
B
1OE
1C0
1C1
1C2
1C3
2OE
2C0
2C1
2C2
2C3
Y1
Y2
MOT_E
MOT_F
SN74F253N
GND
IC8
MOT_G
MOT_H
SN74F253N
GND

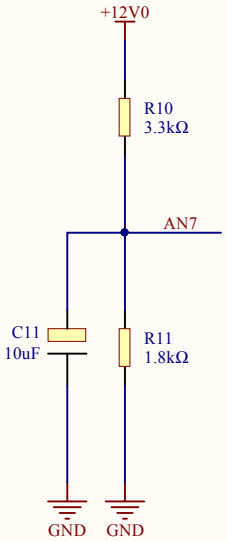

First database EPROM
(EPROM "C")
+5V0
IC26
A0 10
A1 9
A2 8
A3 7
A4 6
A5 5
A6 4
A7 3
A8 25
A9 24
A10 21
A11 23
A12 2
A13 26
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13
VCC 28
VPP 1
PGM 27
DQ1 11 AD0
DQ2 12 AD1
DQ3 13 AD2
DQ4 15 AD3
DQ5 16 AD4
DQ6 17 AD5
DQ7 18 AD6
DQ8 19 AD7
OE_ROMB 22
CS_ROMC 20
OE
CE
14 GND
TMS27C128J
GND
Address: 0x4000 to 0x7FFF on XMEM bus


Second database EPROM
(EPROM "B")
+5V0
IC25
A0 10
A1 9
A2 8
A3 7
A4 6
A5 5
A6 4
A7 3
A8 25
A9 24
A10 21
A11 23
A12 2
A13 26
A14 27
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14
VCC 28
VPP 1
DQ1 11 AD0
DQ2 12 AD1
DQ3 13 AD2
DQ4 15 AD3
DQ5 16 AD4
DQ6 17 AD5
DQ7 18 AD6
DQ8 19 AD7
OE_ROMB 22
CS_ROMB 20
OE
CE
14 GND
TMS27C256N
GND
Address: 0x8000 to 0xFFFF on XMEM bus


Main program EPROM
(EPROM "A")
+5V0
IC24
A0 10
A1 9
A2 8
A3 7
A4 6
A5 5
A6 4
A7 3
A8 25
A9 24
A10 21
A11 23
A12 2
A13 26
A14 27
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14
VCC 28
VPP 1
J1
JUMPER
A15
DQ1 11 AD0
DQ2 12 AD1
DQ3 13 AD2
DQ4 15 AD3
DQ5 16 AD4
DQ6 17 AD5
DQ7 18 AD6
DQ8 19 AD7
OE_ROMA 22
PSEN 20
OE
CE
14 GND
TMS27C256N
GND
Address: 0x0000 to 0x7FFF/0xFFFF on CODE bus

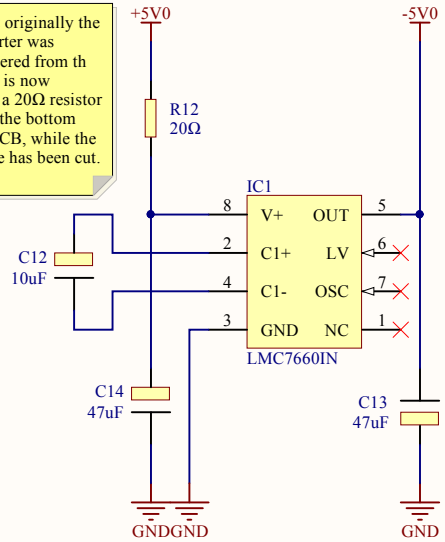

Unpopulated RAM
(Socket "D")
+5V0
IC27
A0 10
A1 9
A2 8
A3 7
A4 6
A5 5
A6 4
A7 3
A8 25
A9 24
A10 21
A11 23
A12 2
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12
VCC 28
CS2 26
CS1 20 CS_RAM
OE 22 RD
WE 27 WR
DQ1 11 AD0
DQ2 12 AD1
DQ3 13 AD2
DQ4 15 AD3
DQ5 16 AD4
DQ6 17 AD5
DQ7 18 AD6
DQ8 19 AD7
14 GND
NC 1
RAM6264
GND
Address: 0x2000 to 0x3FFF on XMEM bus

Power supply sensing

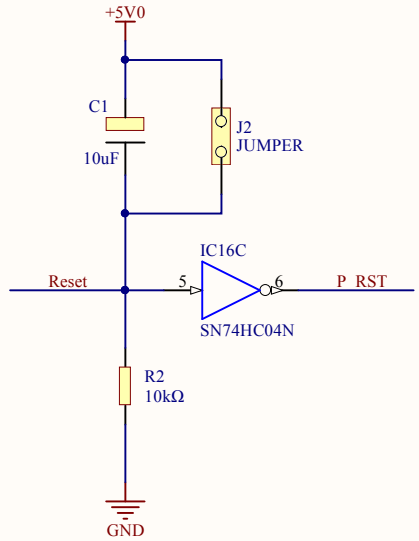


Voltage inverter

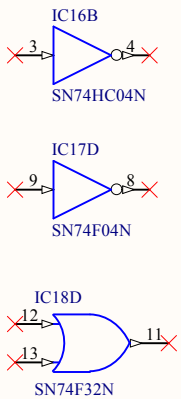
It seems that originally the voltage inverter was directly powered from th +5V0 rail. It is now powered via a 20Ω resistor mounted on the bottom side of the PCB, while the original trace has been cut.



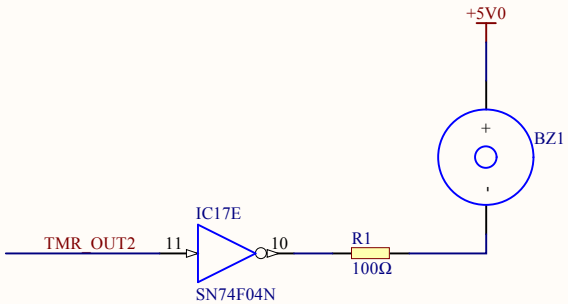
Reset circuit



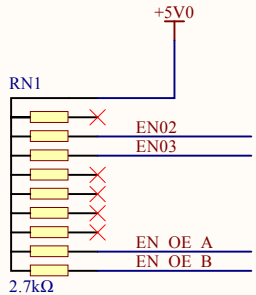
Unused ports



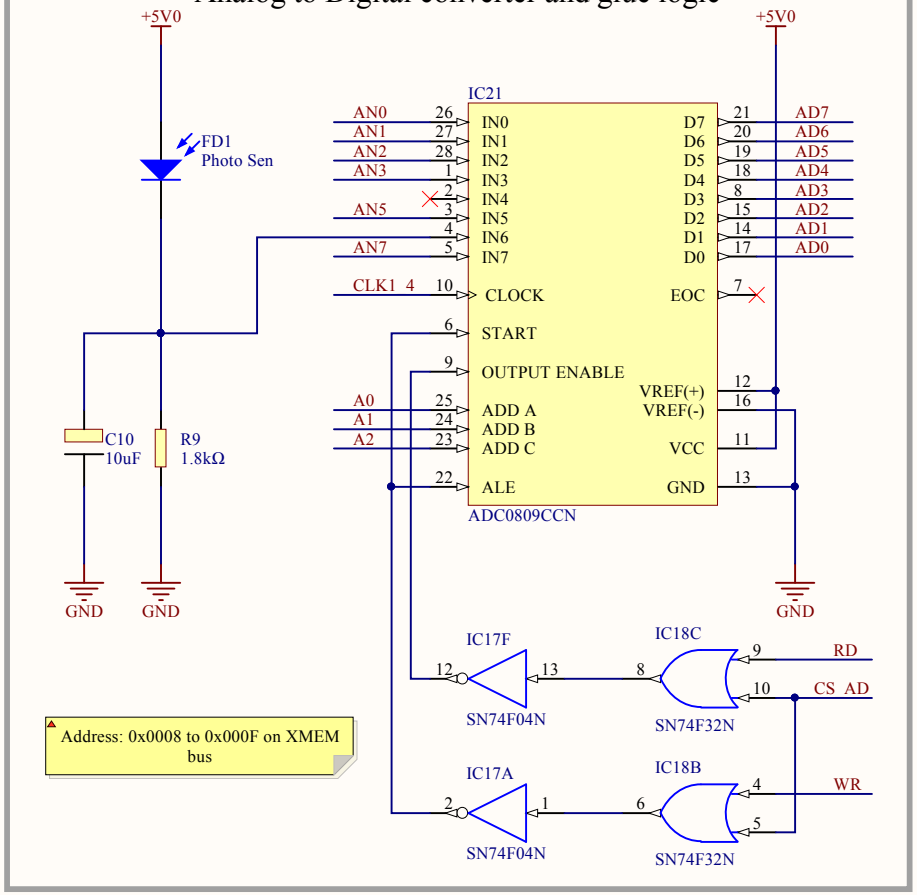
Sound (beep) driver



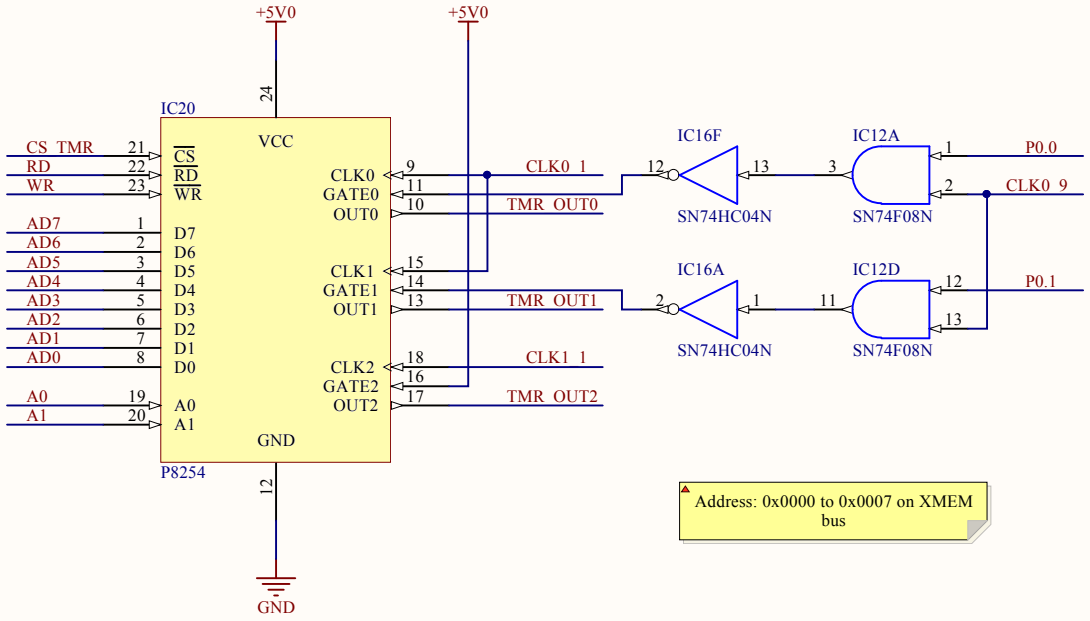
Miscellaneous PullUps



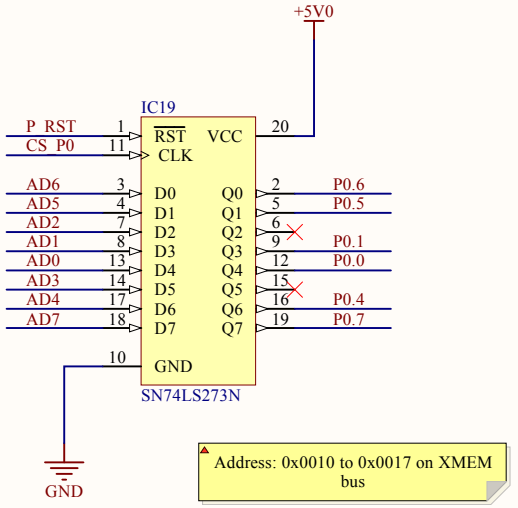
Analog to Digital converter and glue logic



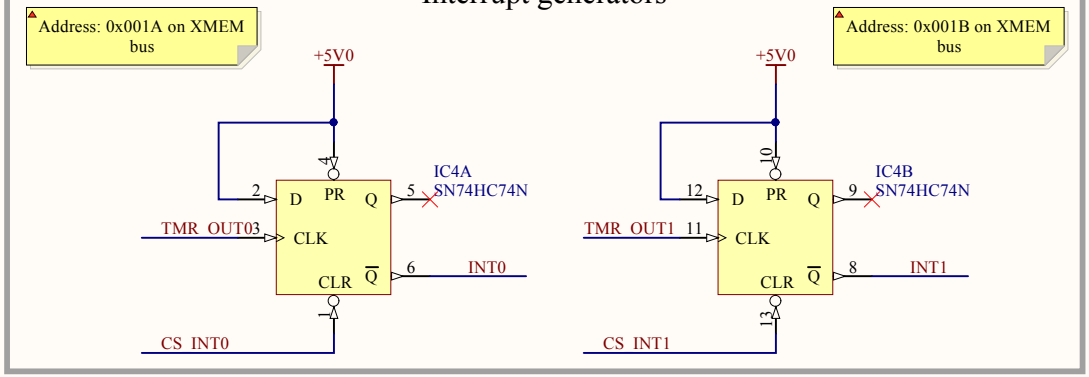
Motor/sound timer and glue logic

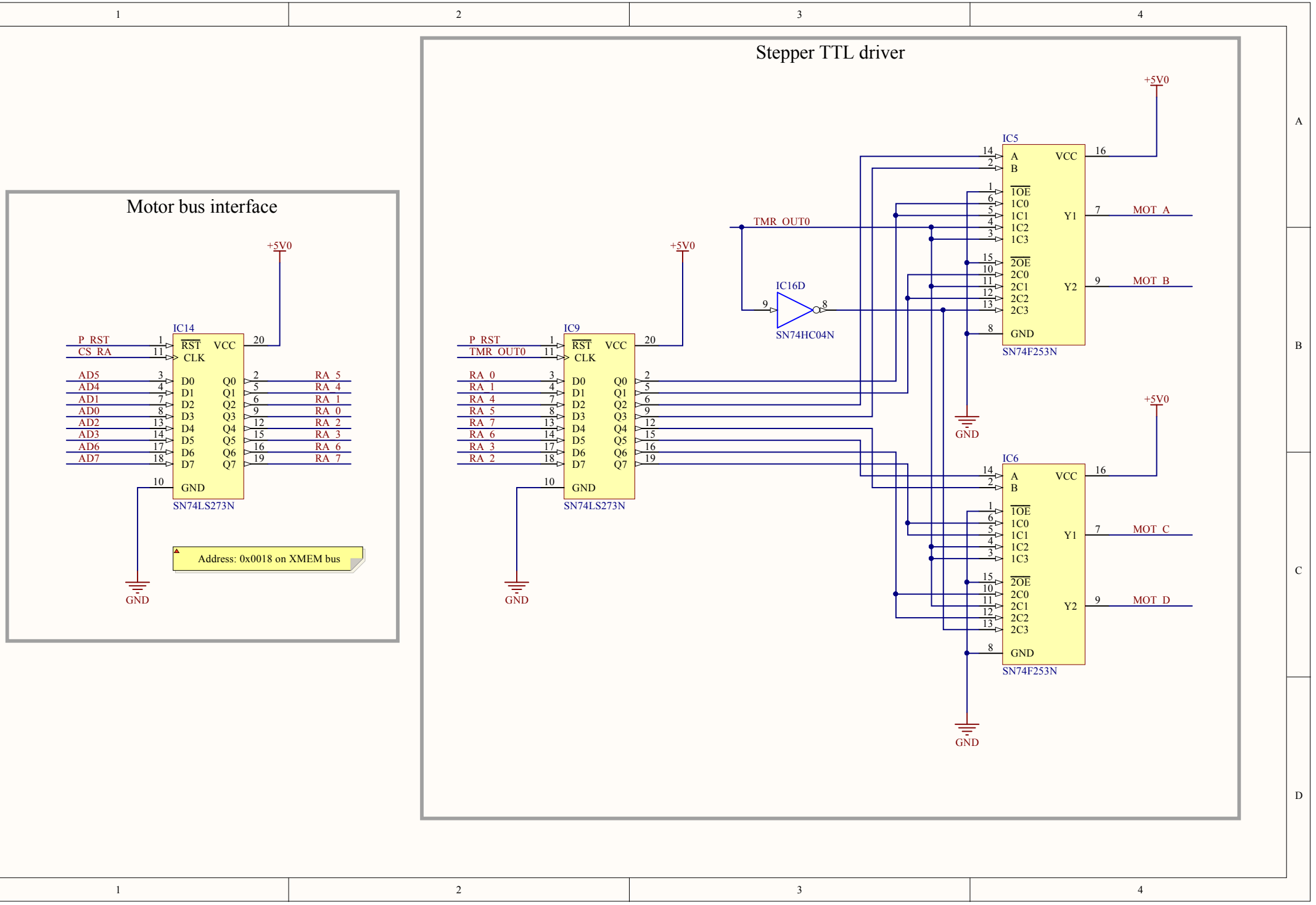


Auxiliary output port



Interrupt generators




Motor bus interface
+5V0
IC14
P_RST
CS_RA
AD5
AD4
AD1
AD0
AD2
AD3
AD6
AD7
RST
CLK
D0
D1
D2
D3
D4
D5
D6
D7
VCC
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
GND
SN74LS273N
RA_5
RA_4
RA_1
RA_0
RA_2
RA_3
RA_6
RA_7
Address: 0x0018 on XMEM bus
GND
Stepper TTL driver
+5V0
IC9
P_RST
TMR_OUT0
RA_0
RA_1
RA_4
RA_5
RA_7
RA_6
RA_3
RA_2
SN74LS273N
GND
TMR_OUT0
IC16D
SN74HC04N
IC5
IC6
A
B
1OE
1C0
1C1
1C2
1C3
2OE
2C0
2C1
2C2
2C3
Y1
Y2
MOT_A
MOT_B
MOT_C
MOT_D
SN74F253N
GND
+5V0
GND