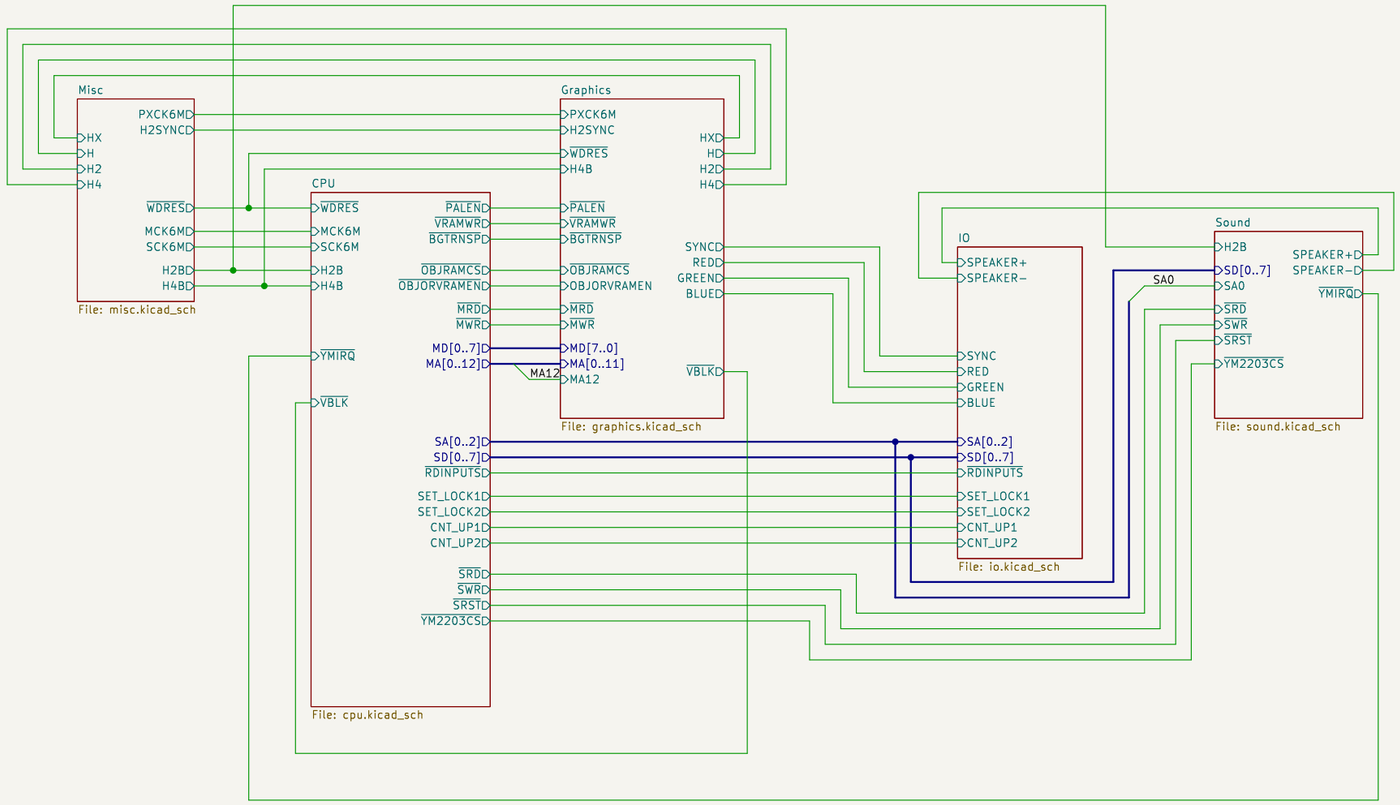


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Sheet: /
File: insectx.kicad_sch

***Title: Insector X – P0–056A***

| Size: A3 | Date: 2022–12–06 | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.5 | | Id: 1/6 |

U26-B06-12

~SWAIT = I9 & ~I11 & (~SSHRAMEN + SSHRAMRQ)
MWAIT = OBJORVRAMEN & SSHRAMEN + I6 & SSHRAMEN
SSHRAMEN = SSHRAMRQ + ~MSHRAMRQ & SSHRAMEN
MSHRAMEN = MSHRAMRQ + ~SSHRAMRQ & MSHRAMEN
SHRAMCS = MSHRAMRQ & SSHRAMRQ
SHRAMWR = MWR & SSHRAMEN + MSHRAMRQ & SSHRAMRQ + SWR & MSHRAMEN
SSHRAMENB = SSHRAMEN

Inputs i7 and i8 have been set to logical 1 in the equations.

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U36-B06-101

~PALEN = MA9 & MA10 & MA11 & MA12 & MA13 & ~MMREQ & MRFSH
~VRAMWR = MA9 & MA10 & MA11 & MA12 & ~MA13 & ~MA14 & ~MMREQ & MRFSH
~BGTRNSP = MA9 & MA10 & MA11 & MA12 & ~MA13 & MA14 & ~MA15 & ~MMREQ & MRFSH & MWR
~BNKSW = MA9 & MA10 & MA11 & MA12 & ~MA13 & MA14 & MA15 & ~MMREQ & MRFSH & ~MWR
~OBJCODELO = MA9 & MA10 & ~MA11 & ~MA12 & ~MMREQ & MRFSH
~OBJCODEHI = MA9 & MA10 & ~MA11 & MA12 & ~MMREQ & MRFSH
~MSHRAMRQ = MA9 & MA10 & MA11 & ~MA12 & ~MMREQ & MRFSH
~OBJORVRAMEN = MA9 & MA10 & MA11 & MA12 & ~MA13 & (~MA15 & ~MMREQ & MRFSH + ~MA14 & ~MMREQ & MRFSH) +
MA9 & MA10 & ~MA11 & ~MMREQ & MRFSH

---

U35-B53-12

MRA16 = MA15 & MBSWD2
MRA15 = MA15 & MBSWD1
~MRA14 = MA15 & ~MBSWD0 + ~MA15 & ~MA14
~MROMCS = ~MA15 & MA14 & ~MMREQ & MRFSH & ~MBSWD2 & MBSWD1 +
~MA14 & ~MMREQ & MRFSH & ~MBSWD2 & MBSWD1 +
~MA15 & MA14 & ~MMREQ & MRFSH & MBSWD2 +
~MA15 & ~MMREQ & MRFSH & ~MBSWD1 +
~MA14 & ~MMREQ & MRFSH & MBSWD2
~MRAMCS = MA15 & ~MA14 & ~MMREQ & MRFSH & ~MBSWD2 & ~MBSWD1
o17 = OBJCODELO & ~H4B
o18 = OBJCODEHI & ~H4B
OBJRAMCS = OBJCODELO & OBJCODEHI & ~H4B

---

U25-B06-13

~SROMCS = ~SA14 & ~SA13 & ~SMREQ & SRFSH + ~SA15 & SA14 & ~SMREQ & SRFSH + ~SA15 & ~SA14 & ~SMREQ & SRFSH
~SSHRAMRQ = SA15 & SA14 & SA13 & ~SA12 & ~SMREQ & SRFSH + SA15 & SA14 & ~SA13 & SA12 & ~SMREQ & SRFSH
~SBNKSW = SA15 & ~SA14 & SA13 & ~SA12 & ~SWR & ~SMREQ & SRFSH
~YM2203CS = SA15 & ~SA14 & SA13 & SA12 & ~SMREQ & SRFSH
~RDINPUTS = SA15 & SA14 & ~SA13 & ~SA12 & ~SMREQ & SRFSH
o17 = SA15 & SA14 & SA13 & SA12 & ~SMREQ & SRFSH
SRA13 = SA15 & SBANK0 + ~SA15 & SA13
SRA14 = SA15 & SBANK1 + ~SA15 & SA14


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Sheet: /CPU/
File: cpu.kicad_sch

**Title: Insector X – P0–056A**

Size: A3 | Date: 2022-12-06 | Rev:
KiCad E.D.A. 8.0.5 | Id: 2/6

U23 and U33 use a modified version of LS245 in order to avoid errors during ERC. This happens when GND is connected to a tri-state input.

Pixel clock PXCK6M: f = 6MHz

Horizontal sync and blanking signals have a
period of 64us and frequency 15.625kHz.
Pixels / horizontal line = 64us x 6MHz = 384 pixels.

Vertical sync and blanking signals have a
period of 16.896ms and a frequency of 59.1856Hz.
Vertical lines = 16.896ms x 15.625kHz = 264 lines.

The composite SYNC signal is a wired and of $\overline{HSYNC}$ and $\overline{VSYNC}$

| | $\overline{HBLK}$ | $\overline{HBLK2}$ | $\overline{HSYNC}$ |
|---|---|---|---|
| Active pixels | 320 | 256 | 352 |
| Blank pixels | 64 | 128 | 32 |

| | $\overline{VBLK}$ | $\overline{VSYNC}$ |
|---|---|---|
| Active lines | 224 | 256 |
| Blank lines | 40 | 8 |

| | $\overline{HBLK2}$–$\overline{HBLK}$ | $\overline{HBLK}$–$\overline{HSYNC}$ | $\overline{VBLK}$–$\overline{VSYNC}$ |
|---|---|---|---|
| Front porch | 32 | 4 | 16 |
| Back porch | 32 | 28 | 24 |

When $\overline{VSYNC}$ goes low there is a delay of 60 pixels (10us x 6MHz)
from $\overline{HSYNC}$ going high. It is the same delay when $\overline{VSYNC}$ goes high.

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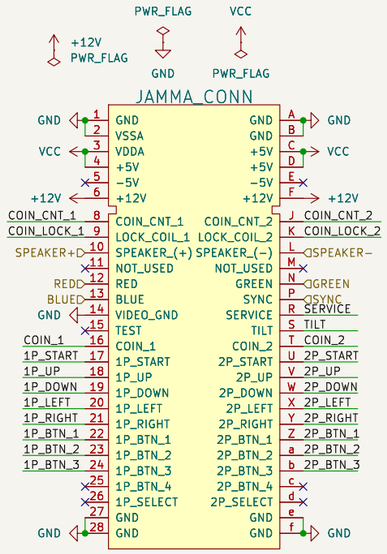
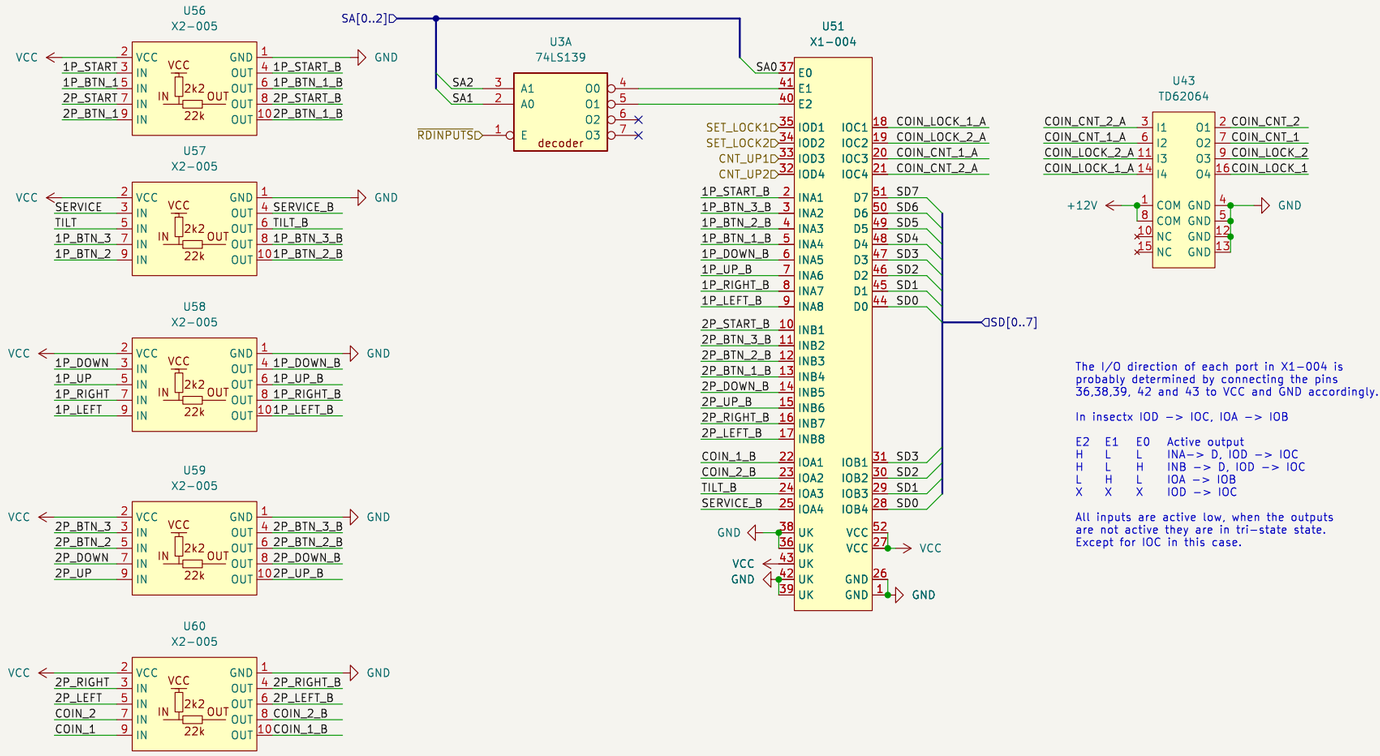
Sheet: /Graphics/
File: graphics.kicad_sch

**Title: Insector X – P0–056A**

| Size: A3 | Date: 2022–12–06 | Rev: |
|---|---|---|
| KiCad E.D.A. 8.0.5 | | Id: 3/6 |

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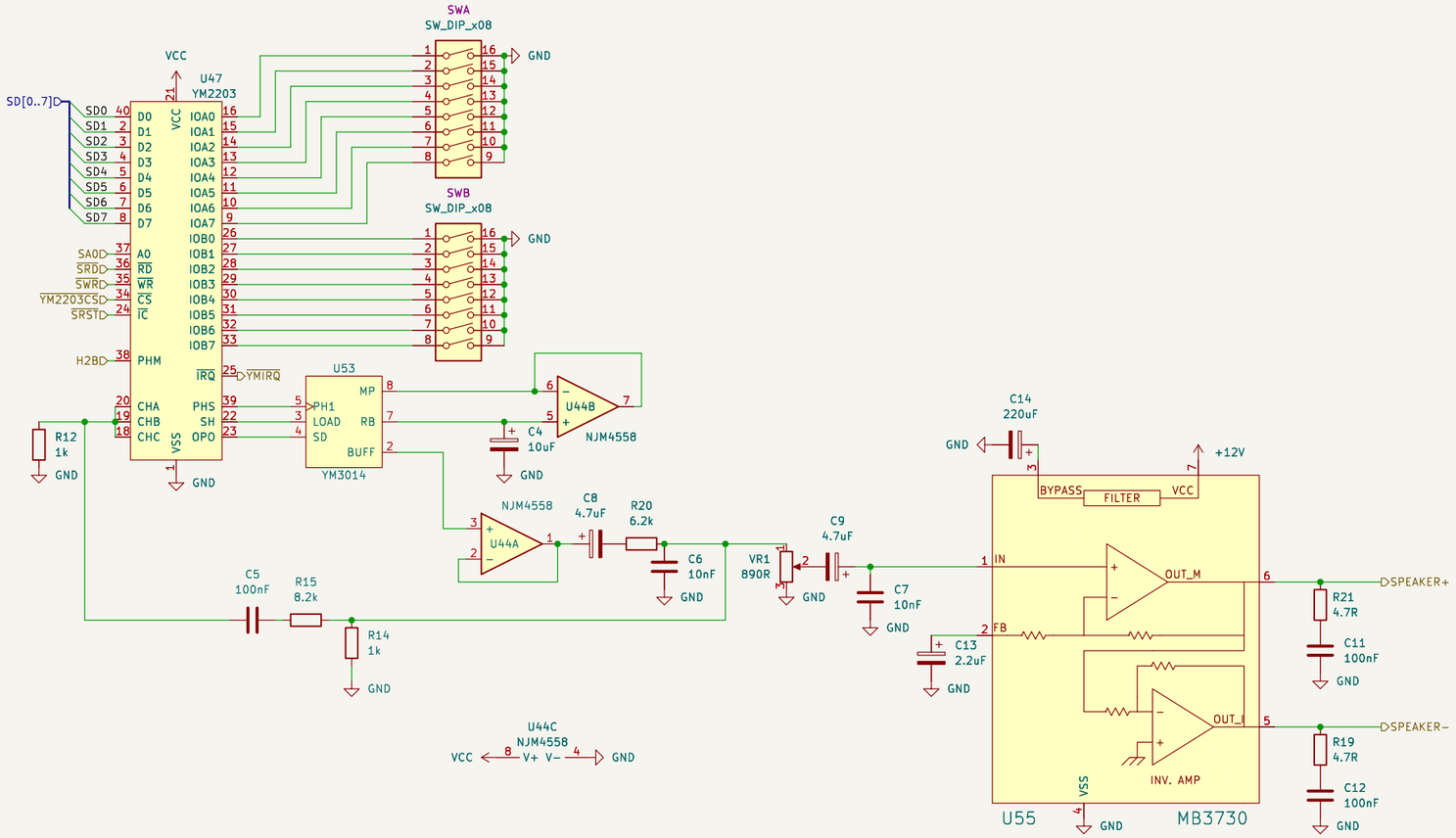
Sheet: /IO/
File: io.kicad_sch

**Title: Insector X – P0-056A**

| Size: A3 | Date: 2022-12-06 | Rev: |
|---|---|---|
| KiCad E.D.A. 8.0.5 | | Id: 4/6 |




| | | |
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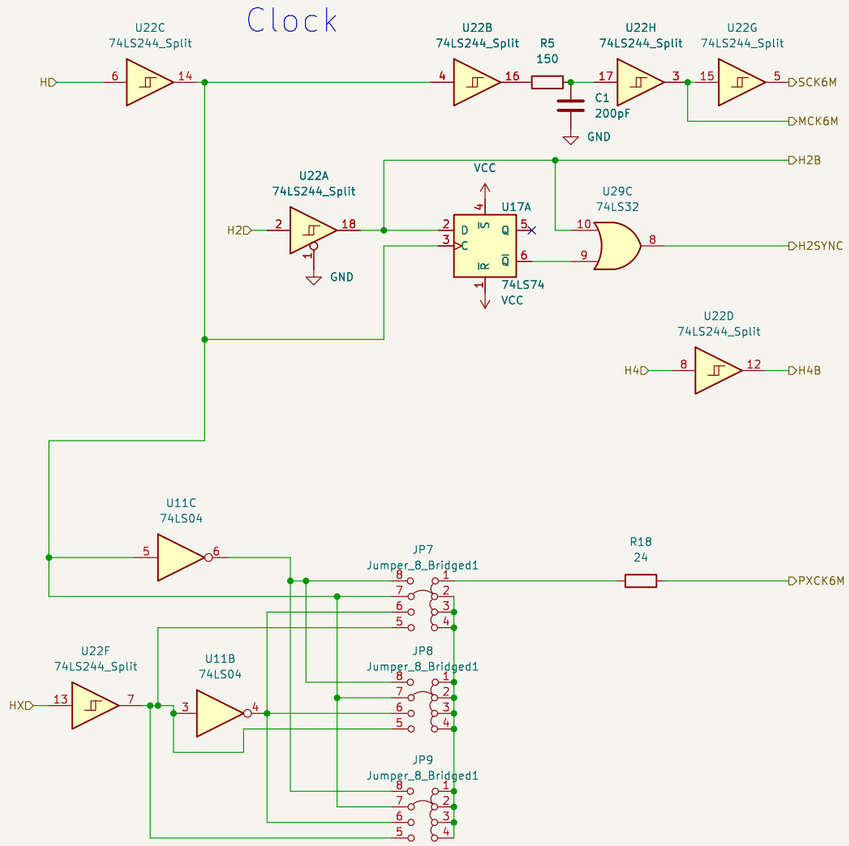
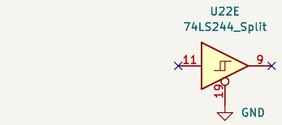
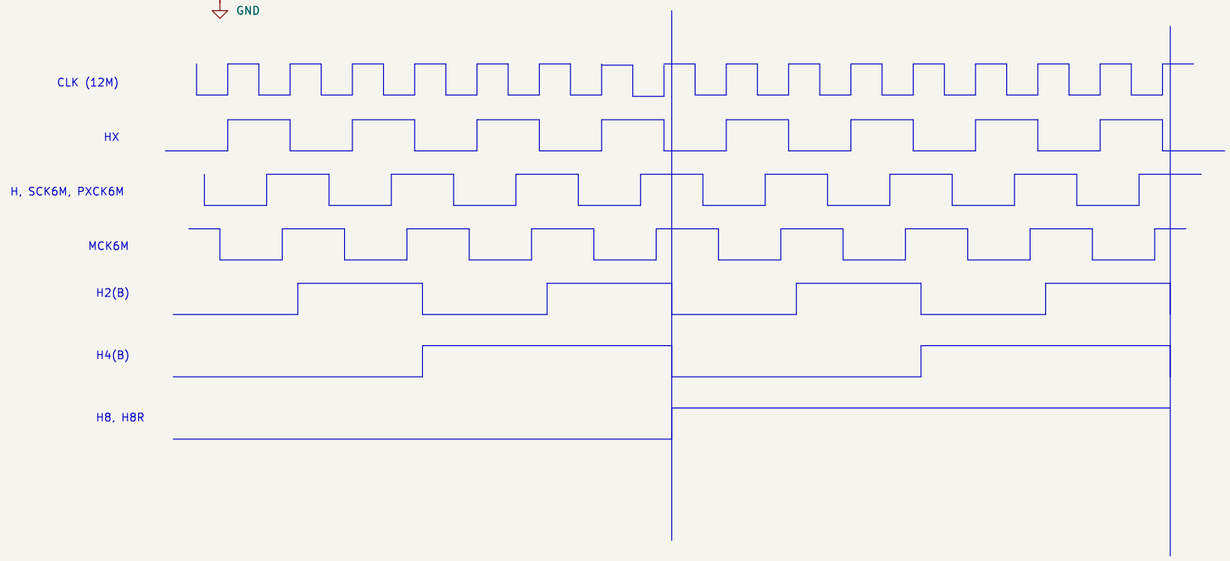
| Sheet: /Sound/ | | |
| File: sound.kicad_sch | | |
| **Title: Insector X – P0–056A** | | |
| Size: A3 | Date: 2022–12–06 | **Rev:** |
| KiCad E.D.A. 8.0.5 | | Id: 5/6 |

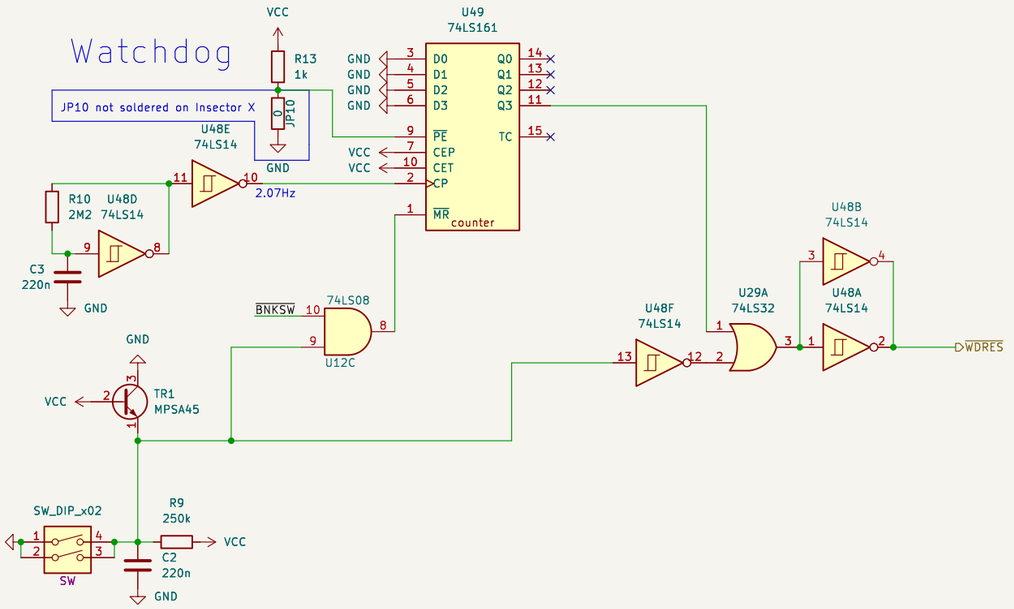
# Clock




# Watchdog

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Sheet: /Misc/
File: misc.kicad_sch

***Title: Insector X – P0–056A***

| Size: A3 | Date: 2022–12–06 | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.5 | | Id: 6/6 |