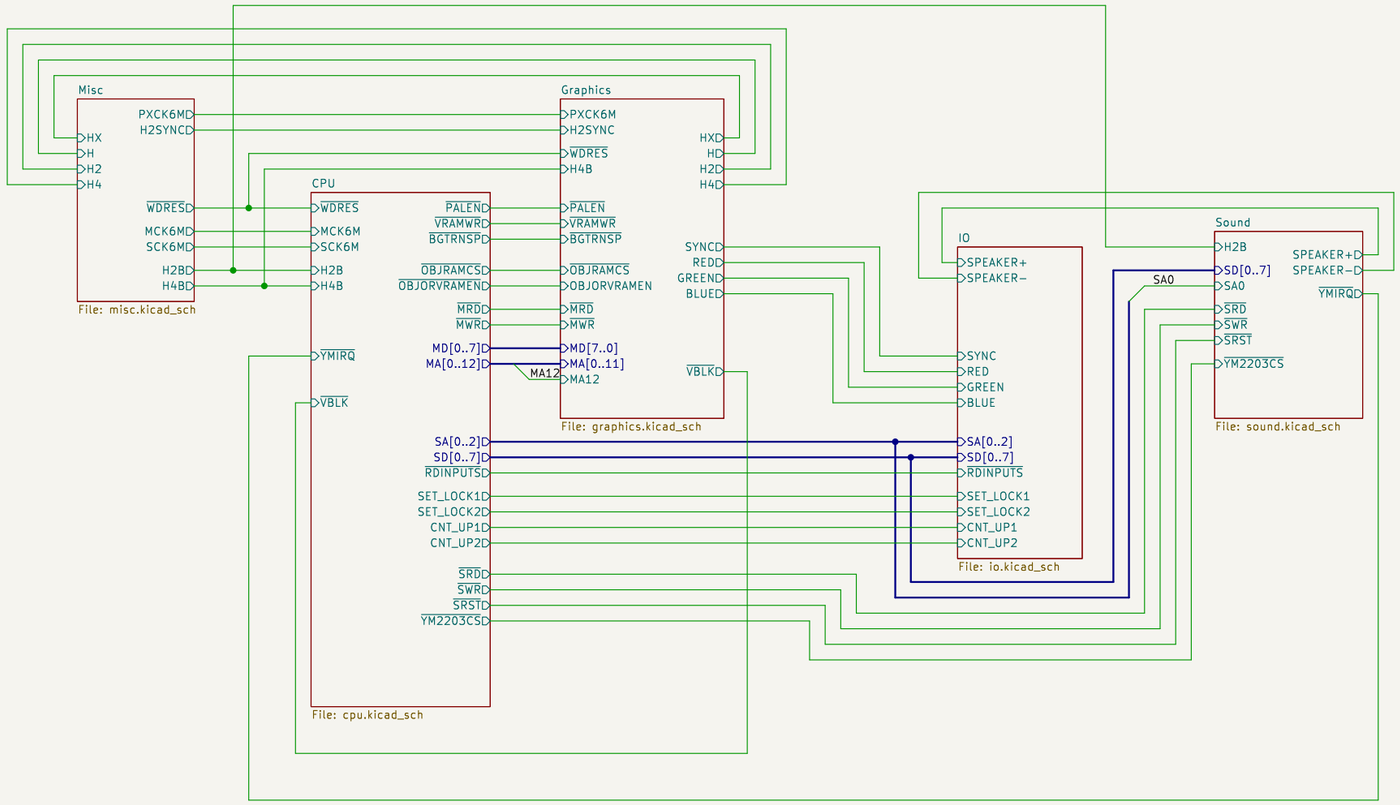

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Sheet: /
File: insectx.kicad_sch

Title: Insector X – P0–056A

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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.

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		
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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:
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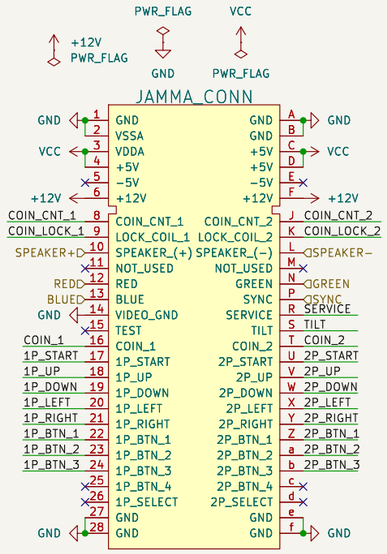

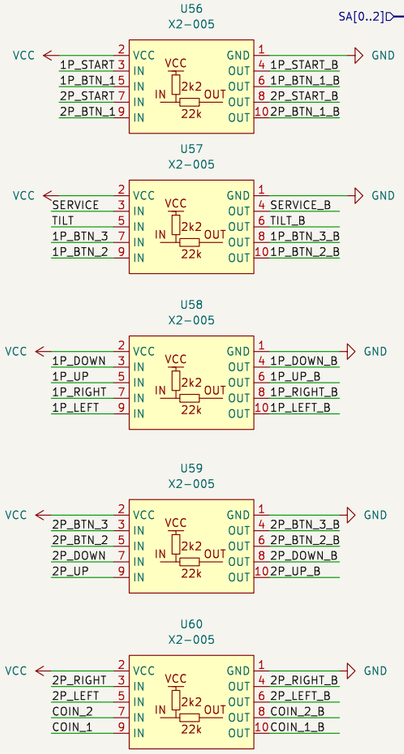

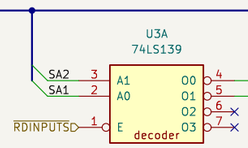

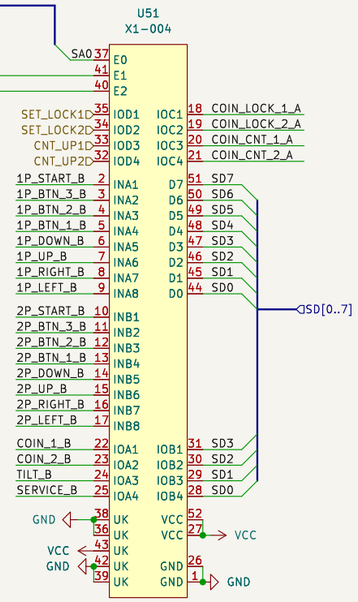

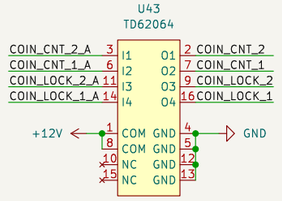

The I/O direction of each port in X1-004 is probably determined by connecting the pins 36,38,39, 42 and 43 to VCC and GND accordingly.

In insectx IOD -> IOC, IOA -> IOB

E2	E1	E0	Active output
H	L	L	INA-> D, IOD -> IOC
H	L	H	INB -> D, IOD -> IOC
L	H	L	IOA -> IOB
X	X	X	IOD -> IOC

All inputs are active low, when the outputs are not active they are in tri-state state. Except for IOC in this case.

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Sheet: /IO/
File: io.kicad_sch

Title: Insector X – P0-056A

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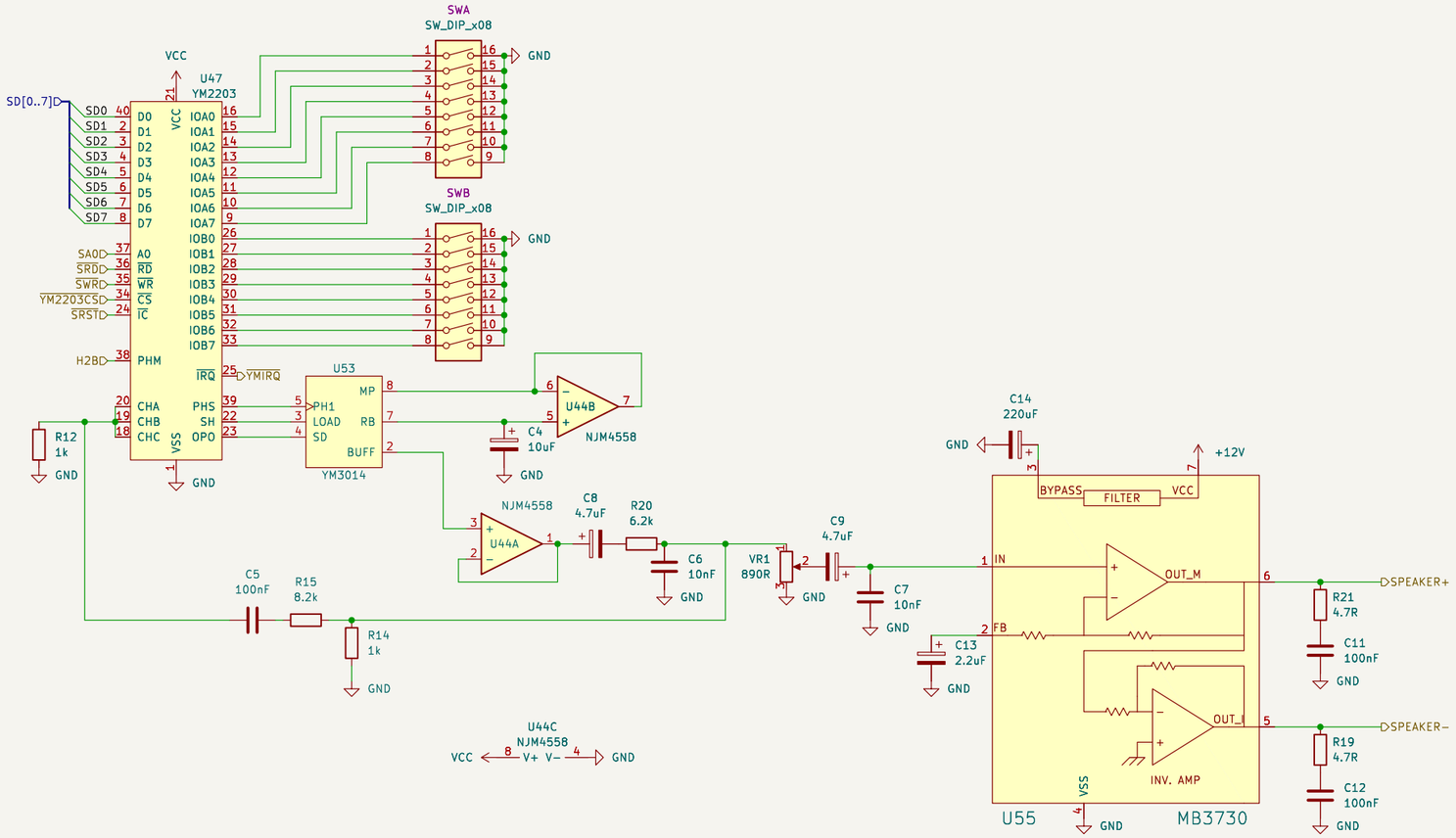

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Sheet: /Sound/

File: sound.kicad_sch

Title: Insector X – P0-056A

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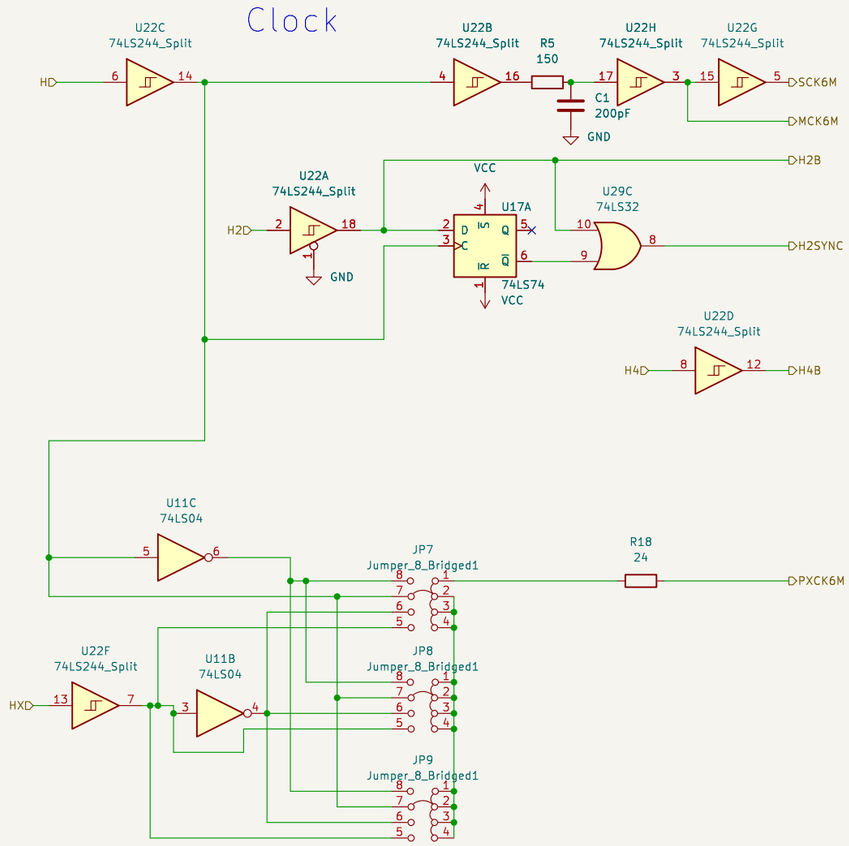
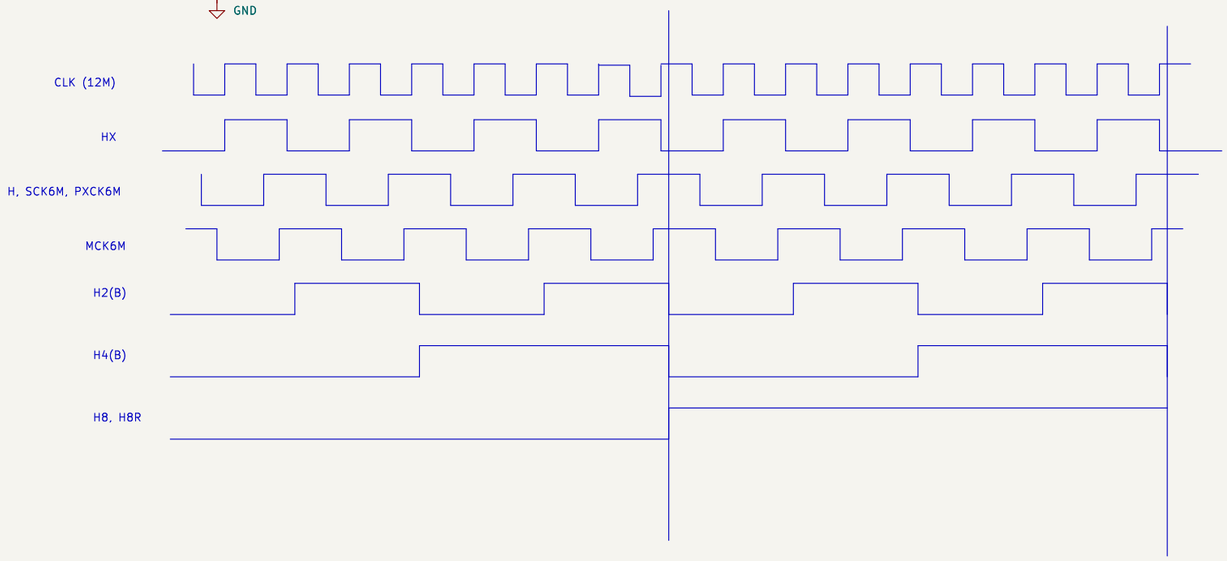
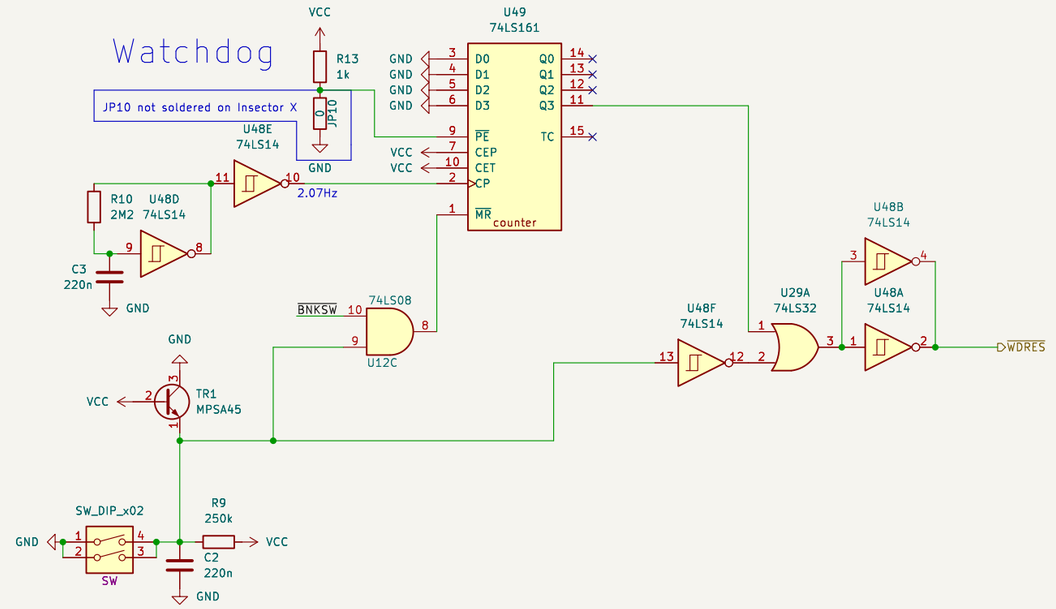
Clock





Watchdog



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Sheet: /Misc/
File: misc.kicad_sch

Title: Insector X – P0–056A

Size: A3	Date: 2022–12–06	**Rev:**
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