

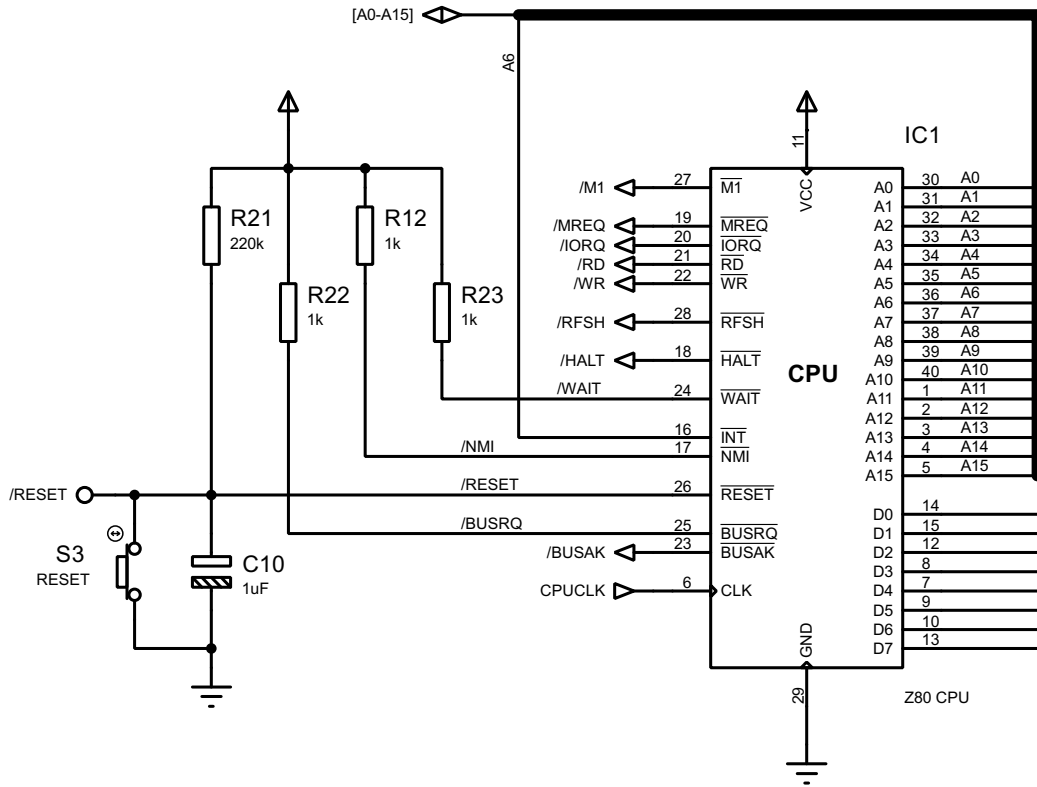
# ZX80/81 Project

by Augusto Baffa, Phd

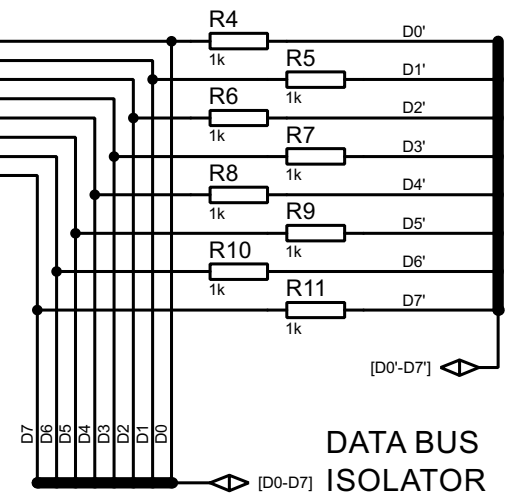
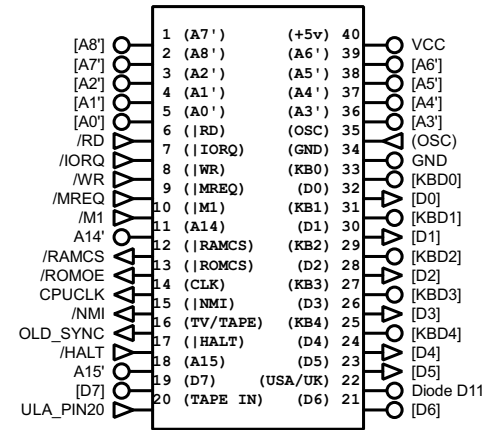
Assembled and Tested - Feb/2021

<http://www.augustobaffa.pro.br/>

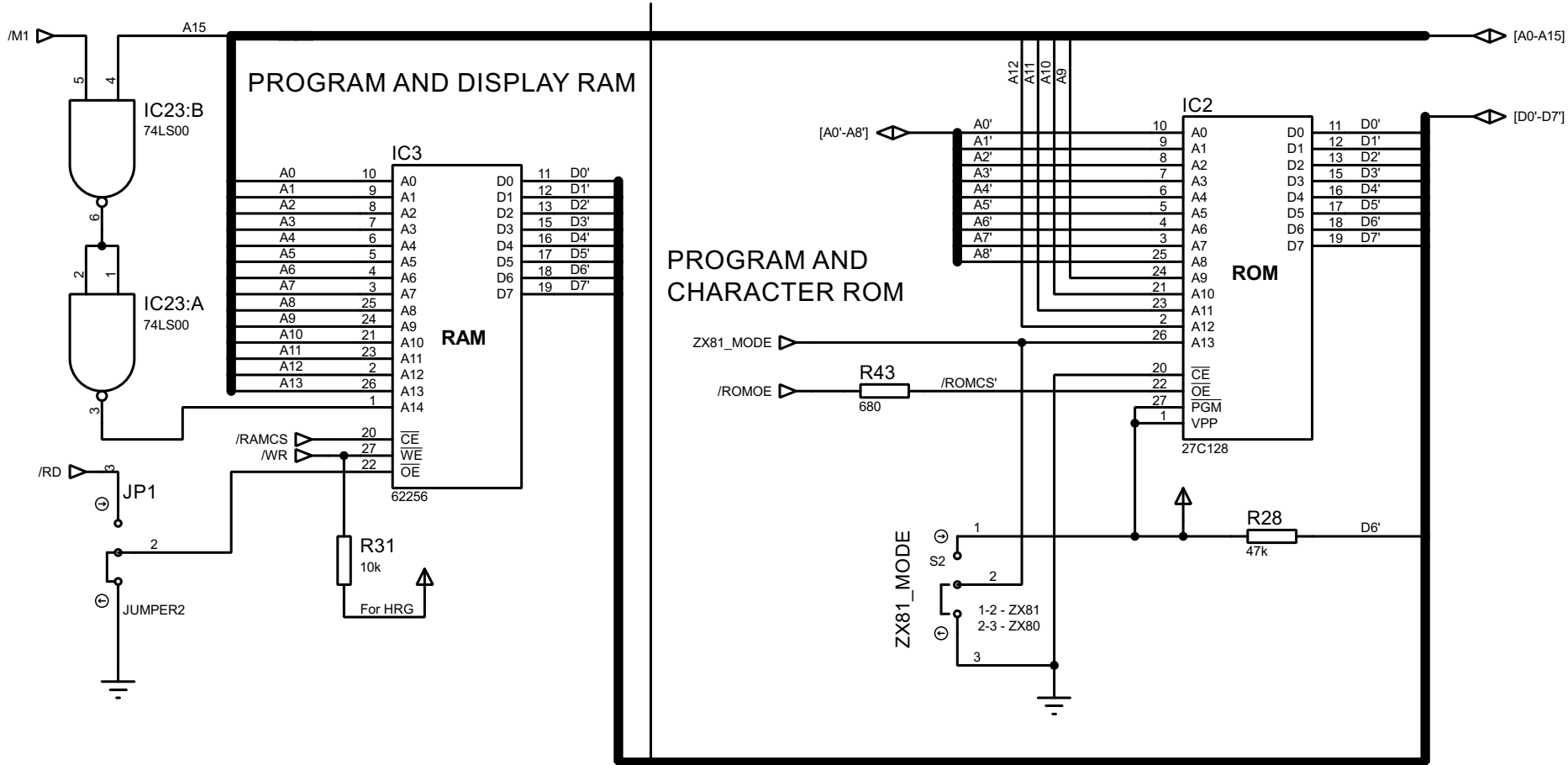
# CPU



# ULA



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 Based on original design by Grant Seale

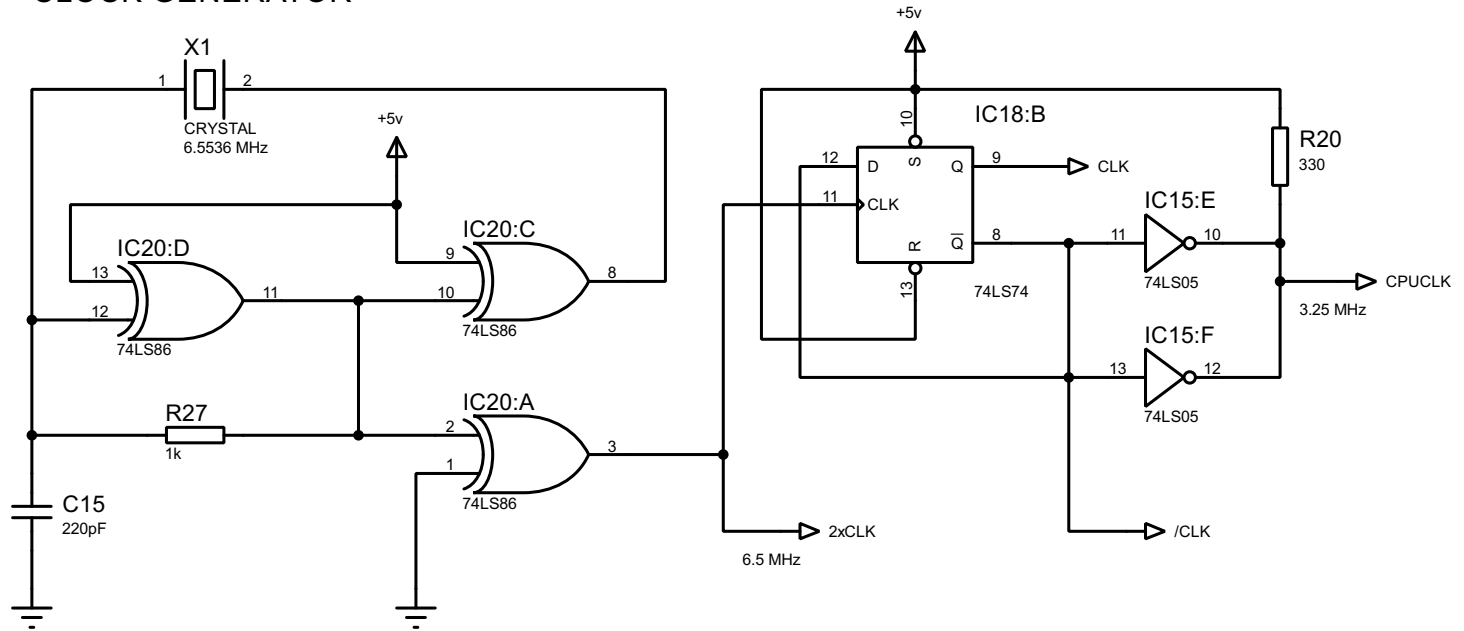


### ZX81 Project - Base

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Based on original design by Grant Seale

# CLOCK GENERATOR



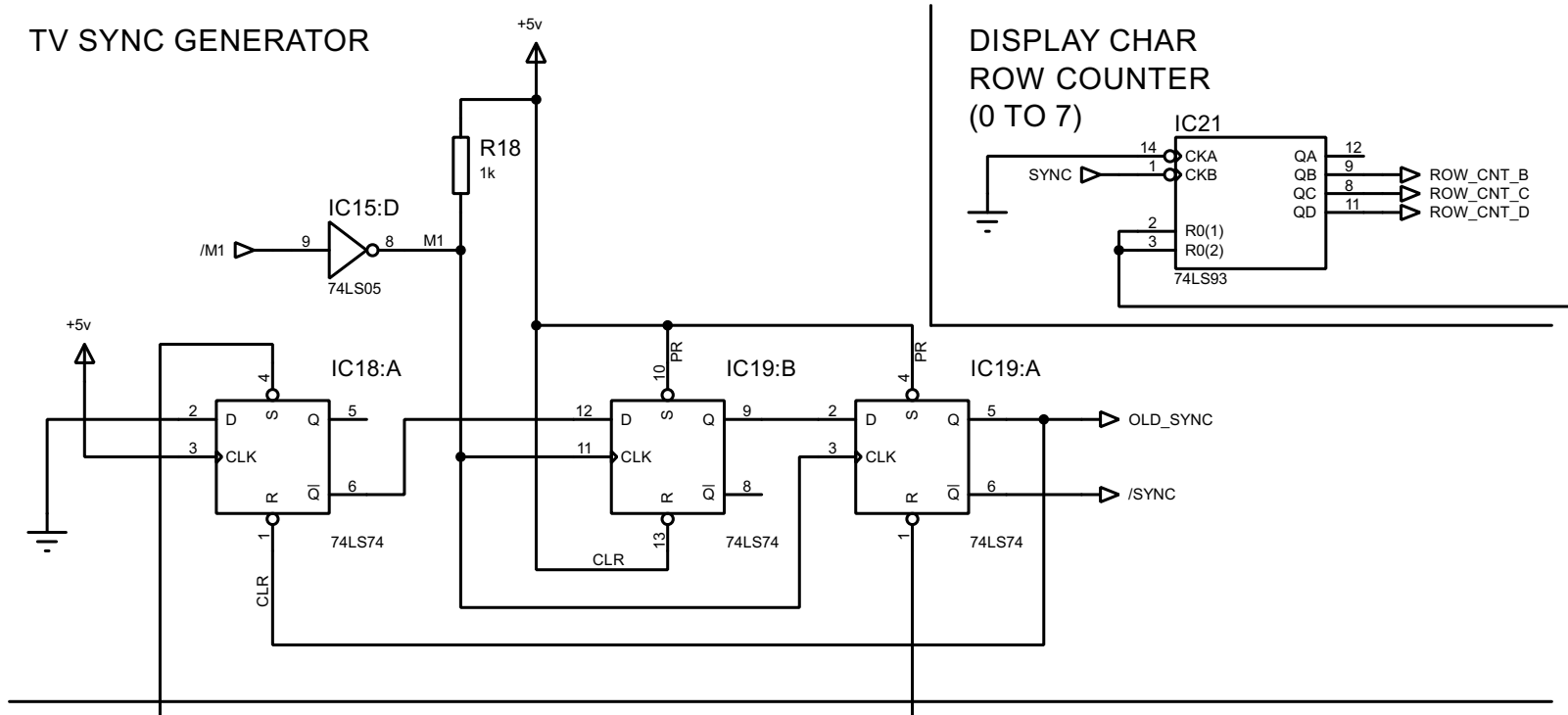
**ZX81 Project - Base**

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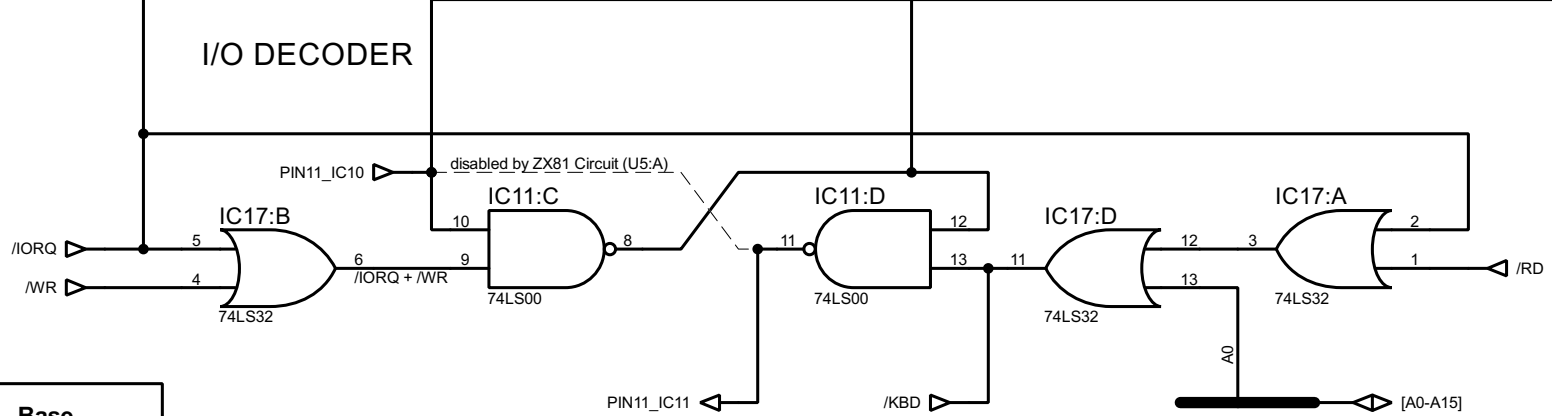
Based on original design by Grant Seale

# TV SYNC GENERATOR

# DISPLAY CHAR ROW COUNTER (0 TO 7)

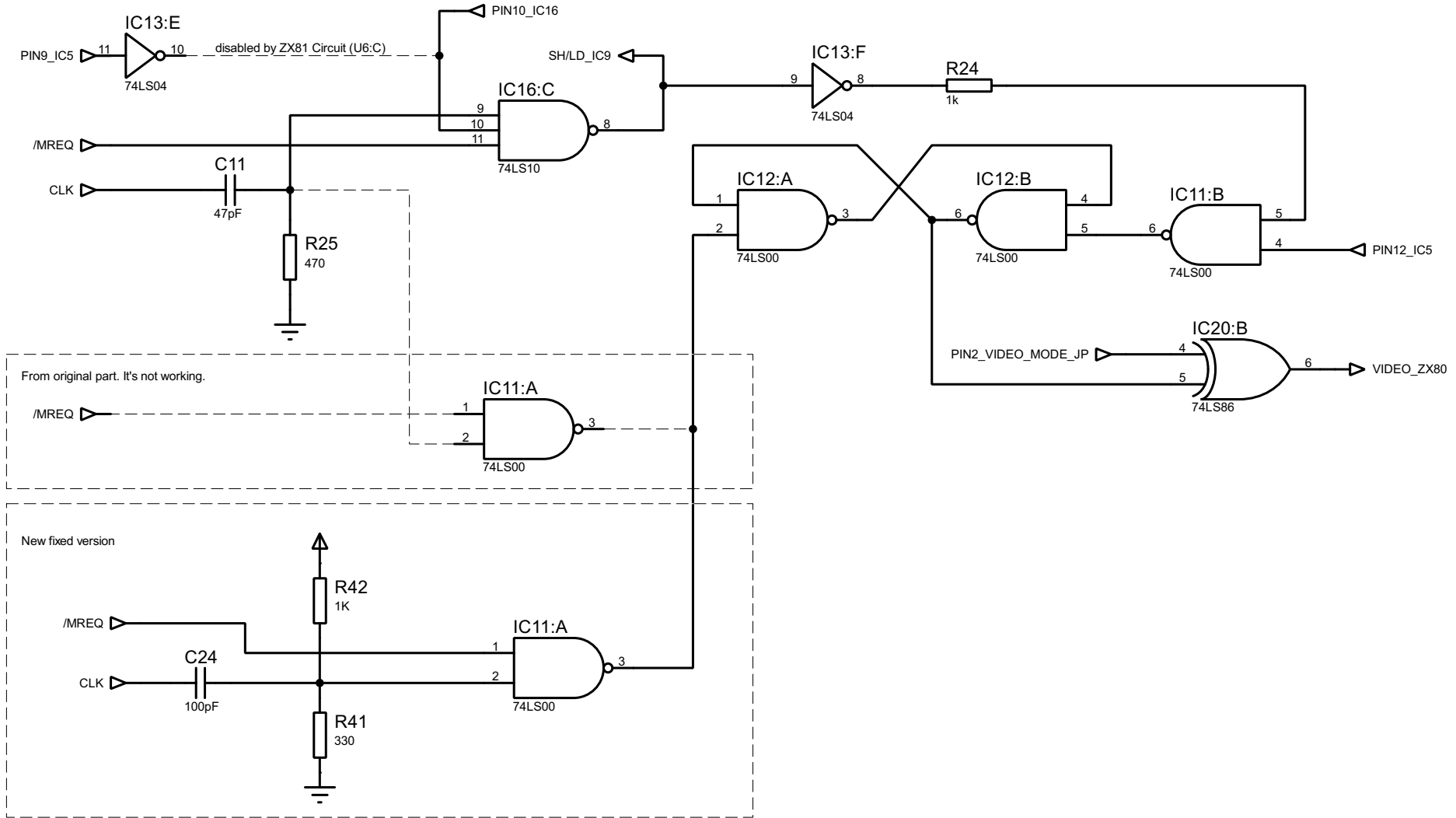


# I/O DECODER



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# NORMAL/INVERT CHARACTER LATCH

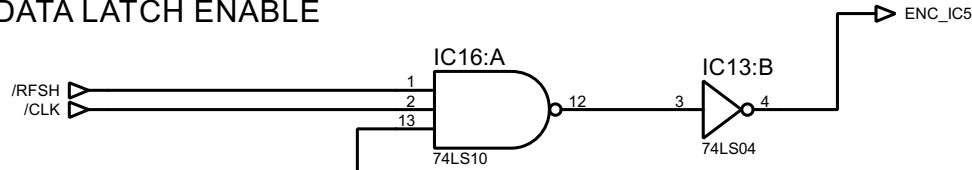


**ZX81 Project - Base**

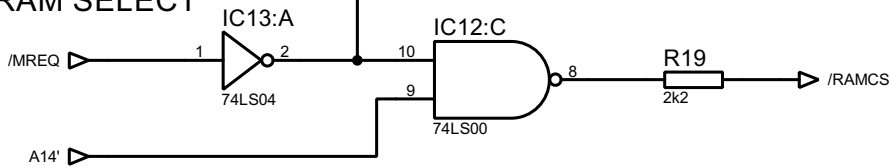
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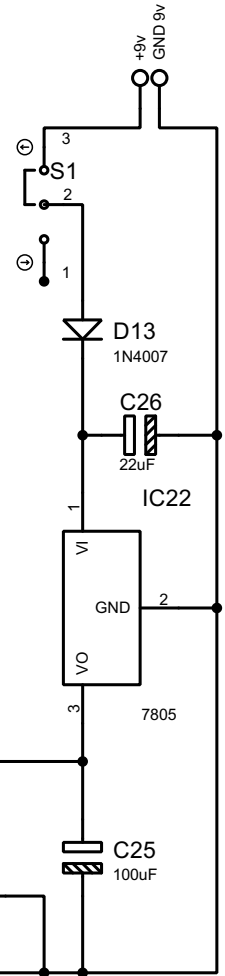
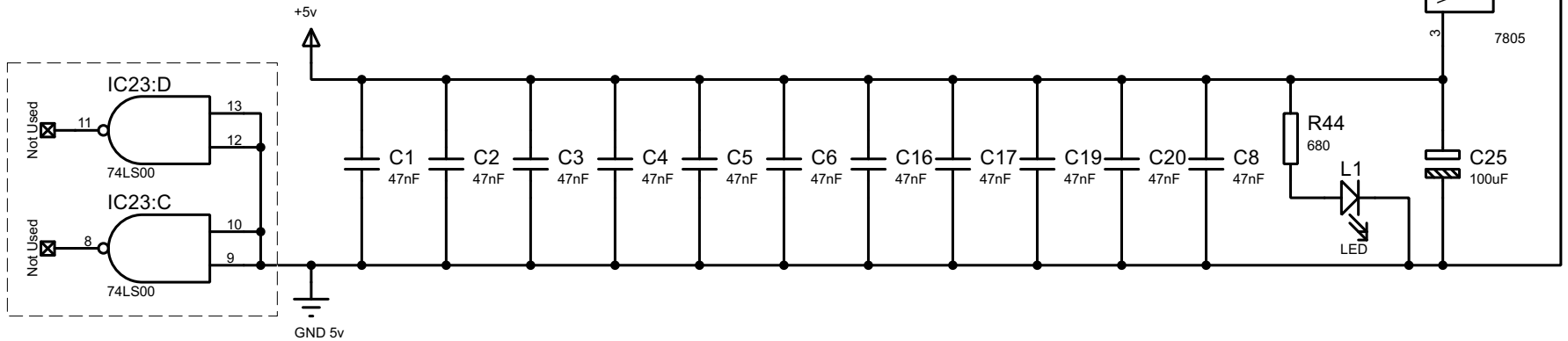
### DATA LATCH ENABLE



### RAM SELECT



### POWER REGULATOR 5v

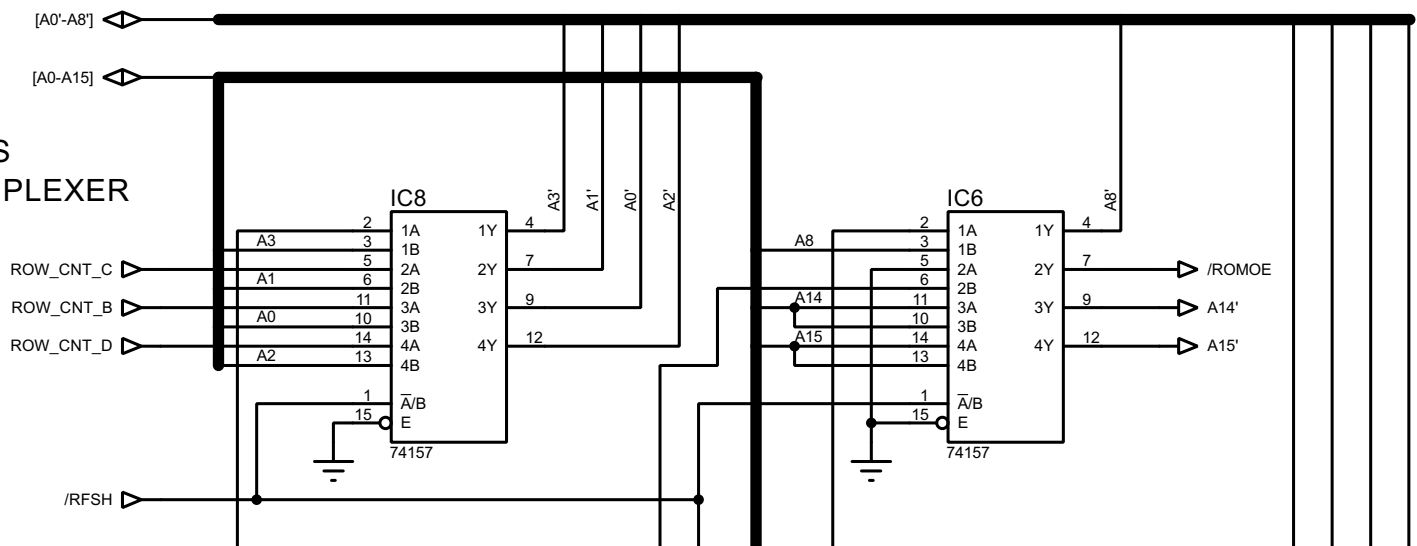


**ZX81 Project - Base**

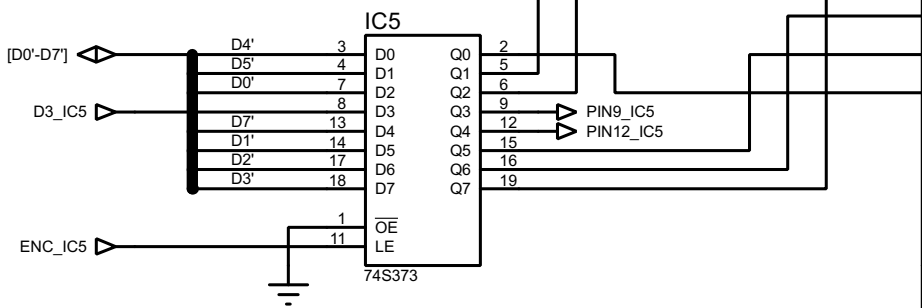
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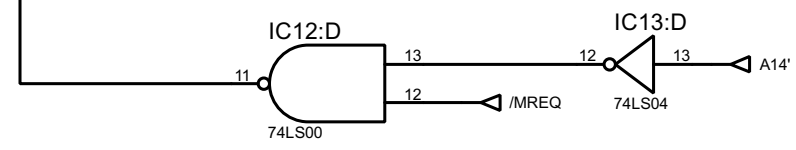
# CPU/DISPLAY ACCESS ROM ADDRESS MULTIPLEXER



# RAM DATA LATCH



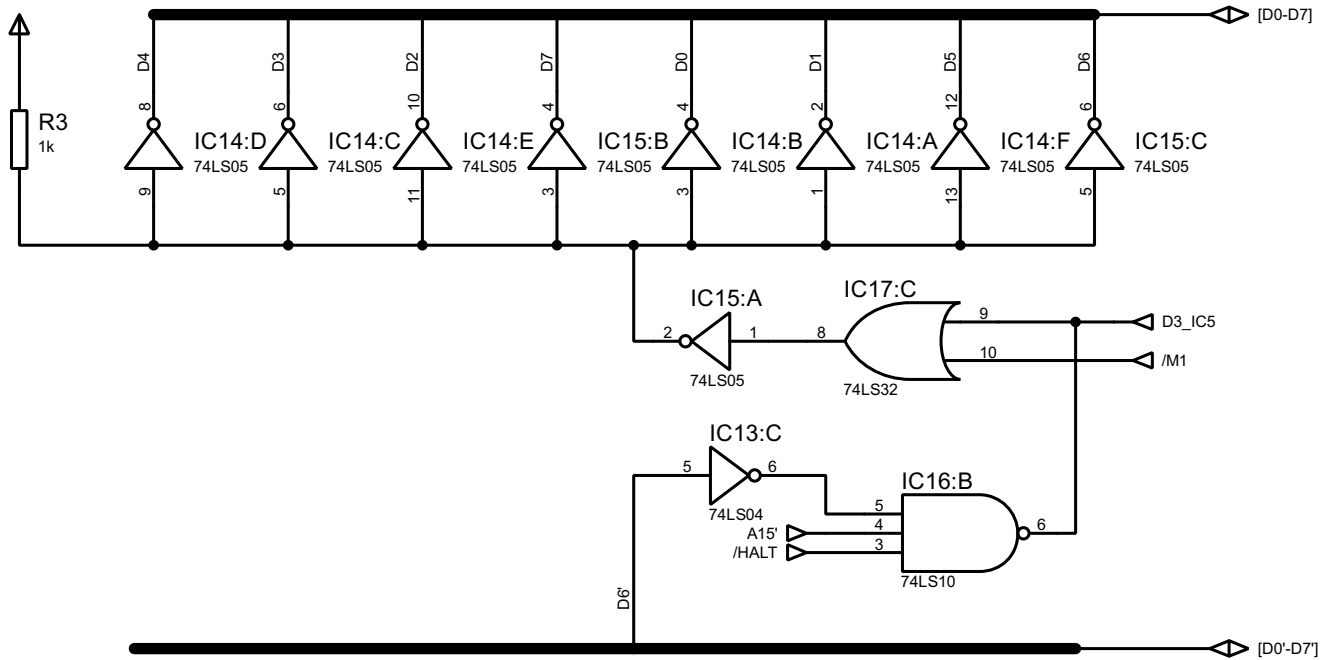
# ROM SELECT



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# "NOP" OPCODE GENERATOR

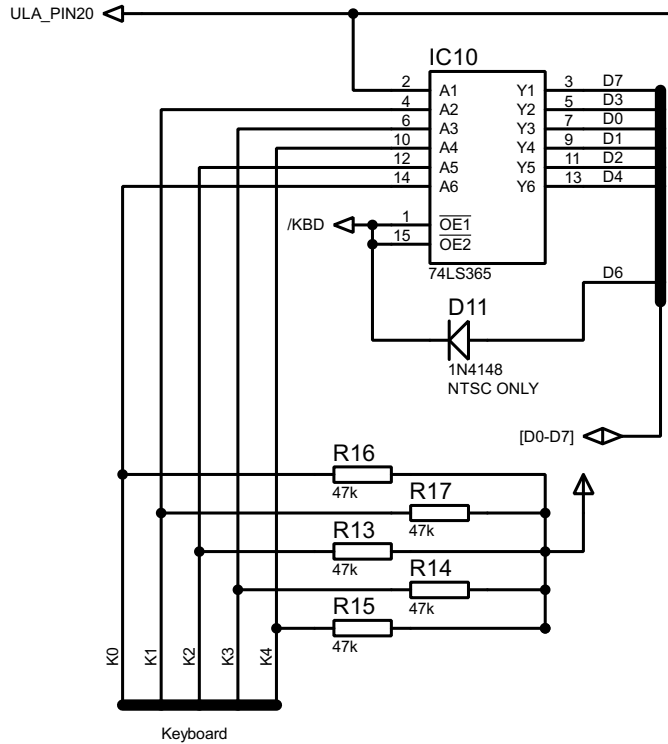


**ZX81 Project - Base**

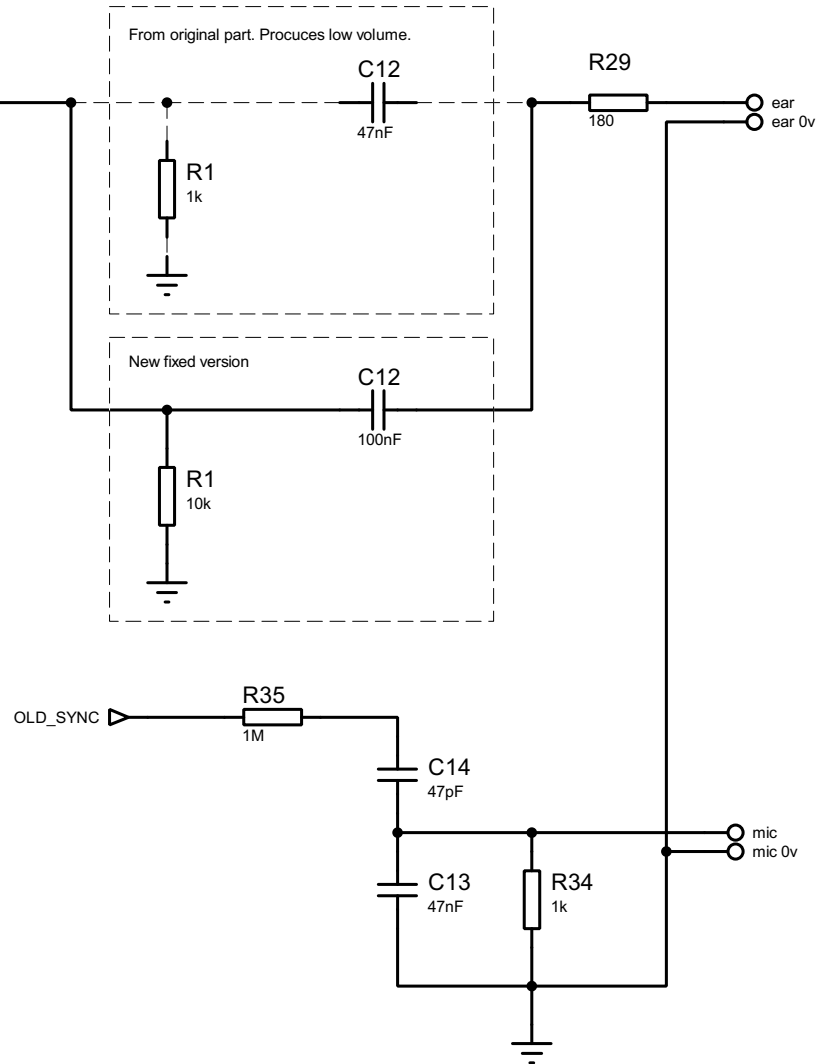
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Based on original design by Grant Seale

## CASSETTE I/O AND KEYBOARD READ



## CASSETTE INTERFACE

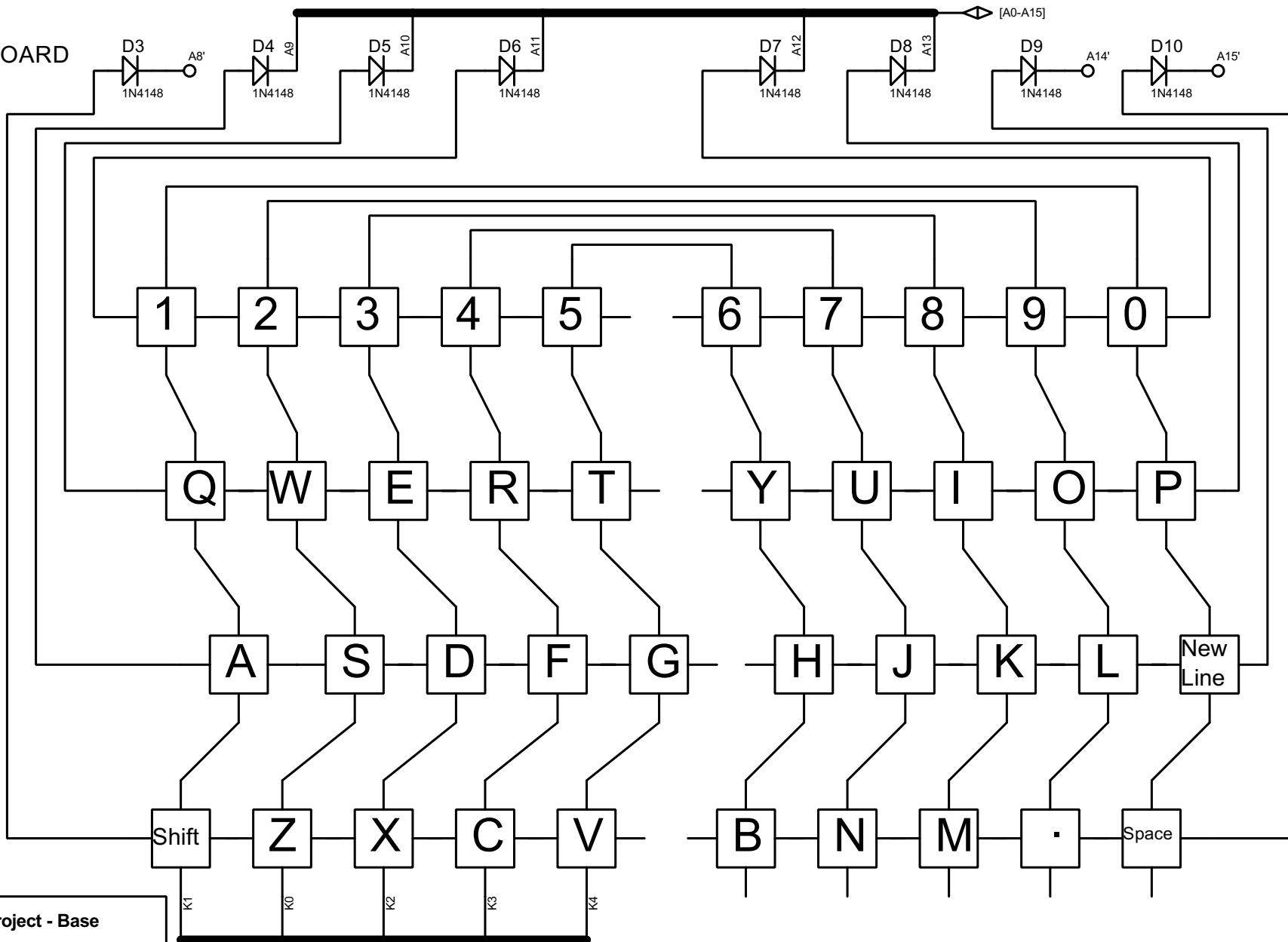


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KEYBOARD



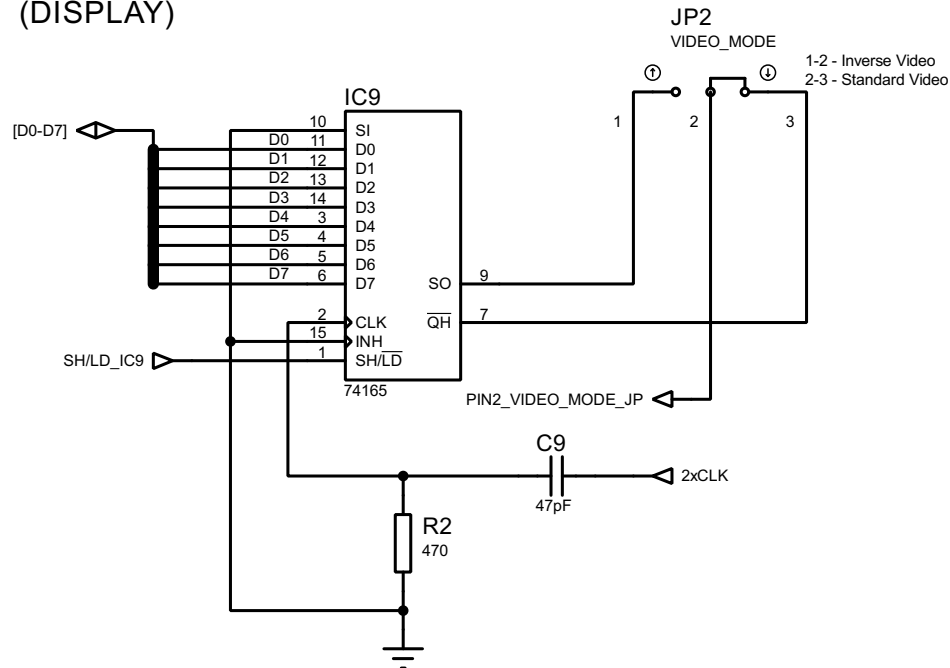
**ZX81 Project - Base**

Augusto Baffa © 2021

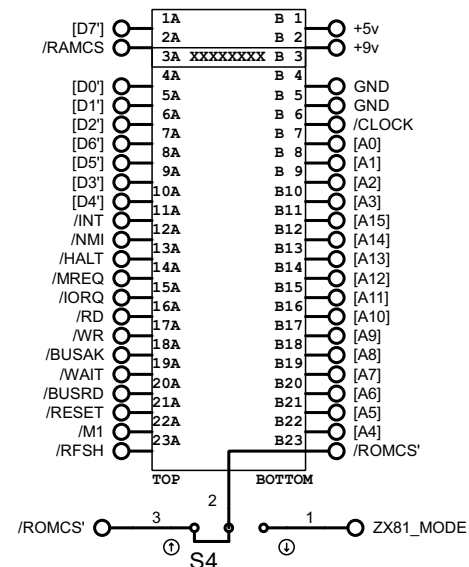
Based on original design by Grant Seale

Keyboard

# PARALLEL TO SERIAL BIT SHIFT (DISPLAY)

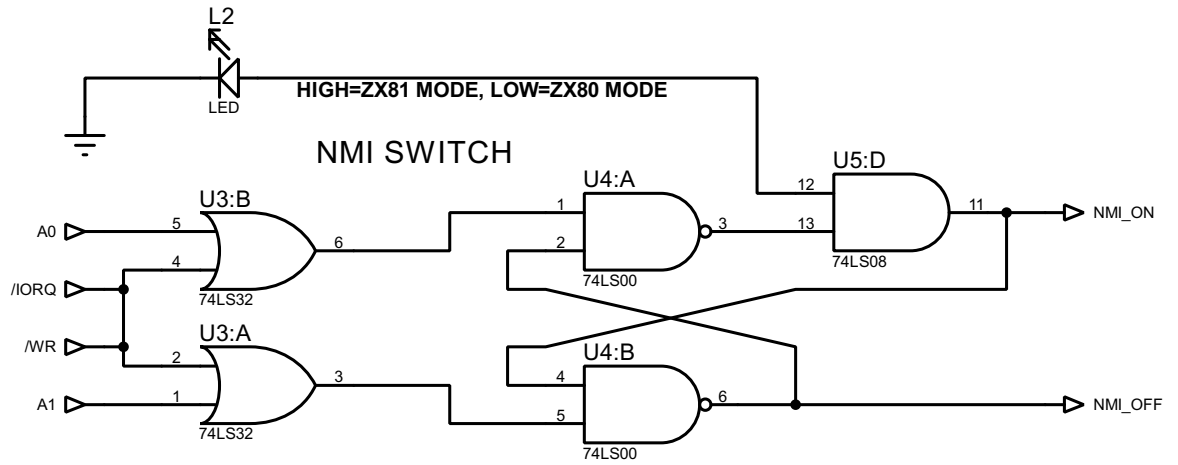
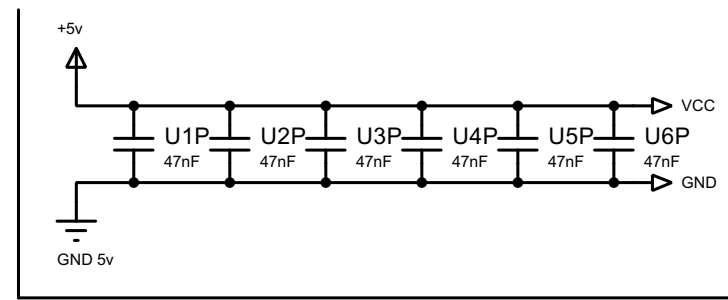
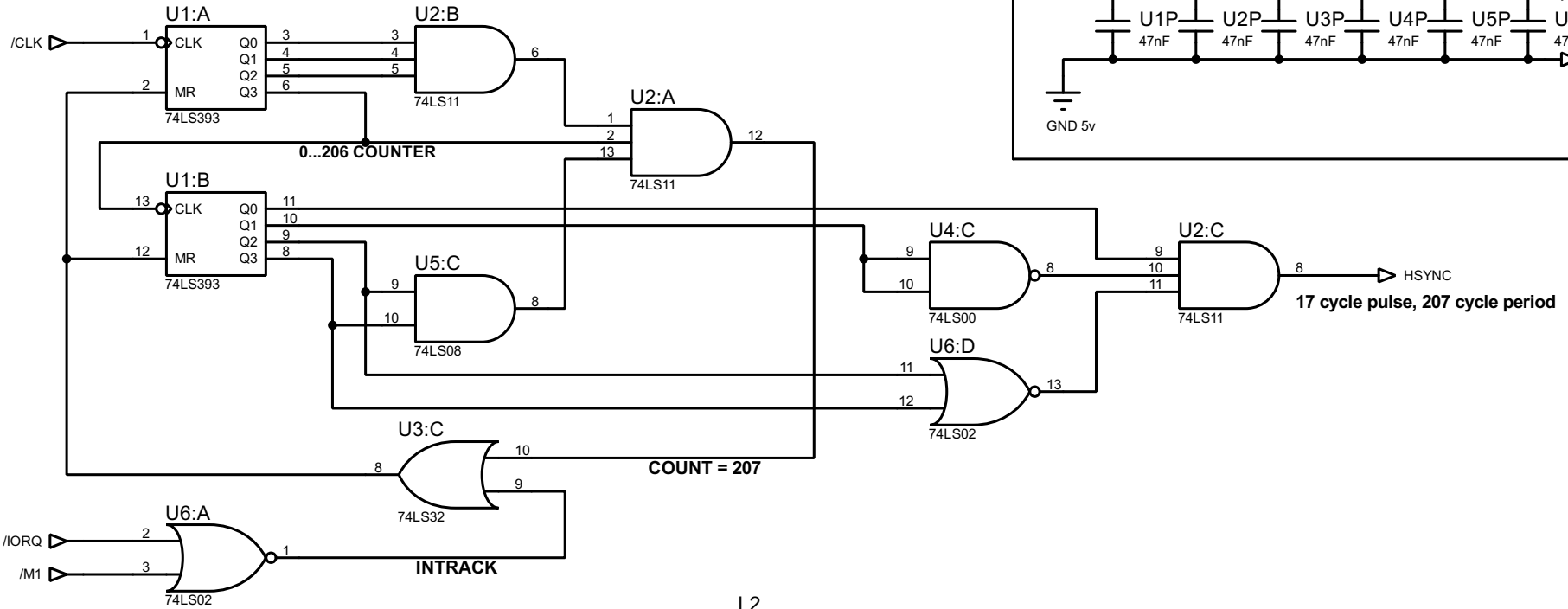


# EDGE CONECTOR



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# SYNC AND NMI PULSE GENERATOR

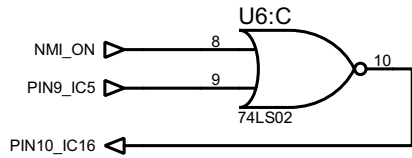


**ZX81 Project - ZX81 Slow**

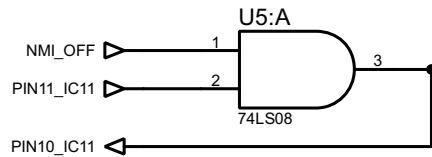
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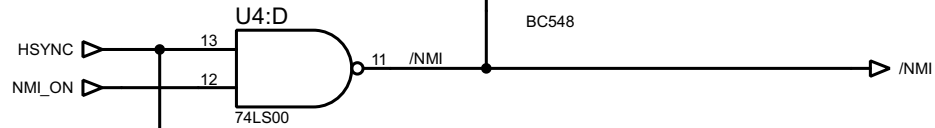
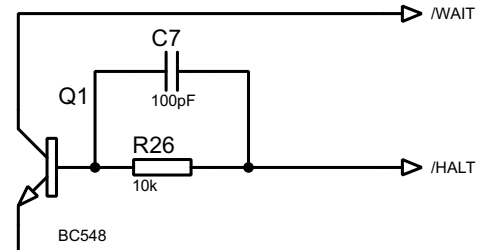
### VIDEO LOGIC DISABLE



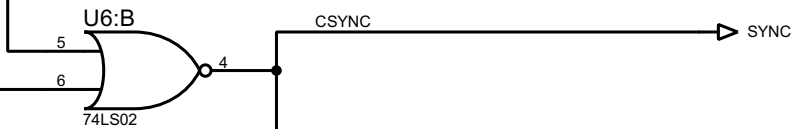
### SYNC LOGIC DISABLE



### T-STATE SYNCHRONIZER

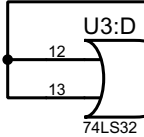


### SYNC MIXER



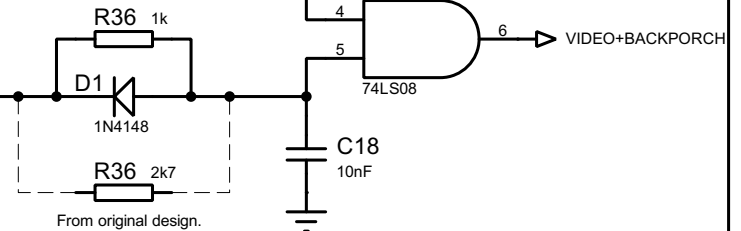
### WHITE-LEVEL RESTORATION

*(Optional, but recommended)*



### SYNC PULSE STRETCHER

New fixed version



Back porch Grant Searle solution

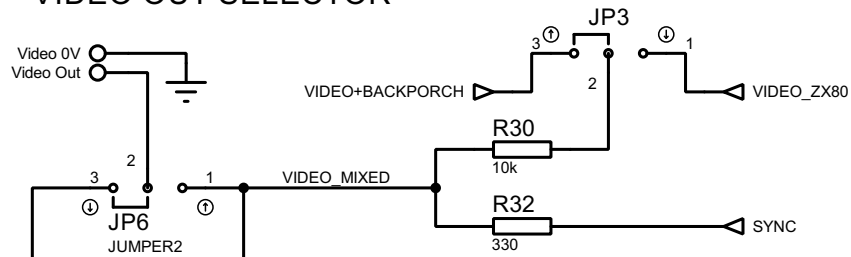
From original design.

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Based on original design by Grant Seale

## VIDEO OUT SELECTOR



Back porch Grant Searle solution:

JP3 = 2-3

JP5 = OFF

JP6 = 1-2

Back porch generation José Leandro solution:

Adjust image with R37 & R33

JP3 = 1-2

JP5 = ON

JP6 = 2-3

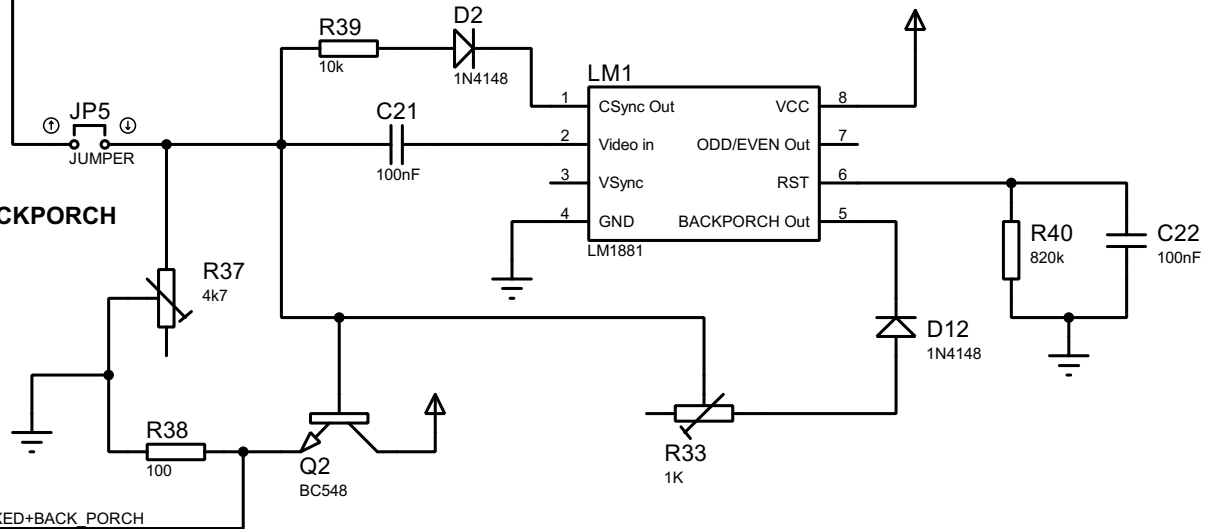
Without Backporch generation (original ZX80 video)

JP3 = 1-2

JP5 = OFF

JP6 = 1-2

## VIDEO + BACKPORCH



Back porch generation José Leandro solution

## ZX81 Project - Video BP

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Based on original design by José Leandro