

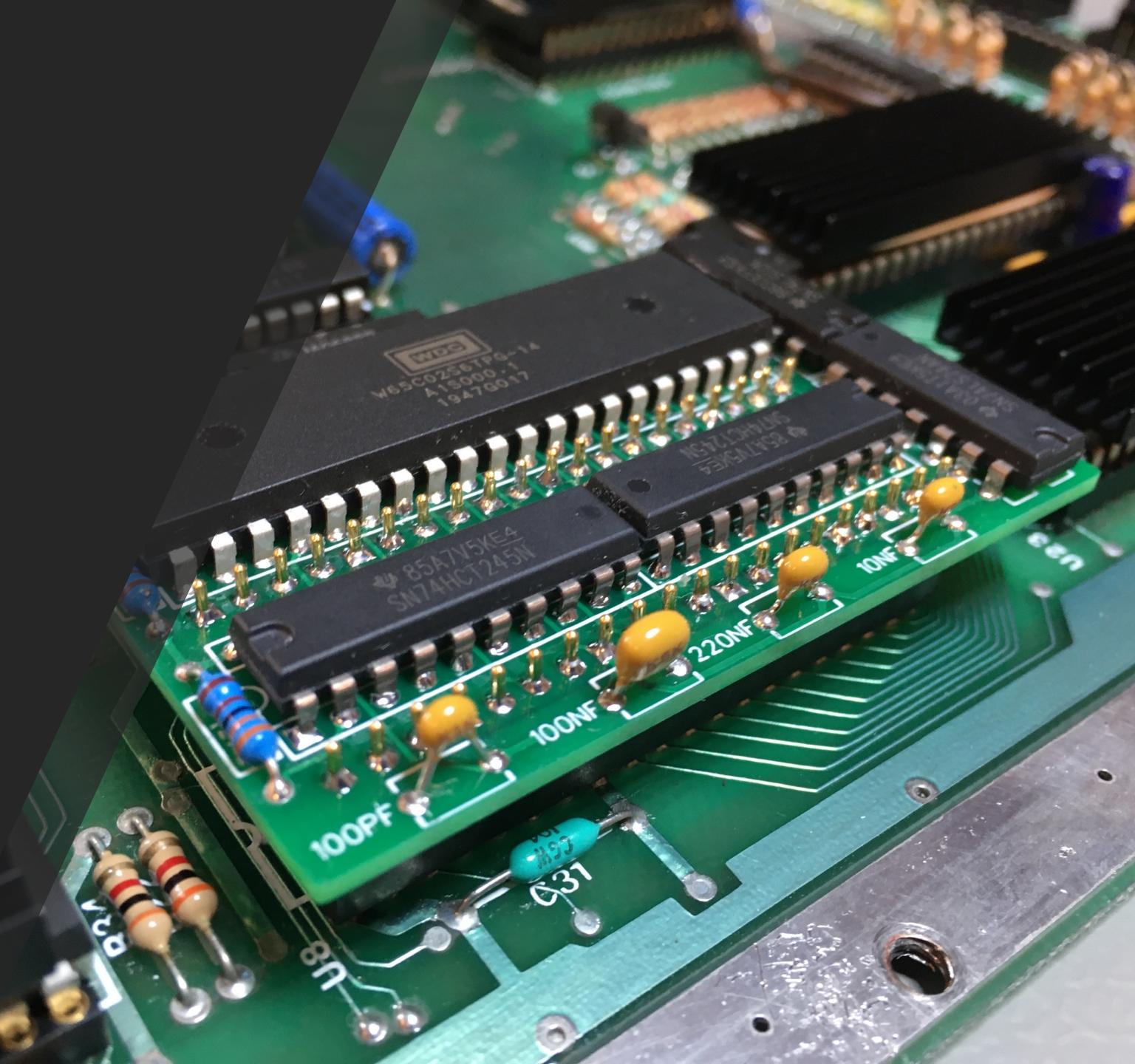
Atari “Sally” CPU Replacement Adapter

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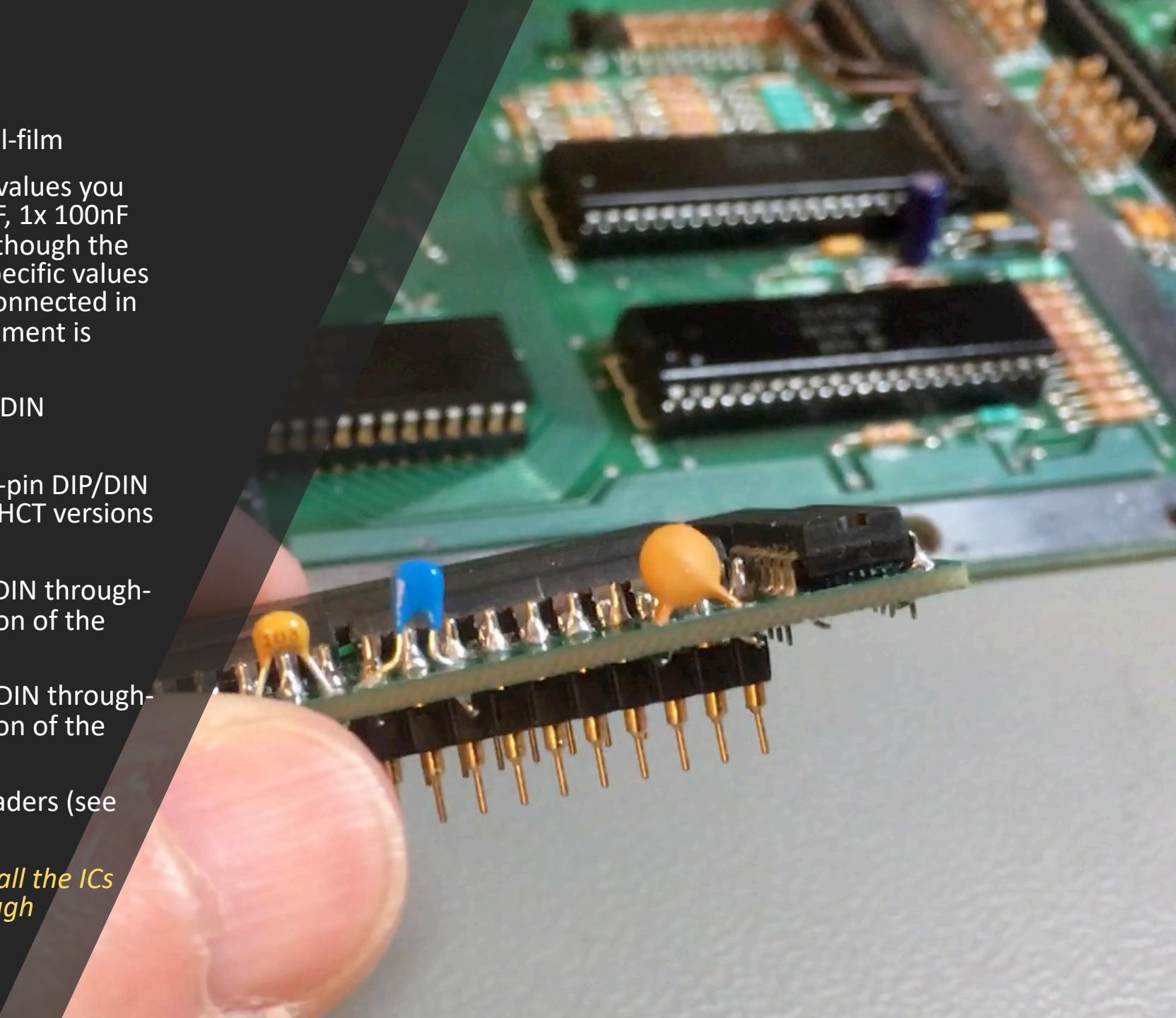
Introduction

- This is a small adapter, in the form of a daughter board, which can be inserted into the existing “Sally” CPU socket in an Atari 800XL, 65XE or 130XE
- It replaces the custom “Sally” CPU with a modern CMOS, low-power, fully static, currently in production W65C02S CPU and some auxiliary logic
- This adapter board has been successfully tested in both an Atari 800XL and a 130XE. It works flawlessly in both cases, as far as I can ascertain
- *IMPORTANT: YouTuber Jan Beta, in a recent video, tried the adapter in a 65XE and the result was unstable: image flicker and many applications didn't run properly; it is unclear why, as the 65XE is largely identical to the 130XE*
- *IMPORTANT: To use this adapter you will have to remove the Atari's RF shield, because the daughter board won't fit under it*



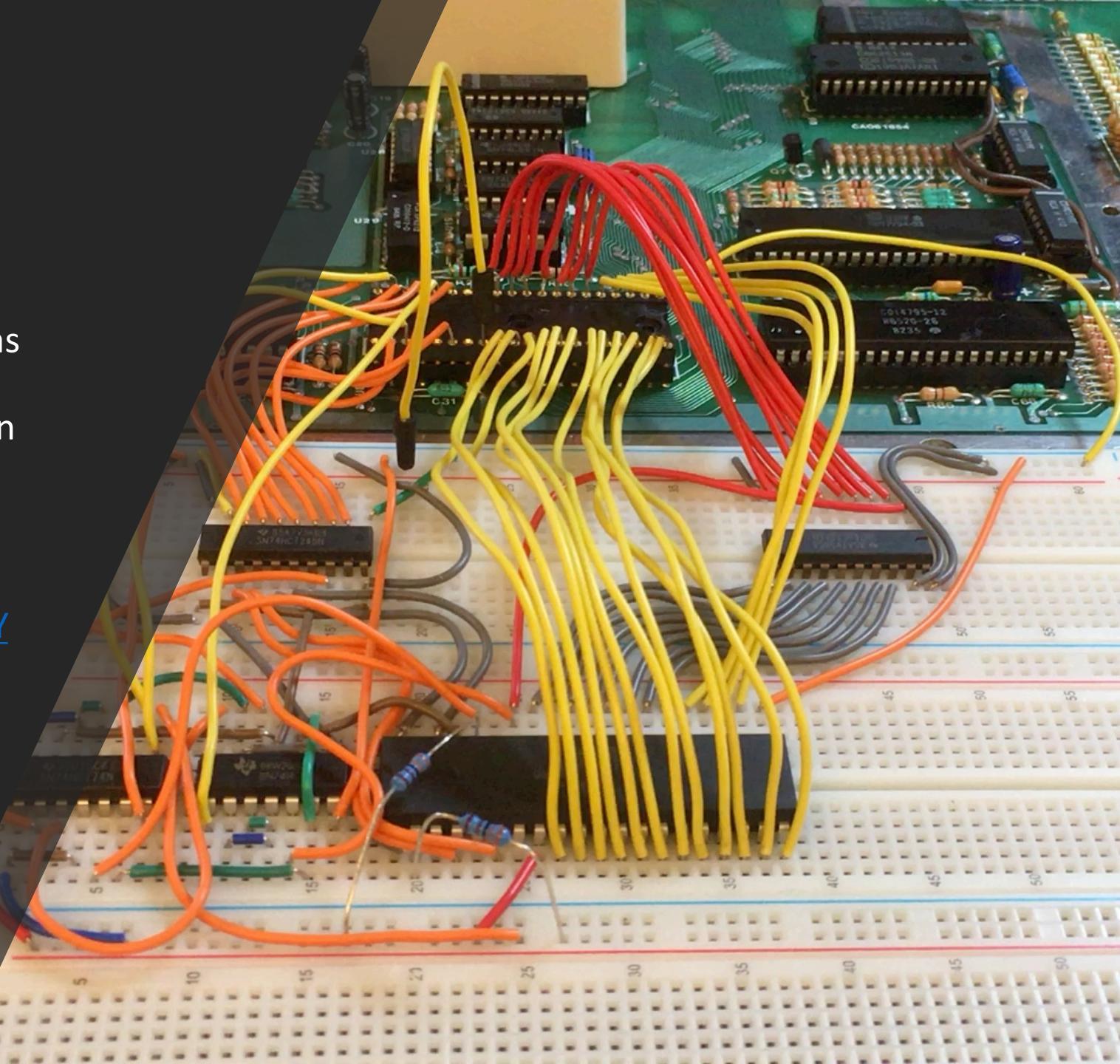
Components

- 2x 3K3 Ohm resistors, preferably metal-film
- 4x bypass capacitors. You can use the values you prefer. I recommend 1x 100pF, 1x 10nF, 1x 100nF and 1x 220nF, ceramic or tantalum. Although the board's silkscreen markings identify specific values for each position, the capacitors are connected in parallel. Therefore, their relative placement is unimportant.
- 1x W65C02S6TPG-14 CPU, 40-pin DIP/DIN through-hole package
- 2x SN74HCT245N bus transceivers, 20-pin DIP/DIN through-hole package (these *must* be HCT versions of the 74245)
- 1x SN74LS74AN flip-flops, 14-pin DIP/DIN through-hole package (this *must* be an LS version of the 7474)
- 1x SN74LS02N NOR gates, 14-pin DIP/DIN through-hole package (this *must* be an LS version of the 7402)
- 2x 20-pin, single-row precision pin-headers (see photo for a reference)
- *In an 800XL, do not use sockets to install the ICs above, as the case does not have enough vertical space for those*



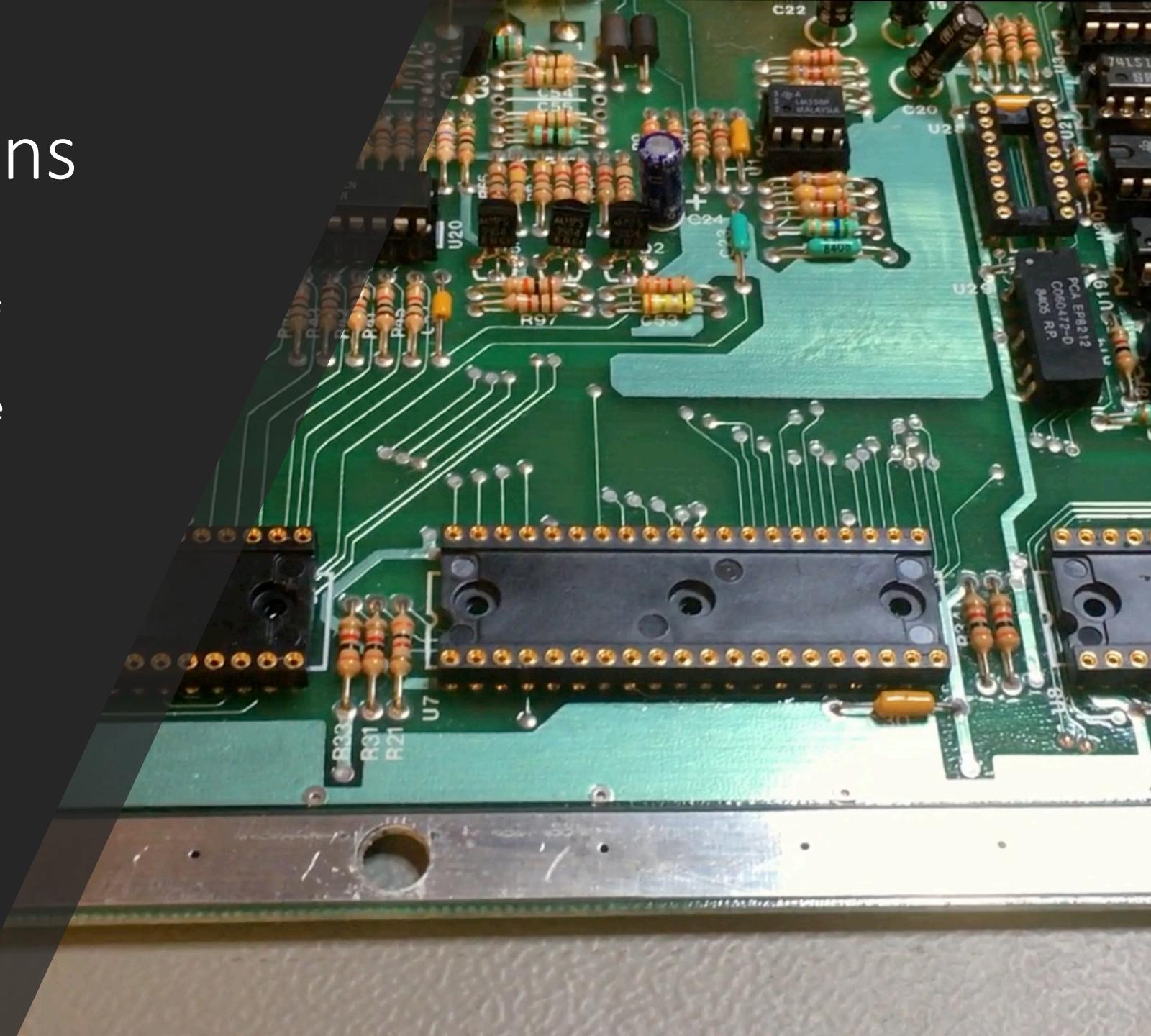
Project history

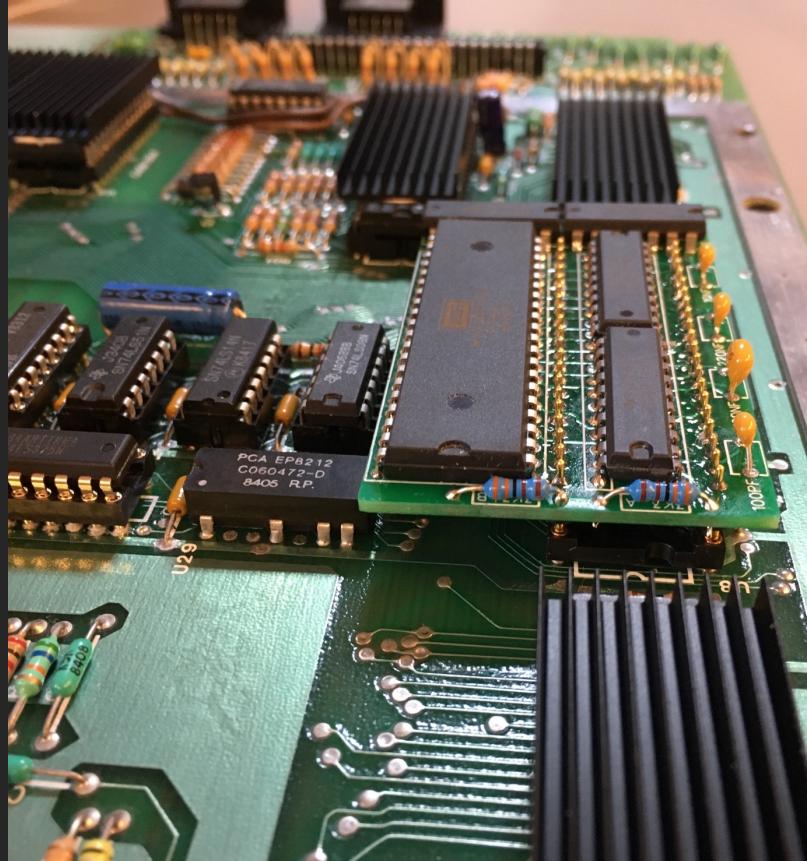
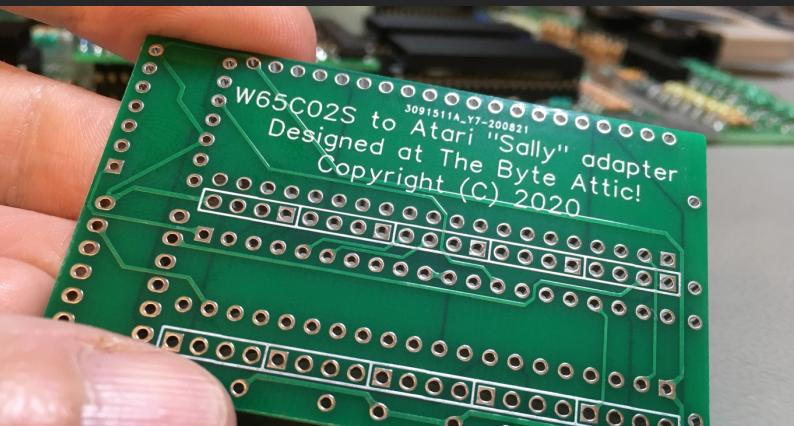
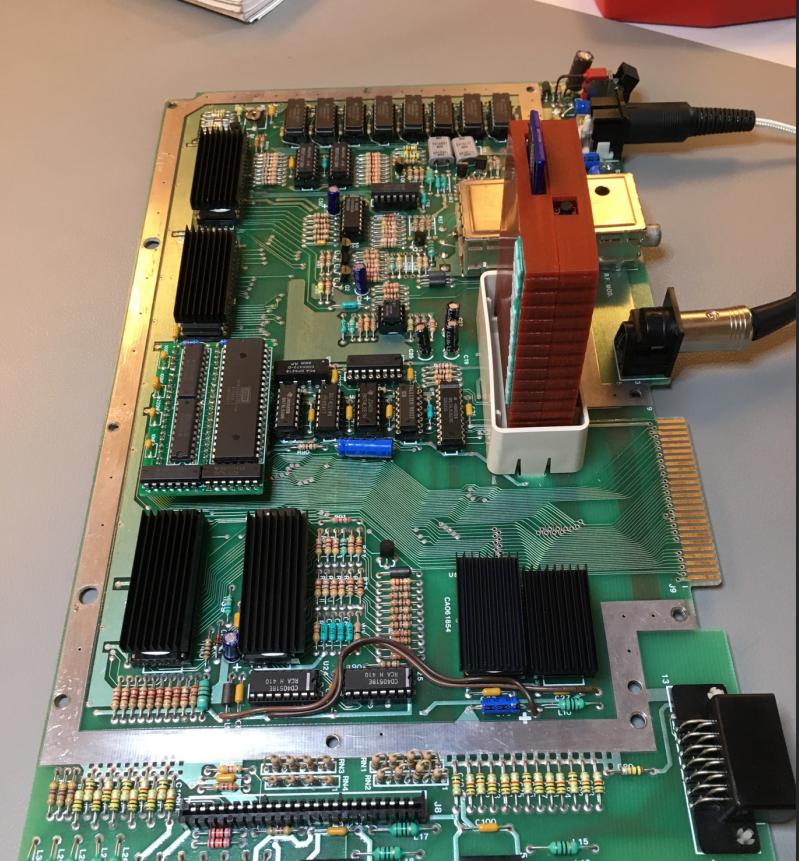
- The full development of this board has been documented in three ~30 min videos available online (watch them in the order indicated):
 1. <https://youtu.be/iTJLFSFqFeE>
 2. https://youtu.be/_dQt8z0tesA
 3. <https://youtu.be/t45KnSQZGyY>



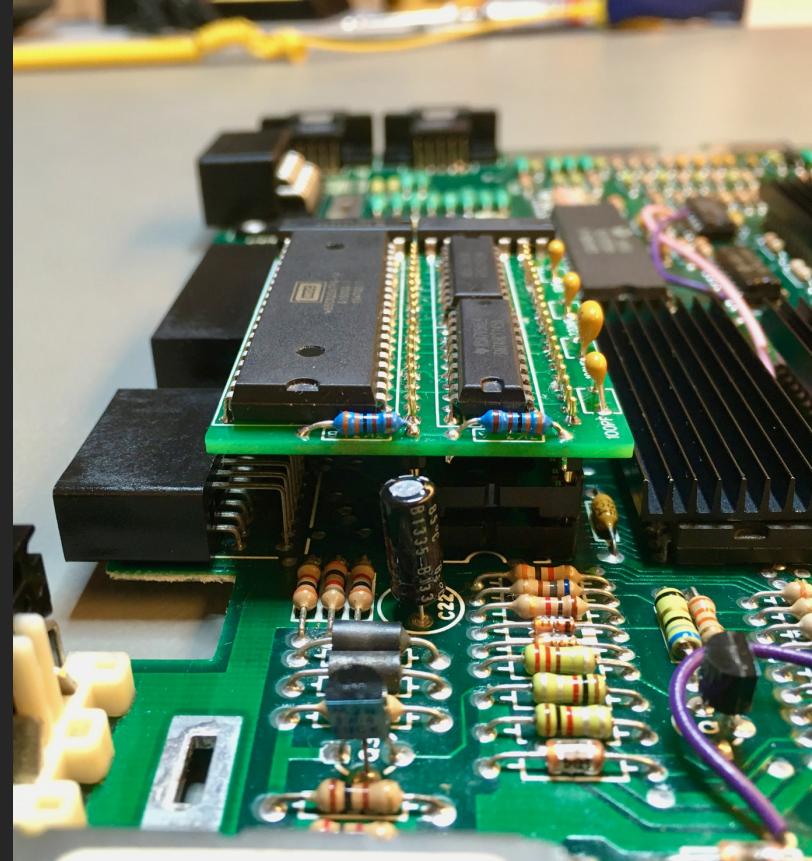
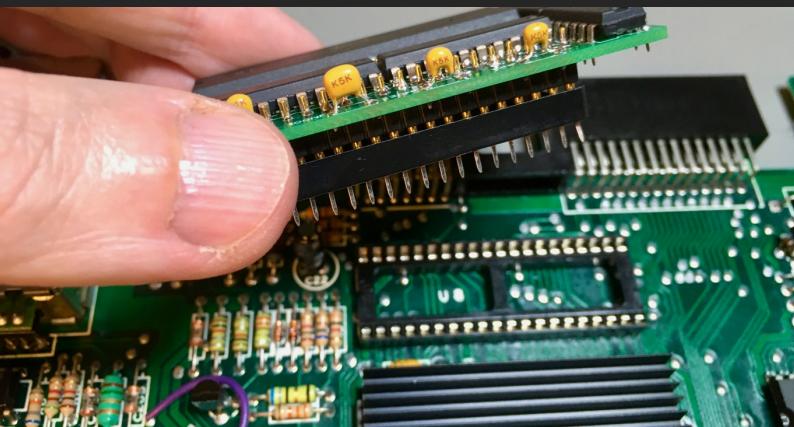
Recommendations

- The Atari 8-bit computers are timing-sensitive due to the use of two-phase clocks
- Therefore, it is important that the daughter board makes optimal contact with the underlying circuitry
- To ensure this, I recommend replacing the original Atari CPU socket with a gold-plated precision alternative (see photo)
- To physically fit the adapter in an 65XE or 130XE, I recommend a stack of two sockets on top of each other





The adapter in an 800XL



The adapter in an 130XE
(see stack of two sockets)

Disclaimer

- Should you choose to use any of the files in this repository for any purpose whatsoever, you do so entirely at your own risk. I offer no guarantees, representations or warranties of any kind and disclaim all responsibility for any damage incurred as a direct or indirect result of such use.

