Embedded Engineering & Vintage Computing Fun

Search products…

Home Cart Checkout Forum My Account Shop Consulting About Us $0.00 0 items

Documentation Shows Technical Updates Downloads Franklin

SS-50 FAQs SD Card Tech Details Contact Us Tech Tips

Engineering Experiments

Search …

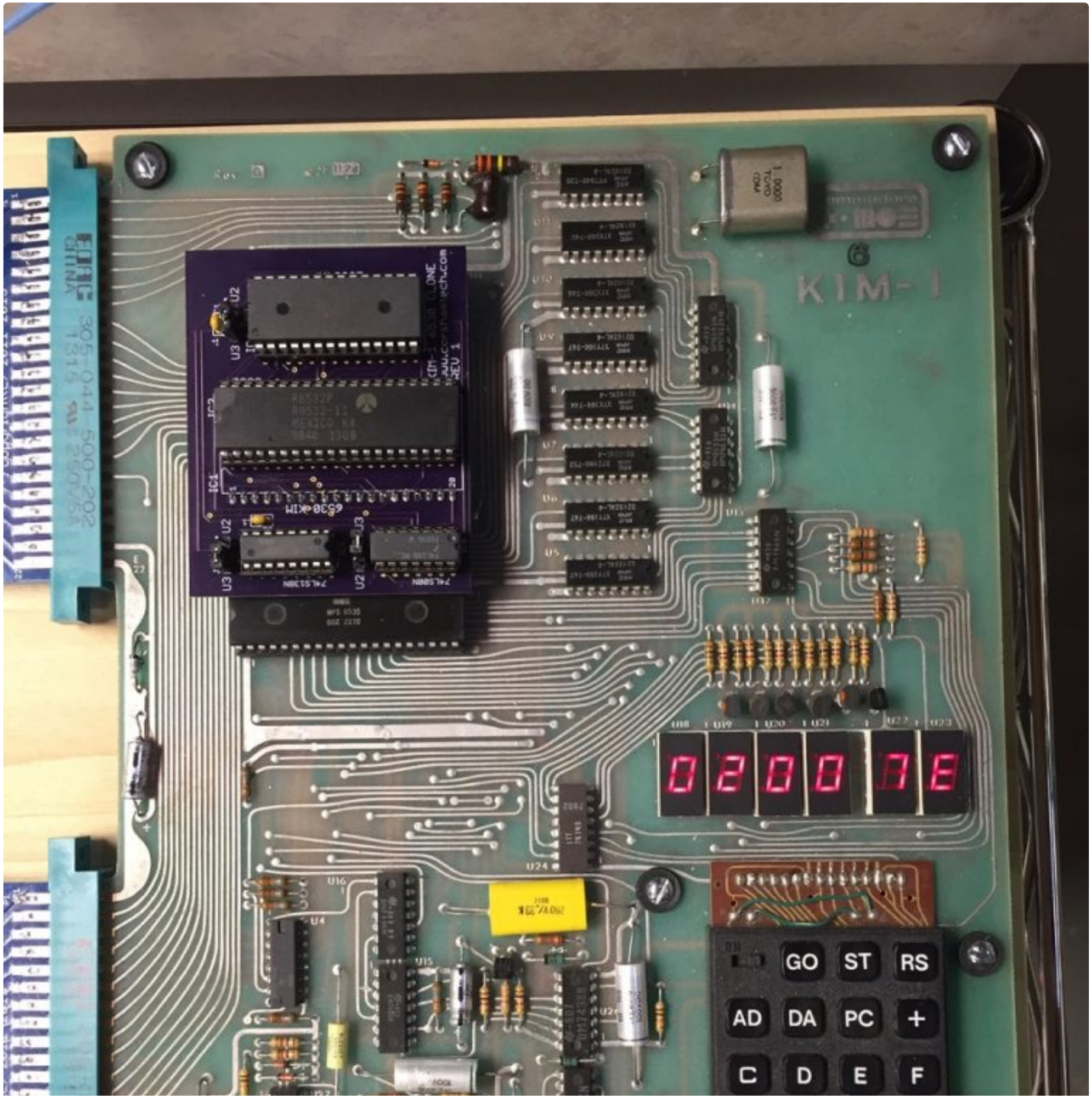
Home › Tech Tips › KIM 6530 Replacement

KIM 6530 Replacement

Search:

03/07/2017

I tested the board in both U2 and U3 and it appears to work fine. Here it is in U3:



Days until **VCF Midwest** (Chicago, IL): **0**

Days until **VCF Pacific-Northwest** (Seattle, WA): **0**

Other Items

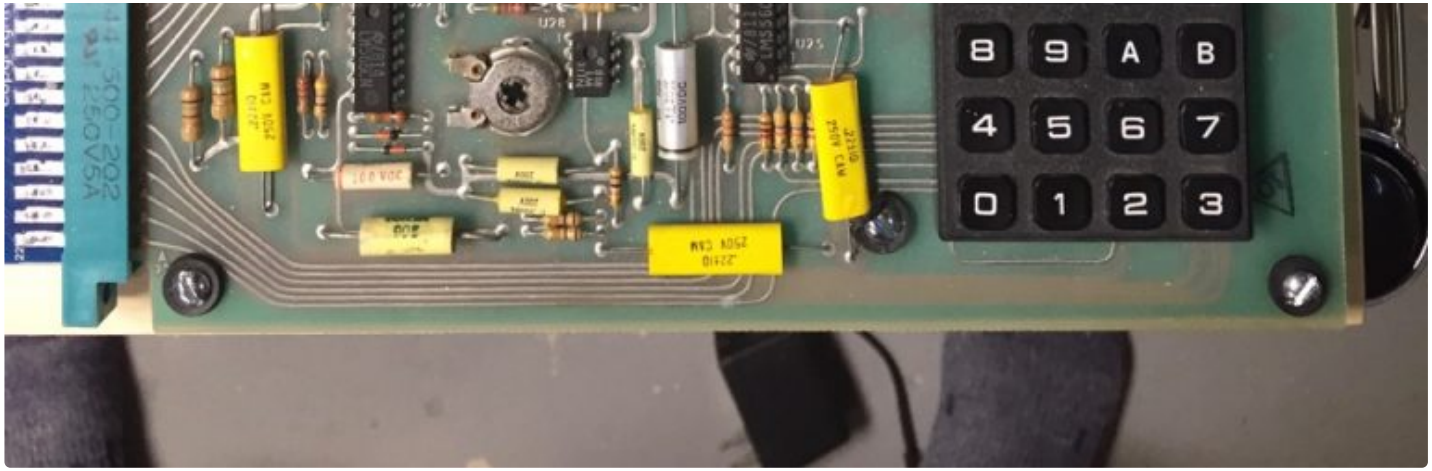
Days until Christmas: **0**

Recent Posts

- **Arm updates, shipments, etc**
- **Update on arm, deliveries, etc**
- **Broke my arm, expect delays**
- **Parts Shortage Continues**
- **Orders are Getting Shipped Again!**

Archives

- **March 2022**
- **February 2022**
- **January 2022**



03/03/2017:

See the bottom of the page for the GERBER and EAGLE files.

Near the bottom is a picture of my board working in one of the KIMs here in the lab.

Introduction

Like many people, I have a KIM-1 in my collection with a dead 6530 chip. Fortunately mine wasn't too bad, but one of the I/O pins didn't work so the display always had one segment lit and the TTY port would not work. After many hours of searching for a way to replace this one defective chip with an equivalent circuit, it became apparent a lot of people were trying to do the same thing, some claiming to have a solution, some not, but no schematics ever appeared. Without schematics, there is no solution.

Rather than letting others go through all the effort to reverse engineer the 6530, I decided to make my own, and to publish the schematic. This work was heavily taken from Ruud's excellent tutorial on his efforts to

December 2021
November 2021
October 2021
September 2021
June 2021
April 2021
March 2021
February 2021
January 2021
November 2020
October 2020
September 2020
August 2020
July 2020
June 2020
May 2020
April 2020
March 2020
February 2020
January 2020
December 2019

replace a 6530 in a Commodore disk drive. Please go to his page for an explanation:

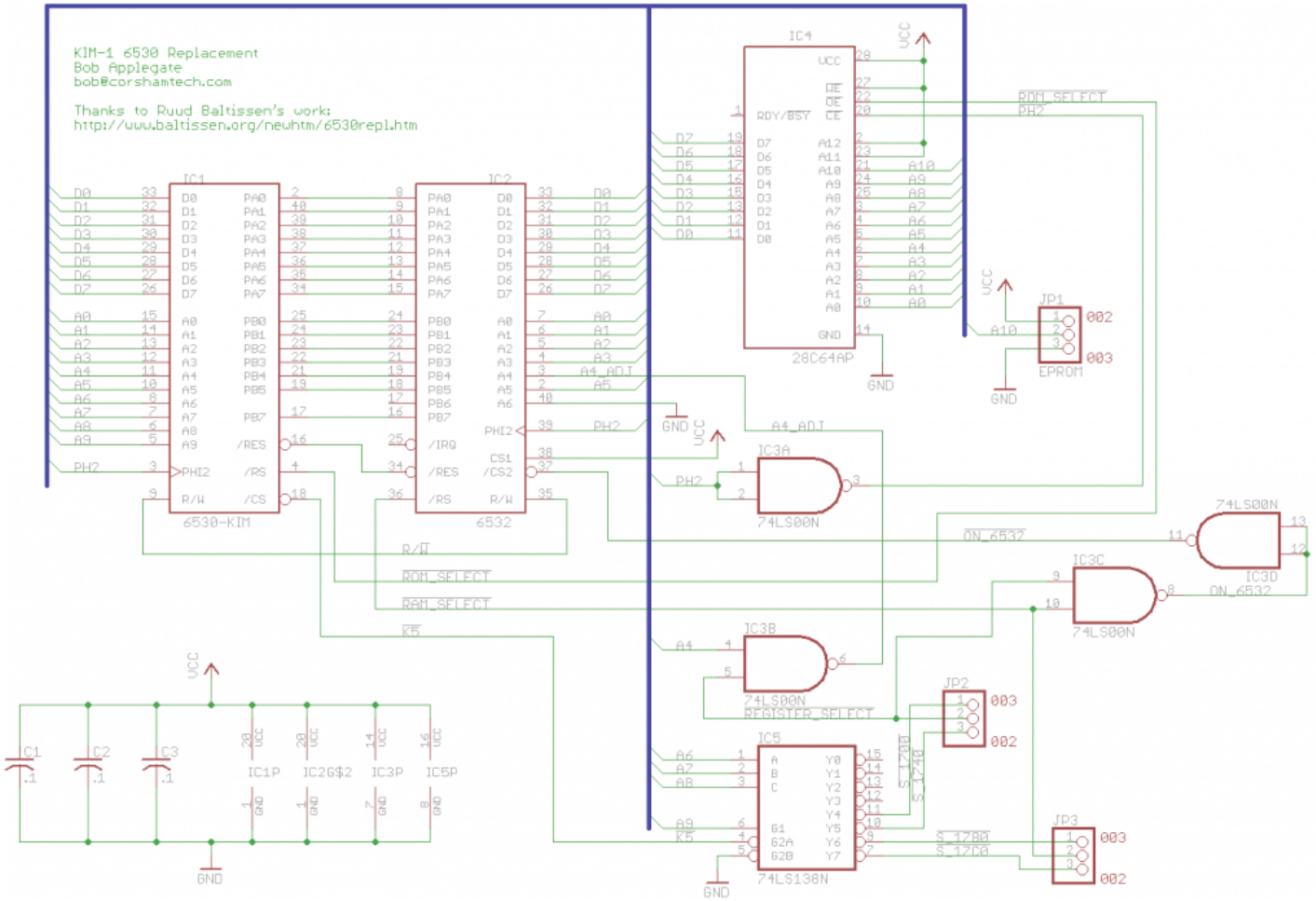
http://www.baltissen.org/newhtm/6530repl.htm

Since the 6530-002 and 6530-003 in the KIM have different mapping of ports, his exact schematic is not right for the KIM, so I borrowed some of his KIM-1 clone ideas and designed my board from it.

Saturday, Feb 18, 2017

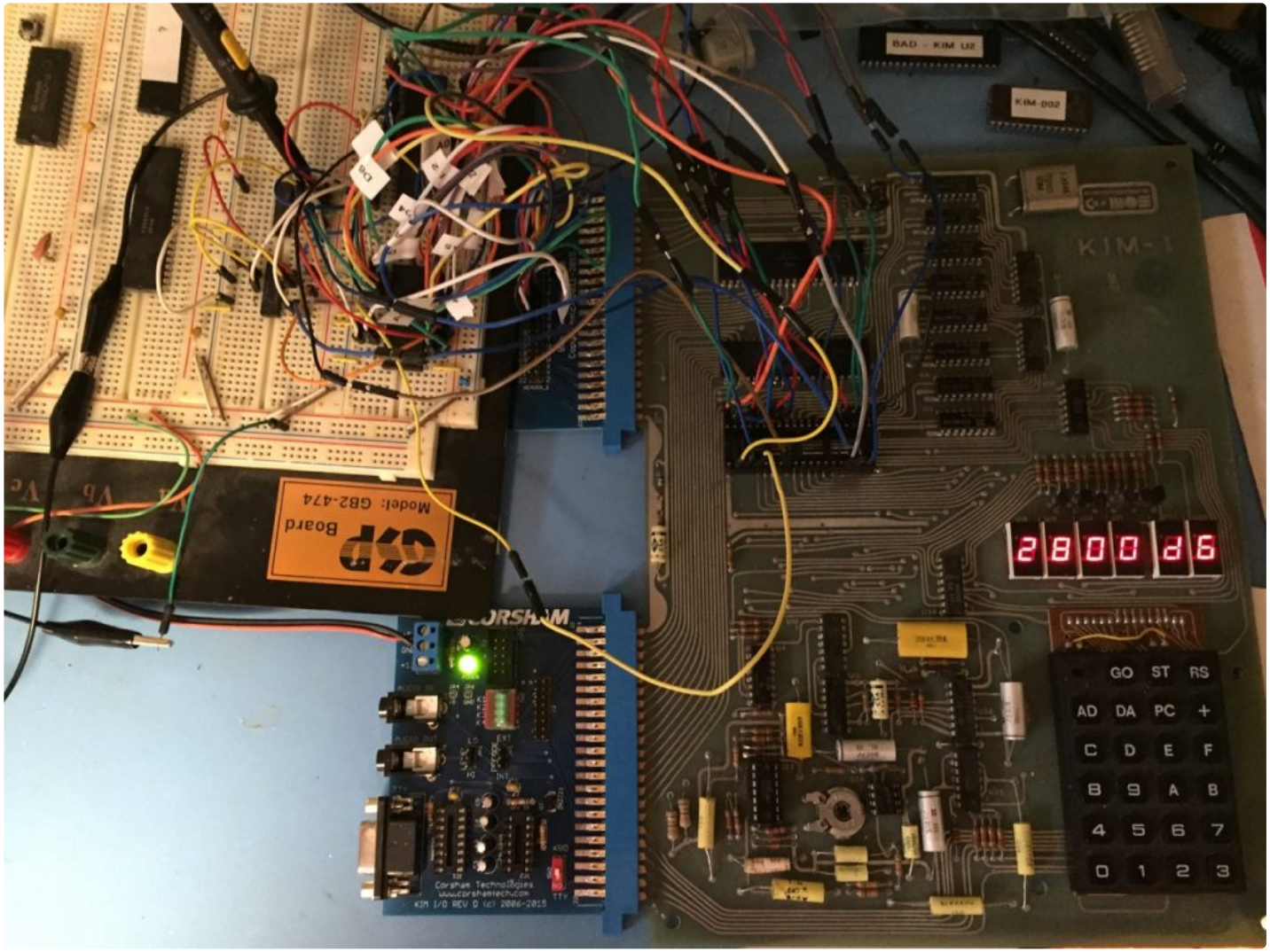
This is the current design that's breadboarded and running on one of my KIMs:

November 2019
October 2019
September 2019
August 2019
July 2019
June 2019
May 2019
April 2019
March 2019
February 2019
January 2019
December 2018
November 2018
October 2018
September 2018
August 2018
July 2018
June 2018
May 2018
March 2018
January 2018



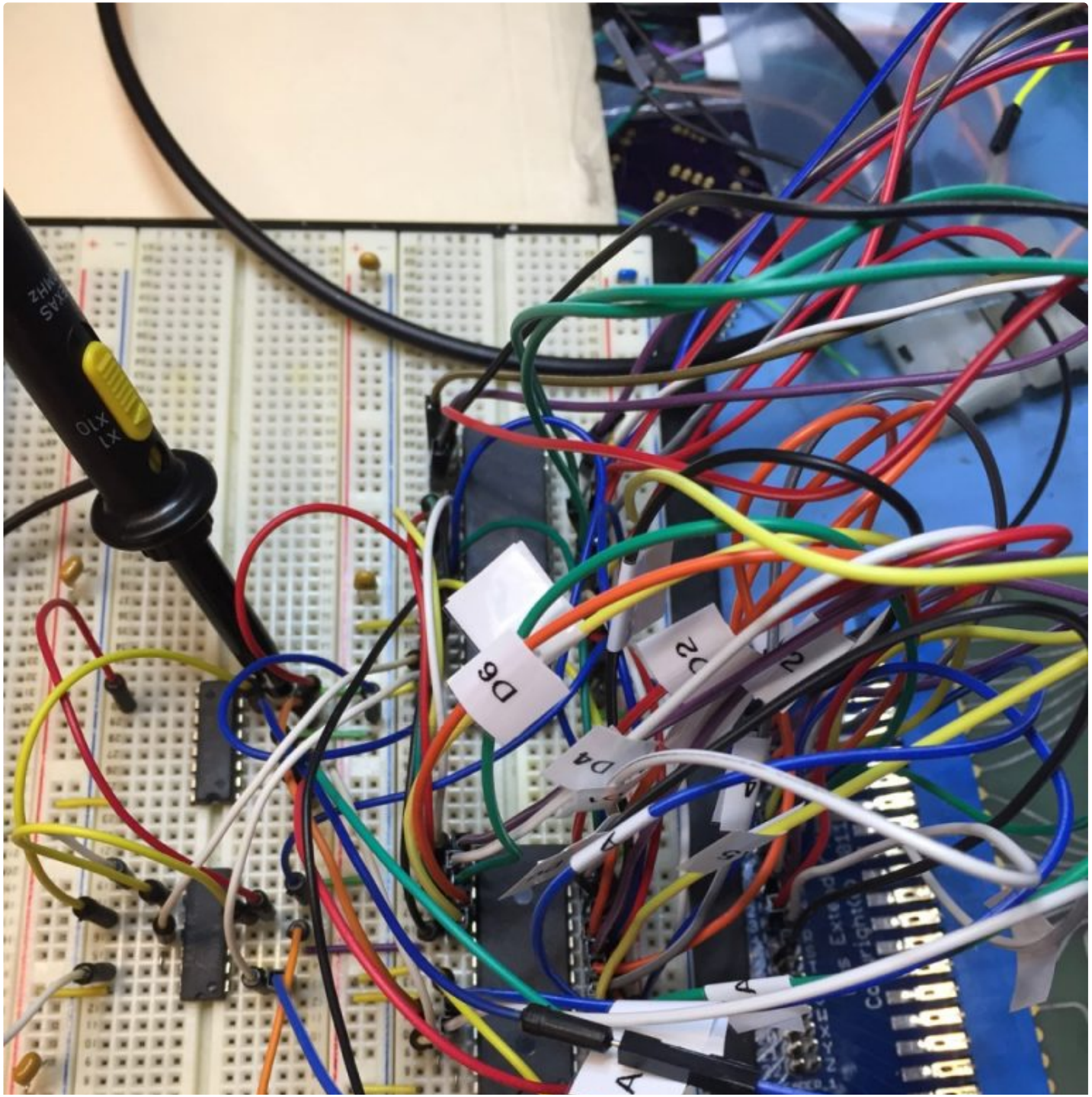
For those who think schematic diagrams are complicated, just wire it exactly like I did:

December 2017
November 2017
October 2017
September 2017
August 2017
July 2017
June 2017
May 2017
April 2017
March 2017
February 2017
January 2017
December 2016
November 2016
October 2016
September 2016
August 2016
July 2016
June 2016
May 2016
April 2016



Need a slightly closer view?

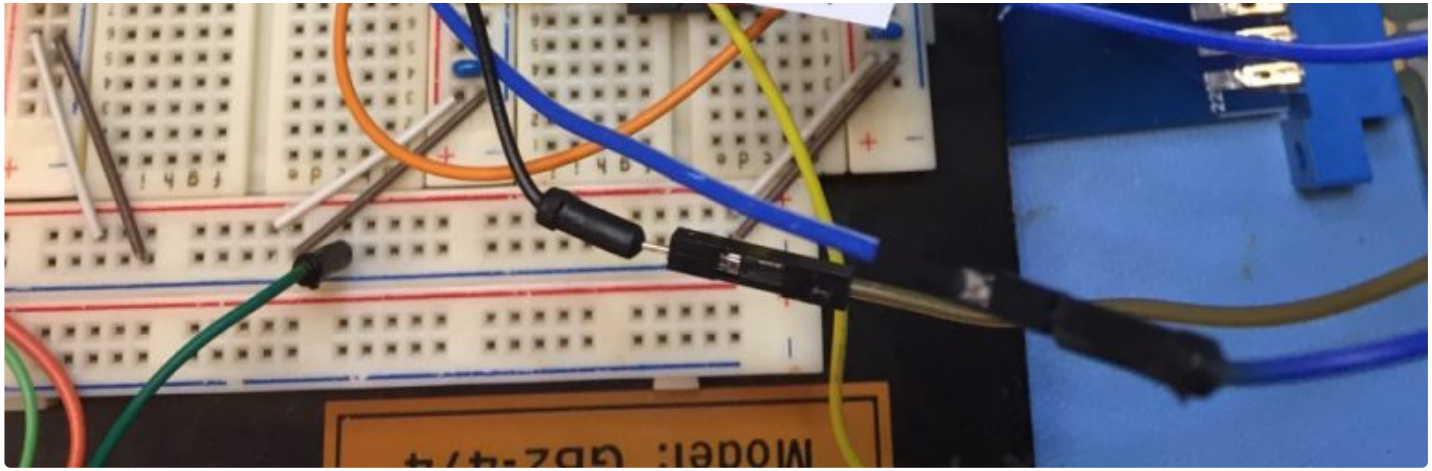
March 2016
January 2016
December 2015
November 2015
October 2015
September 2015
August 2015
July 2015
May 2015
April 2015
March 2015
February 2015
January 2015
December 2014
October 2014
September 2014
August 2014
July 2014
June 2014
May 2014
April 2014



March 2014
May 2013
March 2013
February 2013
January 2013
December 2012
November 2012

Categories

Fun Stuff
Ham Radio
My Health
New Products
Release Updates
Shows
Taxes
Uncategorized
Vintage Computers
Web Pages



Okay, the schematic is much easier to follow 😉 Notice that I use one of our 22/44 pin extenders to access the data and address busses so there are fewer jumpers to the original 6530 socket on the main KIM board. It's also a great way to get access to test points, like pin 1 which has the 6502 SYNC pin which pulses high on every opcode fetch. I kept one scope probe on that pin to make sure the processor was still running after making circuit changes. Also note that I label each wire coming from the KIM so it's easier to double-check and debug later.

Notes

- No, the schematic is not pretty. I can spend some time and shuffle parts around to make the parts placement neater, but if you're contemplating building this, I'm sure you'll have no problems following the schematic.
- Pin usage has not been optimized. This was breadboarded but the PC board design is not done so some of the pins on the 74LS00 might change.

- There are three jumpers with U2 and 003. The intent was to be able to replace either of the two 6530s on the KIM and both U2 and U3 have been tested.
- A 28C64 EPROM was chosen because (A) they're readily available, (B) common USB programmers can program them, and (C) the offset in an Intel HEX file for the KIM PROMs will be at the proper offset when you load the files into your programmer's memory. Ie, the 002 device's offset at 1C00 will be at offset 1C00 in the EEPROM.

EEPROM Contents

The basic KIM has an 8K memory map so using an 8K EPROM/EEPROM makes things easier because the address in the HEX file is exactly the right offset into the EPROM. If you don't understand this, don't worry, you don't need to.

I deleted the two individual hex files and replaced it with a single file that covers both halves of the KIM PROM:

KIM-ROM.HEX

The image is a raw dump from a working KIM, not re-assembled from source. Note that I had to add an extension of txt so that WordPress would allow me to upload them, but take off that extension when you save them to your computer.

Design Files

Bare boards are on their way, but these are the files you can use to generate your own. First, this is the GERBER file fro the revision 1 boards I sent to have boards produced. If you want to make your own boards

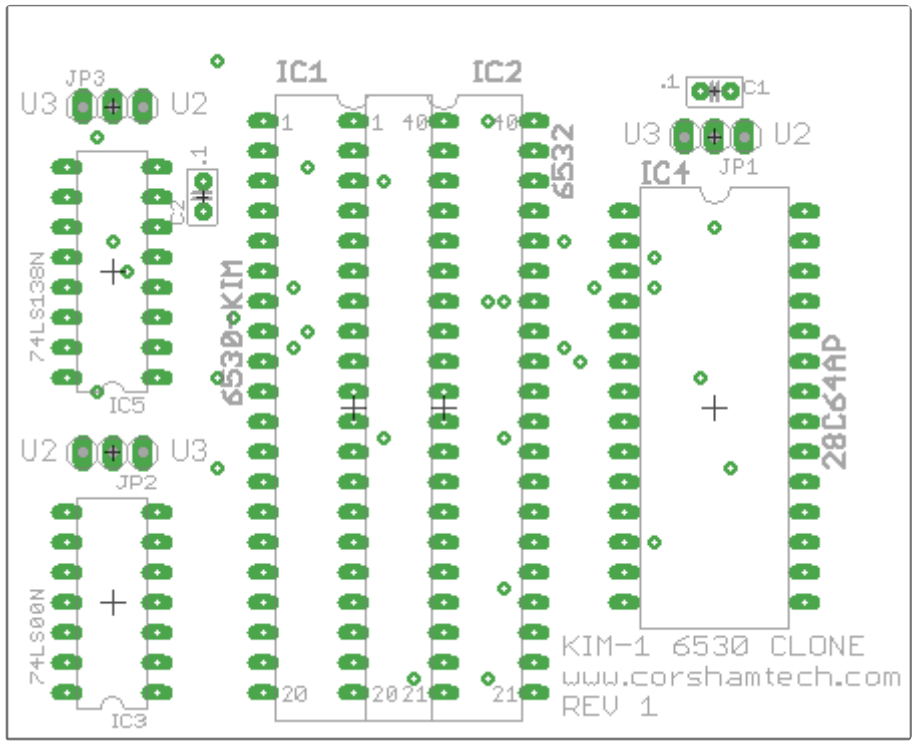
without any modifications then just upload this file to your favorite PC board manufacturer and they can give you a quote:

KIM_6530_rev_1

If you use the EAGLE CAD package, here are the files needed for the project. This has the epf, brd and sch files:

EAGLE_6530_rev_1

BTW, this is what the top layer of the board looks like, minus any traces:

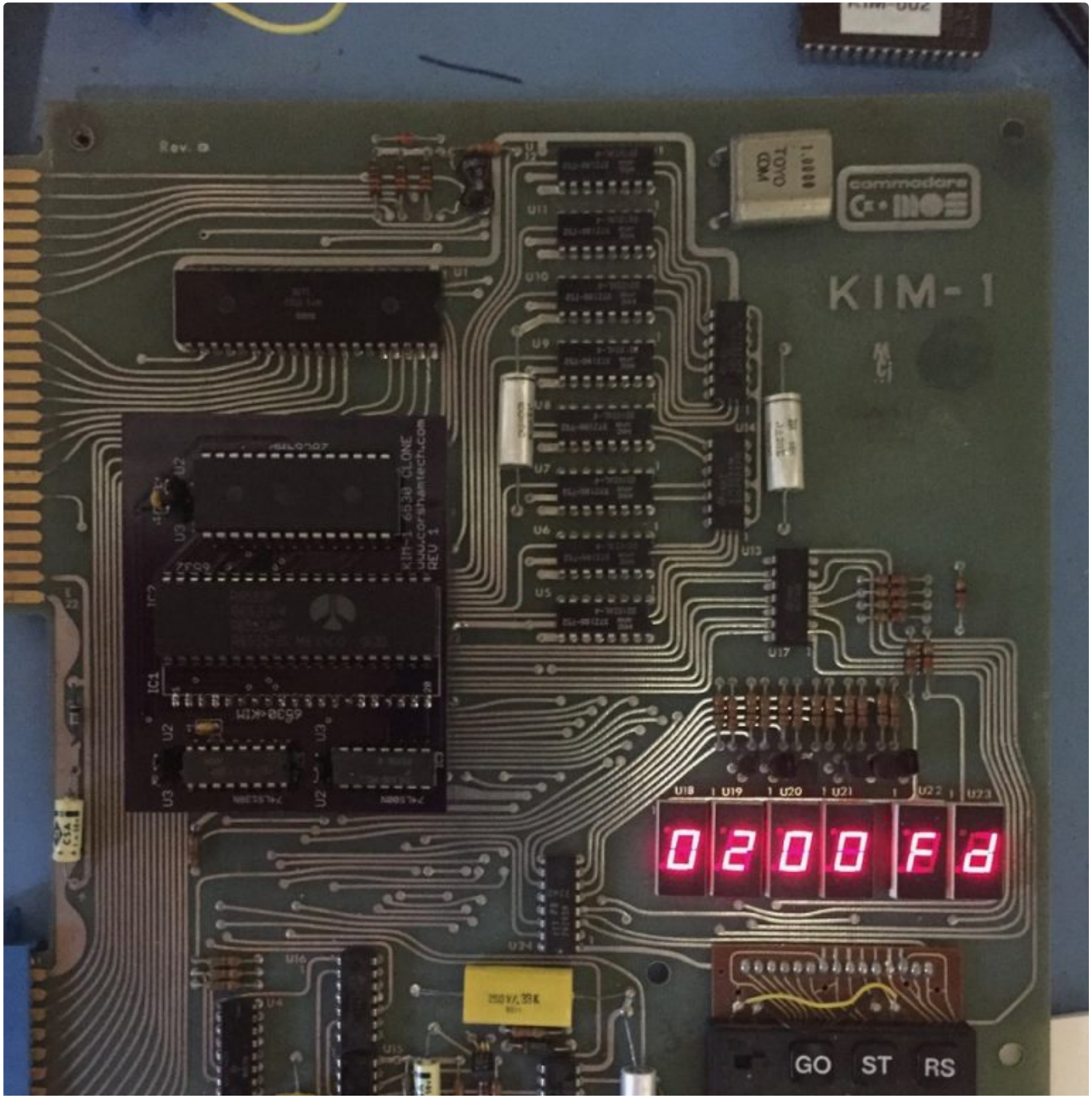


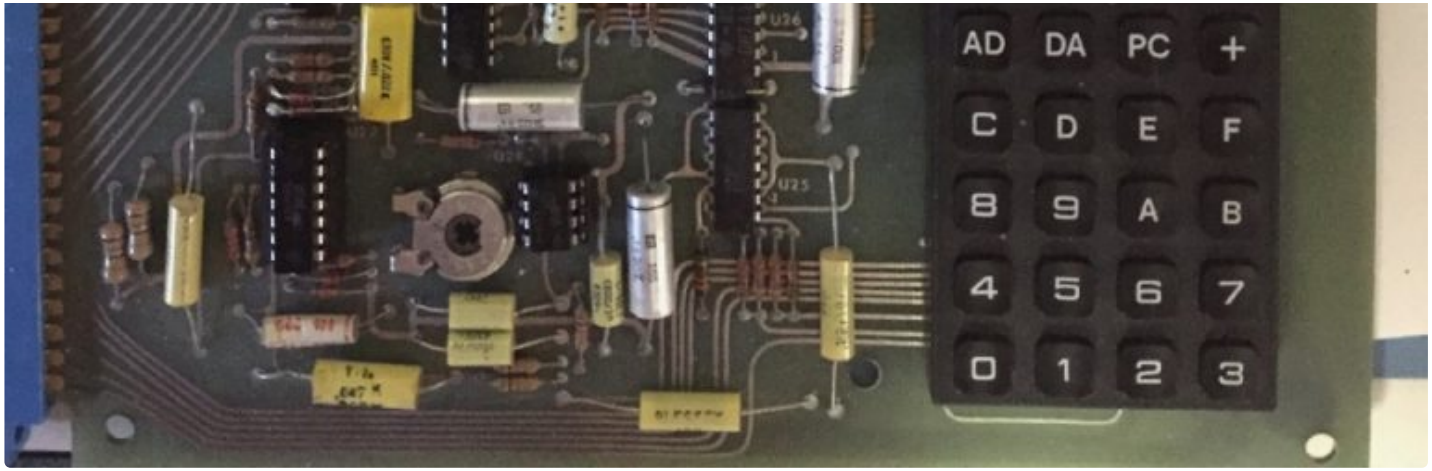
Just like Ruud's original design, this has the 6530 header and 6532 socket overlapping each other. For the header that is soldered to the underside of the PC board and plugs into the KIM, I suggest a header with narrow pins. I used CNC Tech part number 220-1-40-006, available from Digikey as part number 1175-1527-5-ND. Be aware that the cross-pieces of the IC socket and the header will block the pins for the other, so you'll need to cut them from either the socket or the header (whichever you solder last).

VERY IMPORTANT: Notice that IC3 and IC5 are polarized exactly opposite from the others! When you insert sockets and chips, double-check you've got them oriented in the right direction!

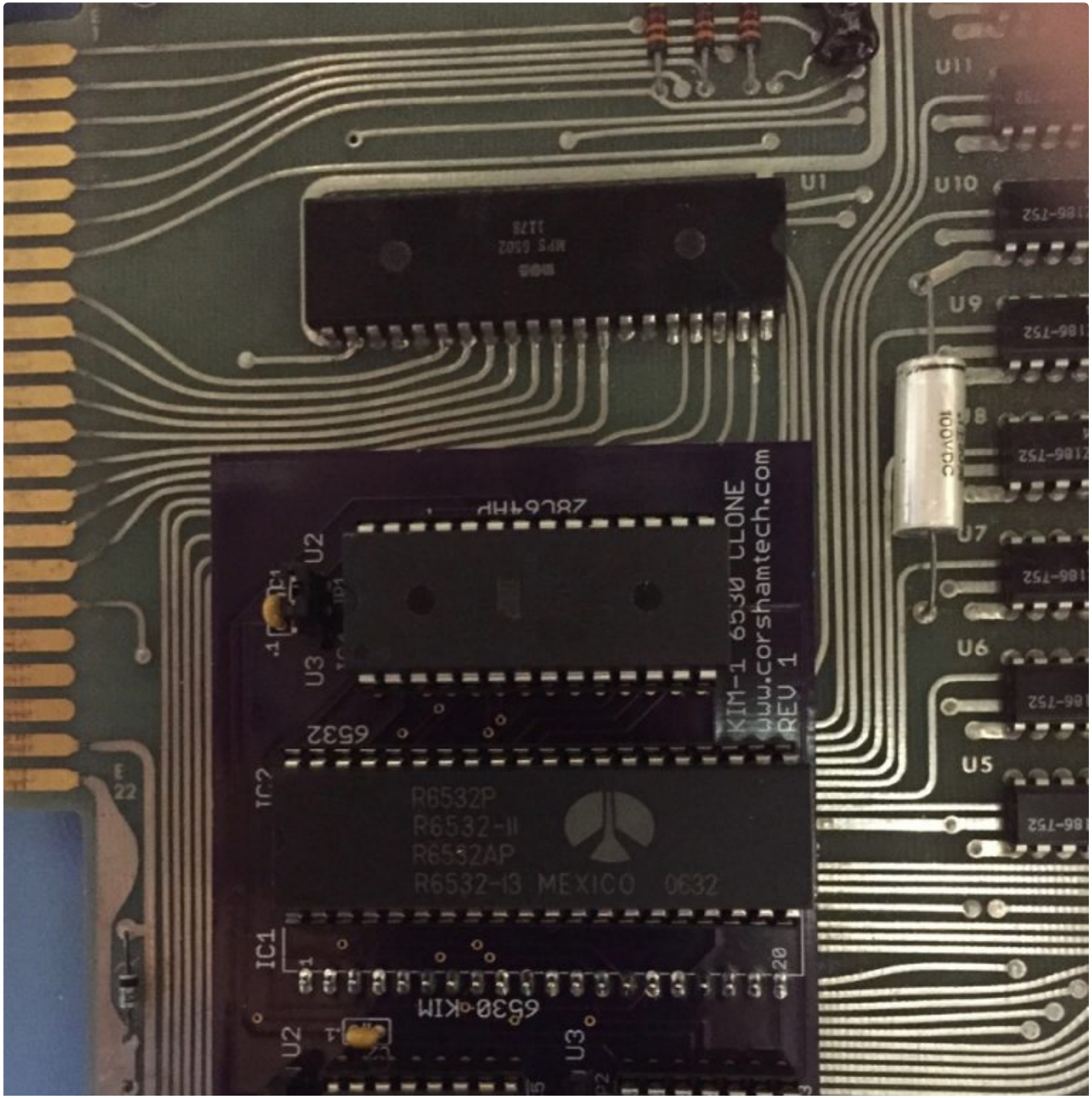
Prototype Boards Added 03/03/2017

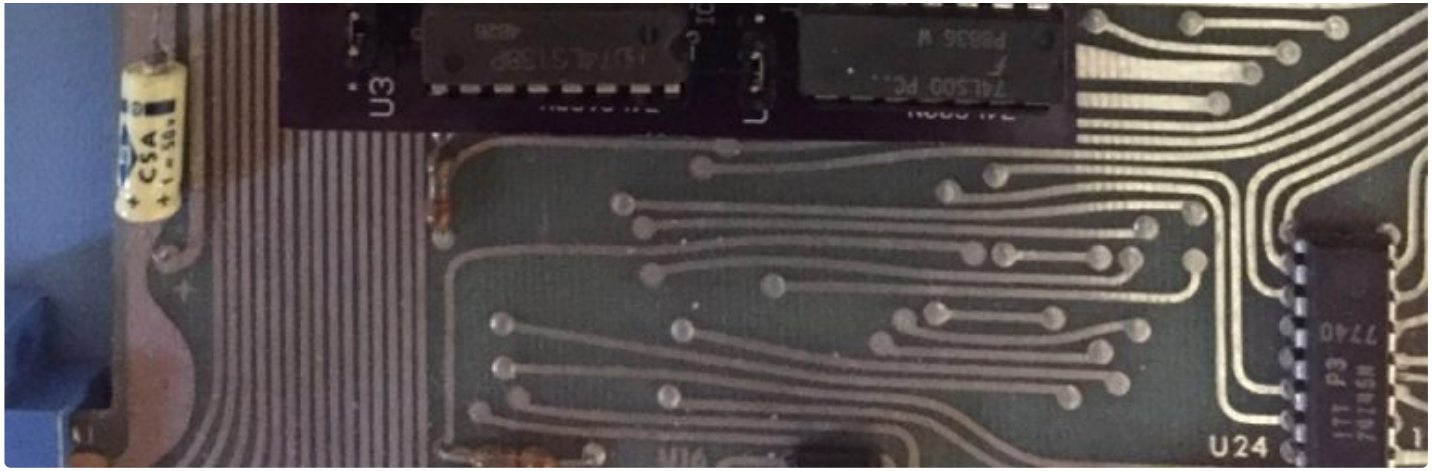
Prototypes arrived yesterday and work perfectly:


KIM-1
commodore
0200 Fd
GO ST RS



A close-up shot:


U11
U10
U9
U8
U7
U6
U5
U1
U2
U3
IC1
IC2
KIM-1 6530 CLONE
www.corshamtech.com
REV 1
6532
R6532P
R6532-II
R6532AP
R6532-13 MEXICO 0632
6530-KIM
100V DC



Search …

Meta

Log in
Entries feed
Comments feed
WordPress.org

Built with Storefront & WooCommerce.