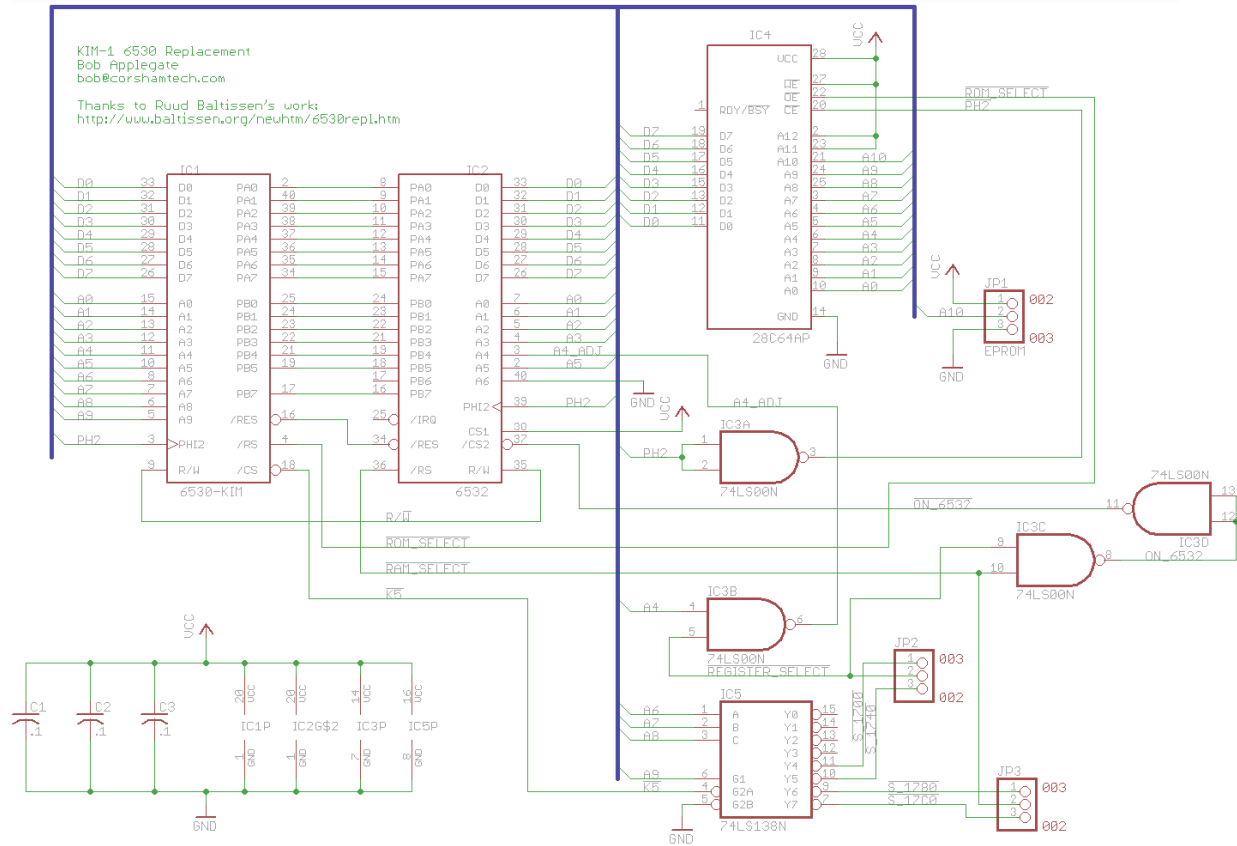# KIM 6530 Replacement

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 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.

This is the current design that's breadboarded and running on one of my KIMs:
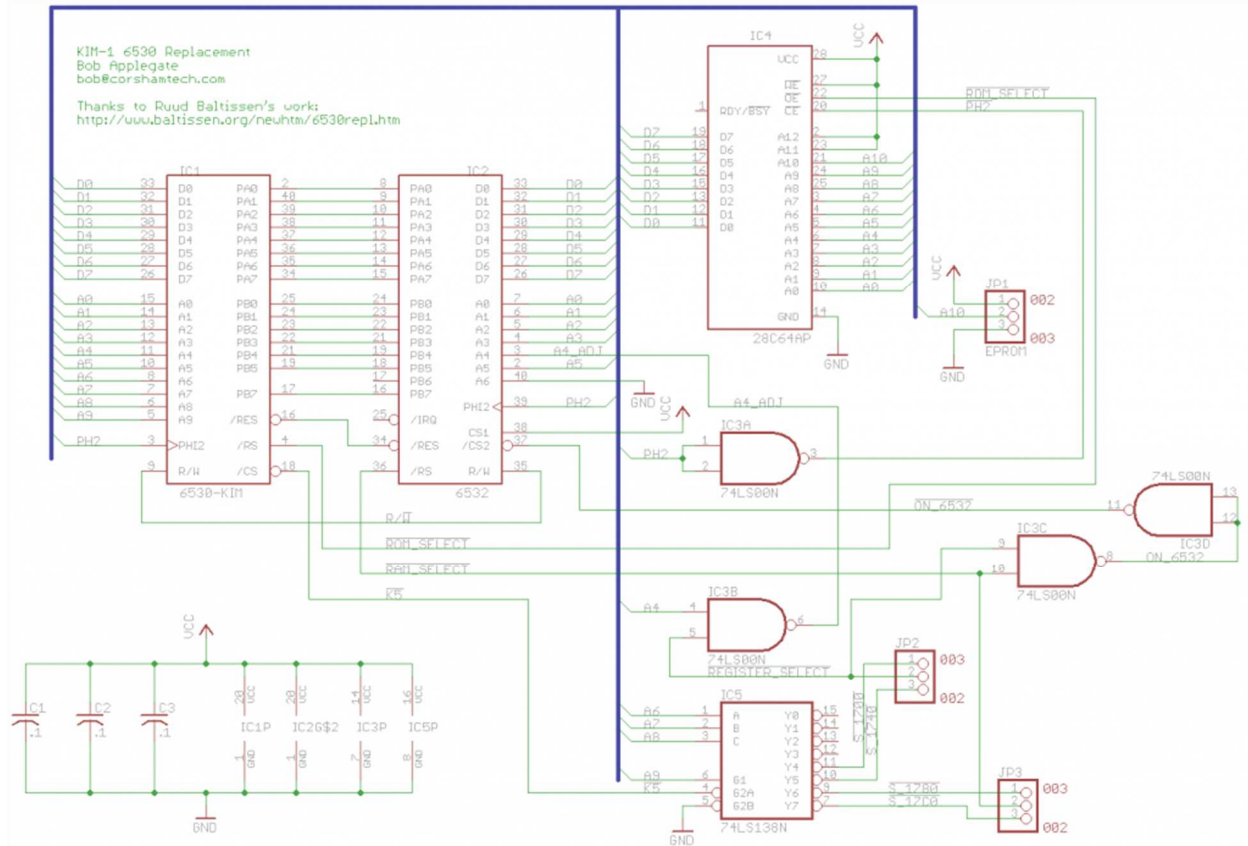
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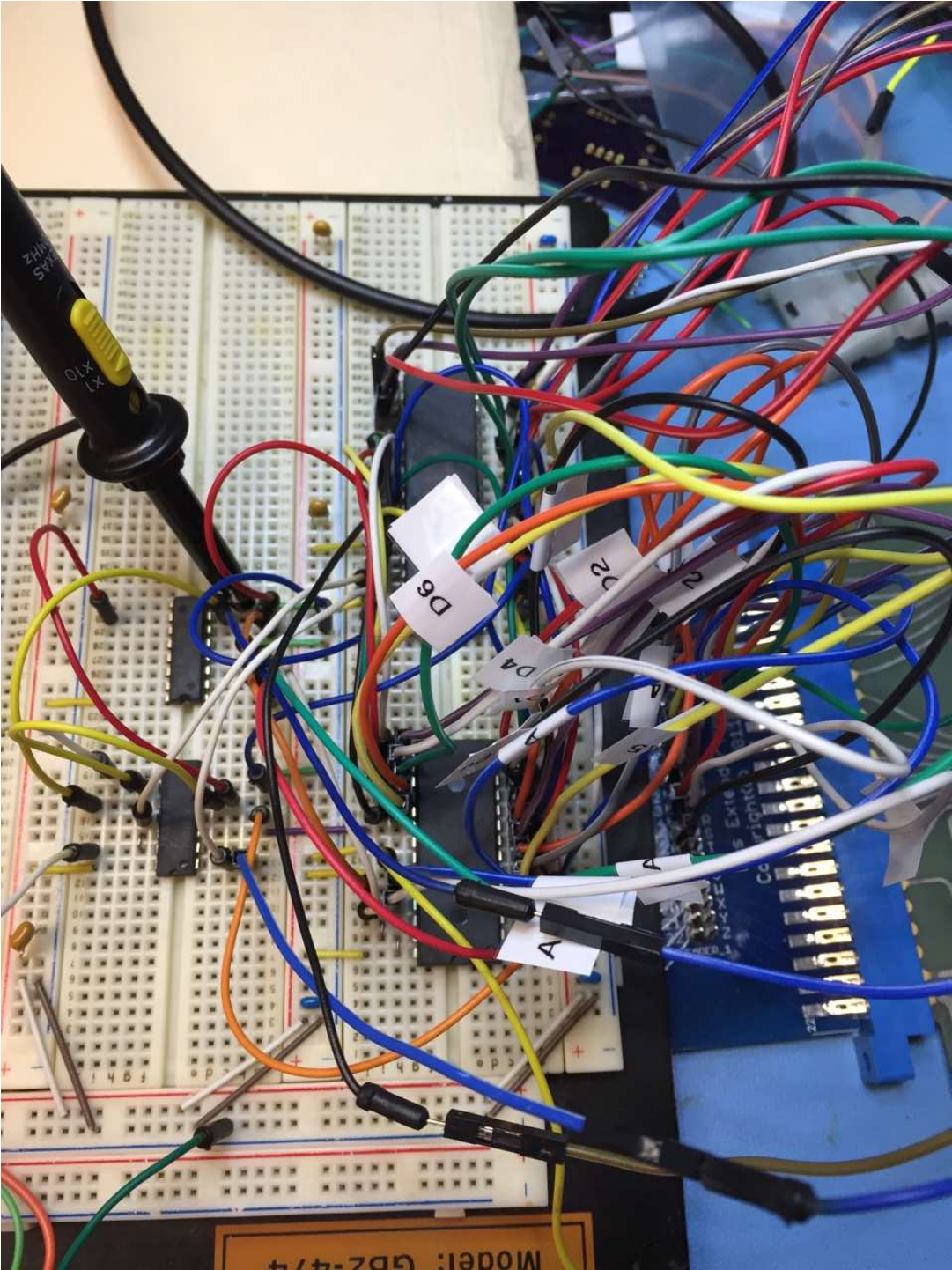
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For those who think schematic diagrams are complicated, just wire it exactly like I did:

Need a slightly closer view?

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.

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 002 and 003. The intent was to be able to replace either of the two 6530s on the KIM but I've replaced only a 002 (U2) device. The 003 settings are untested.
- 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.