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**KIM Clone Assembly Instructions**

# Introduction

Thank you for buying our KIM Clone kit!

It is assumed that whoever is assembling this kit has a decent background in electronics and has assembled other kits successfully. While the technology on this project might be low-tech by today’s standards, there are over a hundred parts and many hundreds of solder connections to perform. If there are errors then something probably won’t work right, and it’s also possible components can be damaged.

This will probably require several evenings to assemble. The construction is broken down into sub-assemblies which can often be tested before moving on to the next section. However, do to the limited amount of code space available in the EEPROMs there are few diagnostics to help test/debug some sections.

Work Environment

You’ll find a well-lit work area with plenty of room to spread out the parts and have our tools will be a benefit.

Tools Needed

Soldering pencil, in the 25 watt range, preferably with a clean, pointed tip.

Solder. We prefer one with a water soluable flux such as XXXXXXXX.

Tip cleaner to keep the soldering tip clean.

Wire cutters to cut off leads of components after soldering.

Volt/Ohm meter (VOM).

Optional Tools

Oscilloscope. These are low frequency signals, so even a “slow” 20 MHz scope is more than fast enough.

Frequency counter. Check your VOM, as many include a frequency counter.

# USB Interface

The USB interface is partially built, as we solder the interface chip (IC4) and the USB B connector and test them both.

[ ] - Install two .1uf caps at C4 and C16. Solder, then cut each lead.

[ ] - Install two 220 ohm resistors at R37 and R38. Solder, then cut each lead.

[ ] - Install LED8 and LED9. These need to be inserted properly, with the long leads being closer to IC4. Solder, then cut each lead.

# Power Supply

The next easiest to build and test subassembly is the 5 volt DC power supply. Most of this is done in the lower left corner of the board but you will be installing filter capacitors over most of the board.

[ ] - Install J1 and solder the three pins. This connector can only be inserted one way.

[ ] - Install diode D1 and solder the two pins. The diode must be installed the proper way: the white band on the diode should align with the white band on the circuit board. The diode can be damaged by heat, so once the solder melts, remove the iron from the lead.

[ ] - Install diode D2 and solder the two pins. The diode must be installed the proper way: the white band on the diode should align with the white band on the circuit board.

<<insert photo of diode>>

[ ] – Install capacitor C1 (electrolytic) and make sure it’s installed properly. On the PC board one lead is labeled “+” while on the capacitor there is a white band indicating the negative lead. Make sure the lead nearest to the white band is not in the “+” hole.

<<insert photo of capacitor>>

[ ] – Install Cxxx and Cxxx (the 1 uf discs). Solder, then cut leads.

[ ] – Install Cxxx, Cxxx (all the .1 uf discs). Install a few at a time, solder, cut the leads and then install some more.

[ ] – Install S1 power switch. Solder.

[ ] – Bend the leads on voltage regulator VR1 and install, solder.

[ ] – Install a 1K ohm resistor at R1. Solder, cut leads.

[ ] – Install LED1 with the long lead being on the right (closer to R1).

[ ] – Plug in power supply, connect to power jack. Turn on Power switch and verify LED1 is on.

# CPU Support

556 and parts, reset switch, 6502 socket, pull-ups, 14 an 16 pin sockets, oscillator.

# More Support

This is the fun stage, as your KIM Clone’s TTY interface should be functional when this section is done. However, there are still a lot of parts to install in this section.

RAM socket, two EPROM sockets, 6532 sockets, DIP switches and jumpers.

How to set up DIP switches and jumpers, install chips, apply power and have the TTY interface working.

# LEDs

Resistors, transistors, LEDs

# Keyboard

Misc

SD header

*Bob Applegate*

*August 2017*

# Revision History

|  |  |
| --- | --- |
| Version | Changes |
| 1 | Initial version. Was missing pull-up resistor. |
| 2 | Added the missing pull-up R5. |

# Errata

None.

# Parts List

|  |  |  |
| --- | --- | --- |
| Part | Number | Description |
| PCB | 1 | Printed Circuit Board (Corsham Tech) |
| P1 | 1 | 22/44 pin .156” edge connector |
| JP1 | 1 | 2x5 shrouded jumper block |
| R1-R5 | 5 | 2.2K ohm |
| C1-C4 | 4 | .1uf disc capacitor, .1” lead spacing |
| SW1 | 1 | 8 position DIP switch |
| SW2 | 1 | 1 position DIP switch |
| IC1 | 1 | 628128 8x128K static RAM |
| IC2 | 1 | 74LS133 |
| IC3 | 1 | 74LS145 |
| IC4 | 1 | 74LS04 |
| IC5 | 1 | 27C64 EPROM (optional) |
|  | 1 | 32 pin IC socket for IC1 |
|  | 2 | 16 pin IC sockets for IC2 and IC3 |
|  | 2 | 14 pin IC sockets for IC4 and IC6 |
|  | 1 | 28 pin IC socket for IC5 |