Ben Eater’s 8 Bit Computer Thomas Ware 300195783

Guide to Getting Started

**Step 1:** Read documentation that came with your Kit.

**Step 2:** There is definitely some assembly required.

When the system is assembled some assembly language is required to run the EEPROMS that are in the System. Luckily We only have to load the C Program Sketches for Ben Eaters GitHub Repository.

**Step 3:** Program the EEPROM that handles the OUTPUT Display Logic.

**Step 4:** Program the EEPROMS that are handling the Control Logic.

IF you have not been testing each module as you were going through the Assembly Process this will be the first time to power up the system. The kit has a power adapter that will safely power the system. However before connecting it make sure that all connections to VCC and Ground are correct so that no LED or IC gets Damaged.

Now you are ready to make your first Computation with you 8-bit computer. There is not very much that you can compute with this learning tool. There are only ADDITION and SUBTRACTION operations with the ALU. There is also a limit to the values that can be summed or subtracted. One mode let you input value 255 the other mode lets you see the 2’s complement -127 to 128. Remember that they are 8 bit Binary values.

**Step 5:** Set the clock into the manual stepping mode.

**Step 6:** Make sure that you toggle the red LED to Program Mode.

**Step 7:** Now enter a value in the Memory Address Register. This can be a 4 bit binary value of 0000 to 1111 by way of the 4 pin Dip Switch. The value should appear on the 4 yellow indicator LEDs

**Step 8:** Next enter a 8 bit binary value of 0000000 to 11111111 using th 8 pin Dip Switch. Then press the push button next to that Dip Switch. You should then see this output to the Red indicator LEDS.

Congratulations you have entered your value into RAM.

Fallow Ben Eater @ [beneater.net](http://beneater.net) he will guide you through the means by which you can manually enter a program, This uses a LDA instruction that loads from Memory Address 1111 Value=00001110 into Register A. Then a ADD instruction to put the contents of Address 1110 Value=00011100 which gets summed by the ALU to the magic number of… = the OUTPUT Display value.

Place the MAR Module into RUN mode and set the Clock into manual step mode. If the EEProms are correctly programmed and the circuits are error free you should see the values lighting the appropriate lights and at the end 42 should appear on the seven segment displays.

For those that run into problems that can result from such a complex undertaking you are ready to do some TroubleShooting.

Good Luck.

See areas of Documentation on [Testing and TroubleShooting](https://docs.google.com/document/d/1vmq7wRuSBb5o9paZzQmg31bXrIWW1kR6TaFBU_WAW8A/edit?usp=sharing).