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Assembling Infinity Shred's, "Datadealer," synthesizer

Created by Damon Hardjowirogo



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Overview



Datadealer is a functionally identical clone of the Mutable Instruments Shruthi-1 - a hybrid analog / digital mono-synth that's as powerful as it is versatile. This thoughtfully curated kit includes all of the components needed to assemble a functioning synthesizer, a lasercut matte black case with iridescent top plate, a set of black Chroma Caps with a glow in the dark encoder cap, and chips pre-loaded with sounds designed and used by Infinity Shred in creating Long Distance.

The design of this board uses only through-hole components which makes assembly a breeze but intermediate soldering experience is highly recommended due to the high volume of parts. Datadealer features a built in sequencer but external control via MIDI is recommended for the best experience.

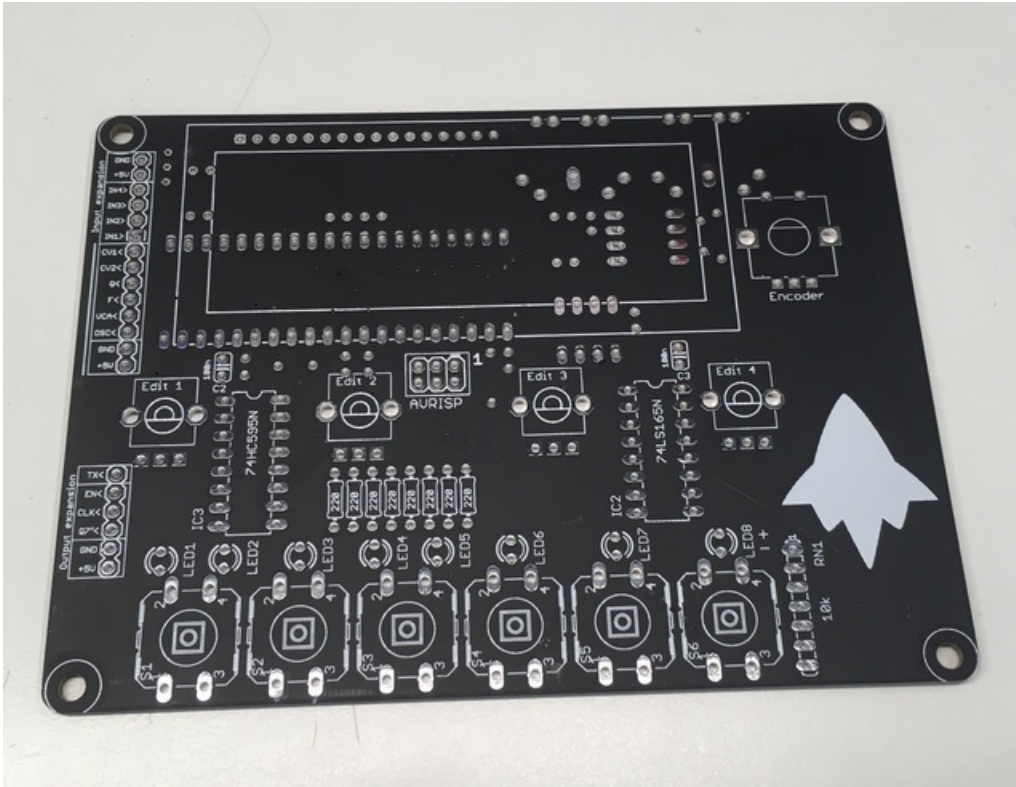
Though this synth is functionally identical to the Shruthi-1, Mutable Instruments no longer offers support or troubleshooting assistance for this item. To honor their decision to move away from this product we urge you to take extra care when following assembly instructions and direct all support requests directly to Infinity Shred via band@infinityshred.com

Datadealer is released under a cc-by-sa license that allows anyone with the files to reproduce the synth themselves as long as the same license is upheld. Files are available for download here --
> <https://github.com/infinityshred/Datadealer>

Now let's get soldering!

Assembling the Digital Control Board

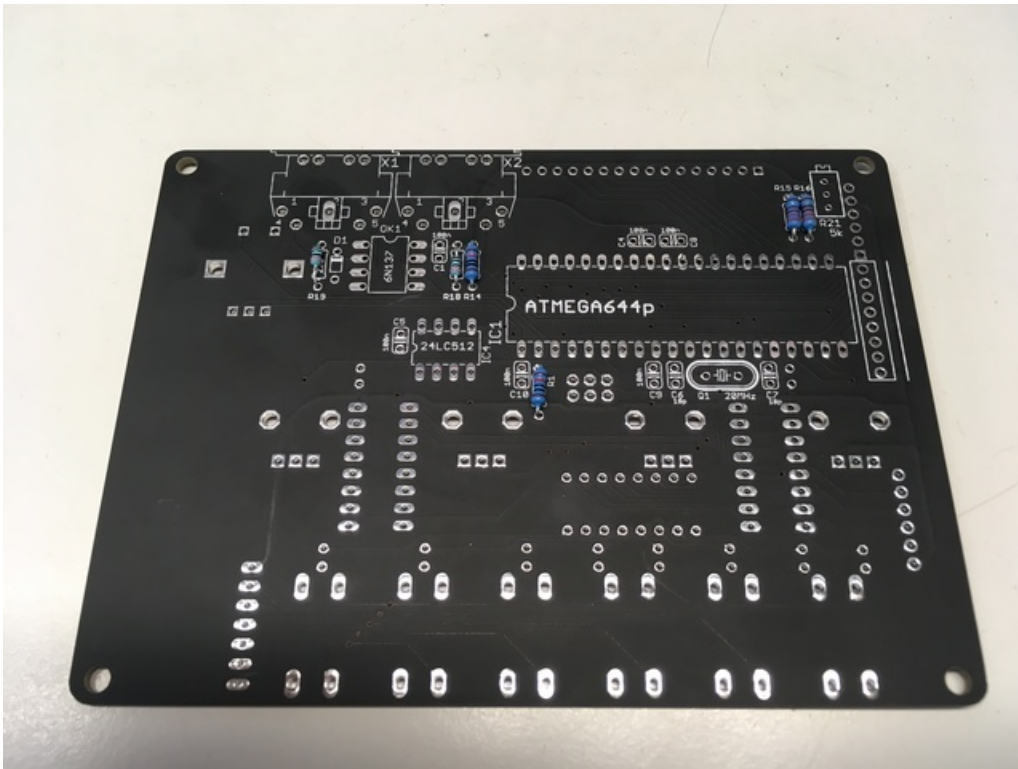
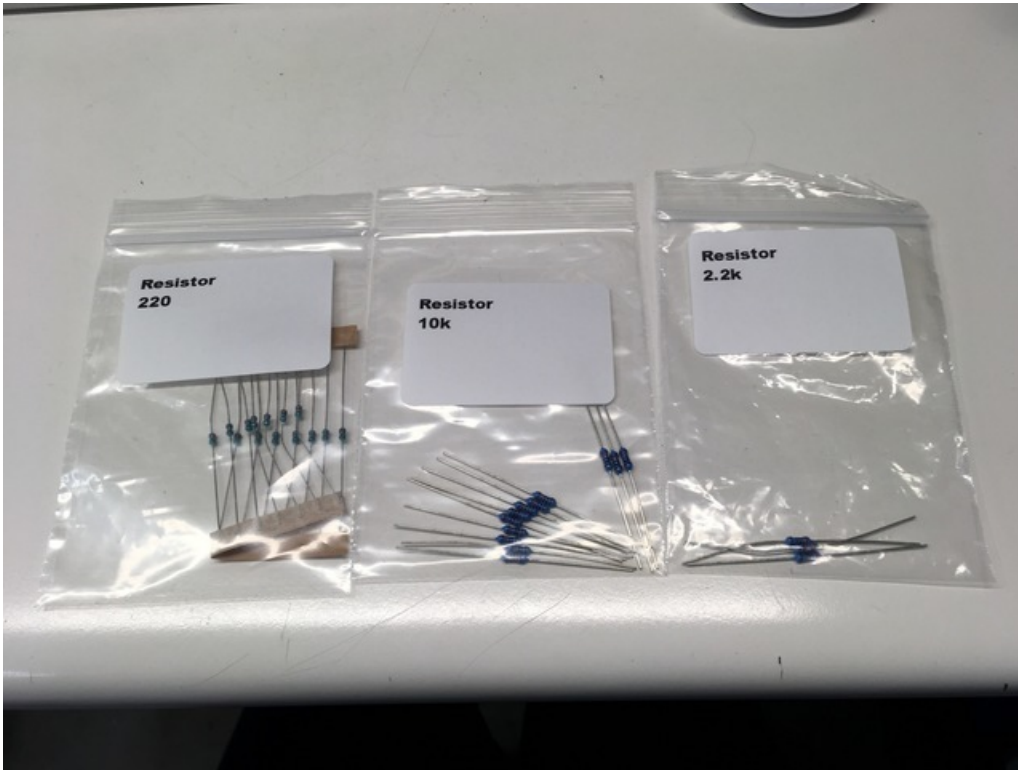
Let's start by soldering the component's on the bottom of the Digital Control board. The top of this board can be identified by the Infinity Shred spaceship logo on the right side.



Step one

Let's start by placing the resistors needed on the bottom side of the digital control board. For this step you will need the following resistors...

- Resistor 220 for R18 and R19
- Resistor 10k for R1 and R14
- Resistor 2.2K for R15 and R16

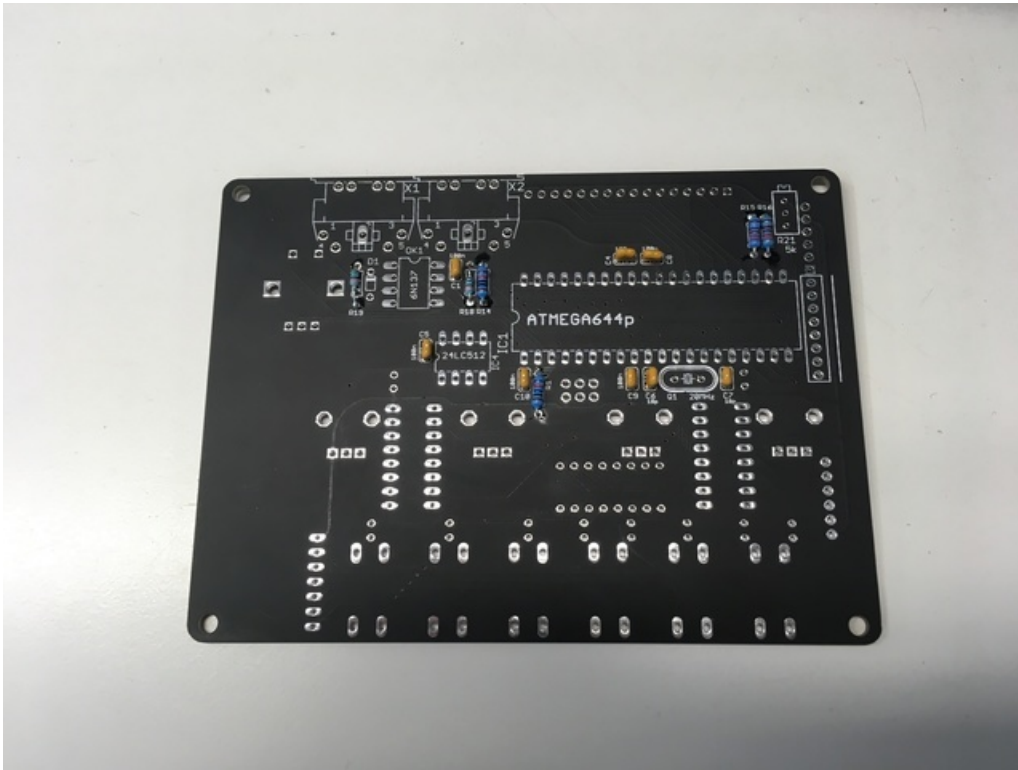


Step two

Now let's place the capacitors for the same side of the board. You will need the following...

- Ceramic Capacitor 18p for C6 and C7

•Ceramic Capacitor 100n C1, C4, C5, C8, C9 and C10

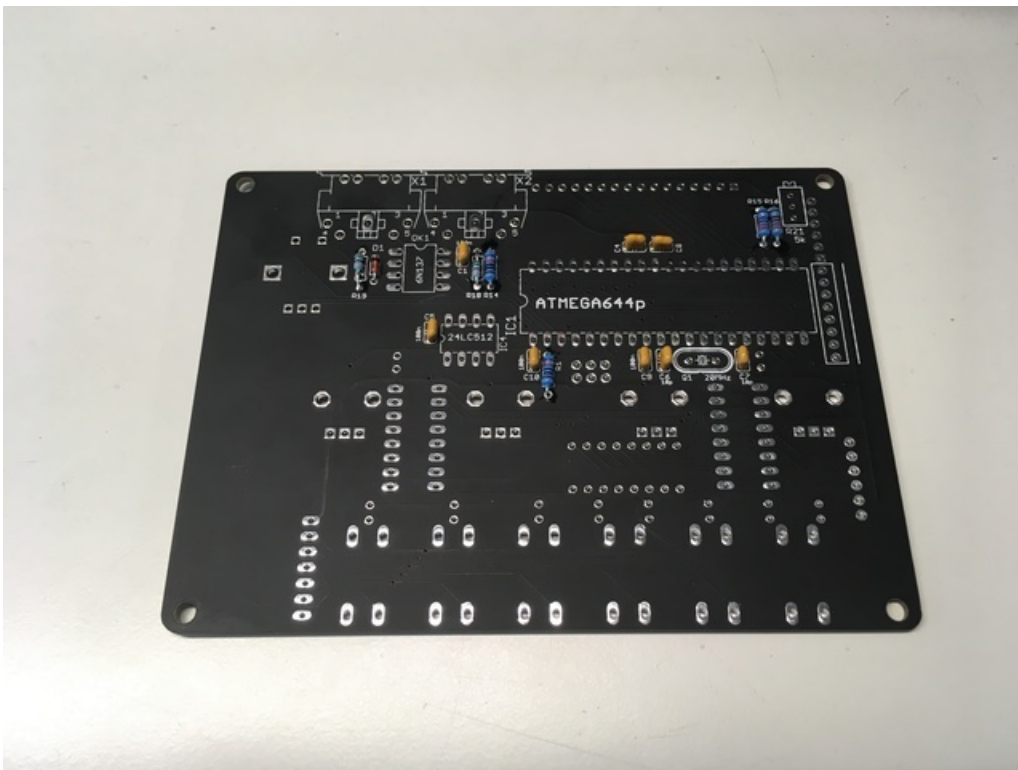


Step three

Let's place the appropriate Diode on D1. Please note Diodes are **polarized** so be mindful of the direction you place it.

The black ring of the diode should point towards the MIDI connectors. For this step you will need...

- Diode 1N 4148

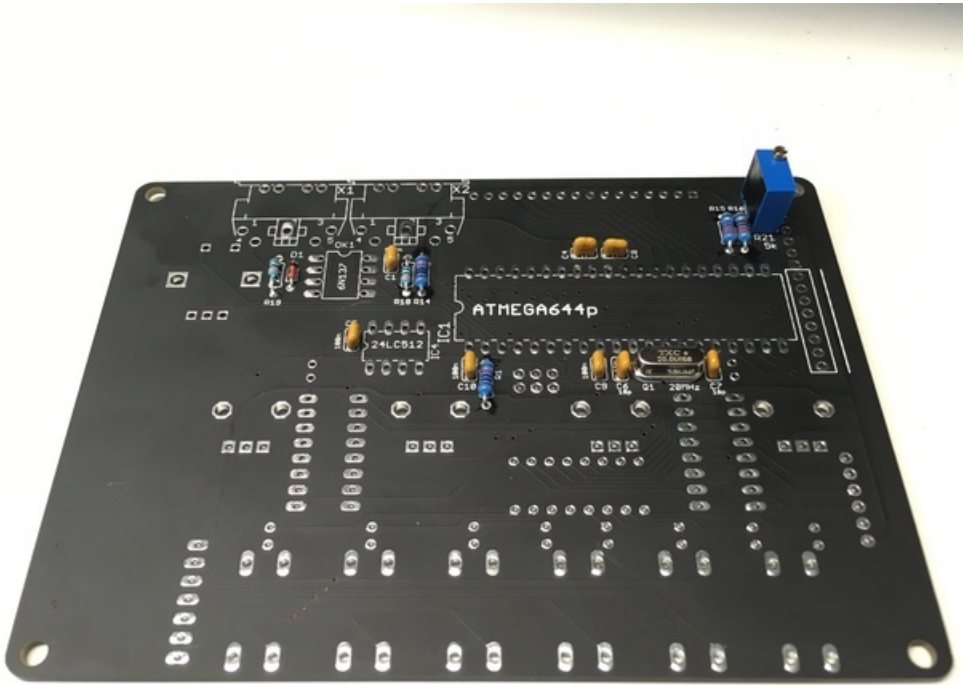


Step four

Let's place the 5K Trim Pot and the 20Mhz Quartz Crystal. Place the trim pot with the screw facing outwards to make it easier to access. For this step you will need...

- Trim Pot 5K for R21
- Quartz 20Mhz for Q1



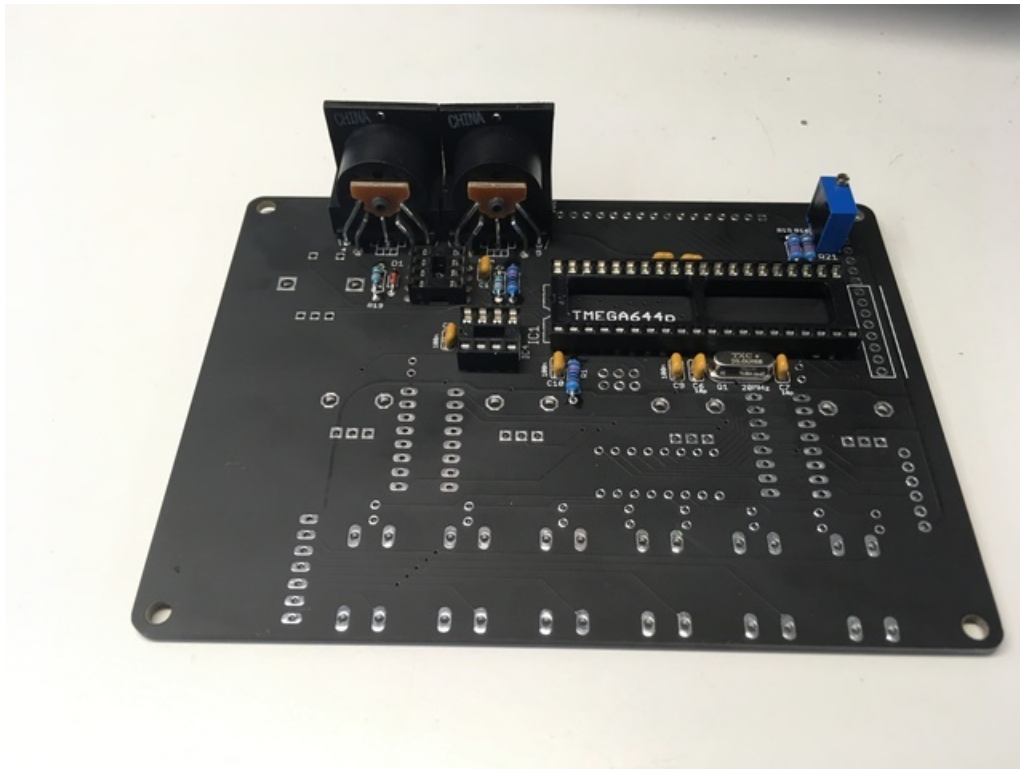
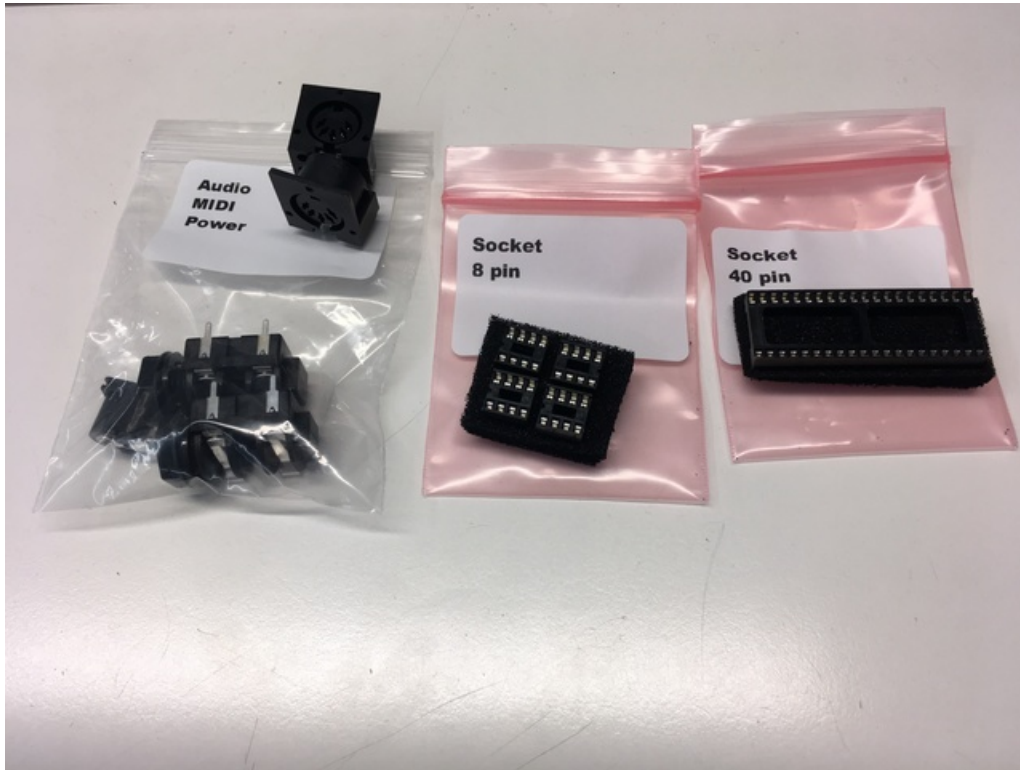


Step five

Now place the 40 pin socket, two 8 pin sockets, and the MIDI connectors. Make sure that the notch on the sockets matches the screen print on the board. For this step you will need...

- Socket 40 pin for IC1
- Socket 8 pin for IC4 and OK1
- MIDI Connectors from bag labeled “Audio, MIDI, Power” for J2 and J3

Later on we will be placing components on the other side of this board. While you should trim all of your leads throughout this project, it is particularly important to carefully trim all leads from this step as much as possible to allow room for the parts that will later sit on top of this area.



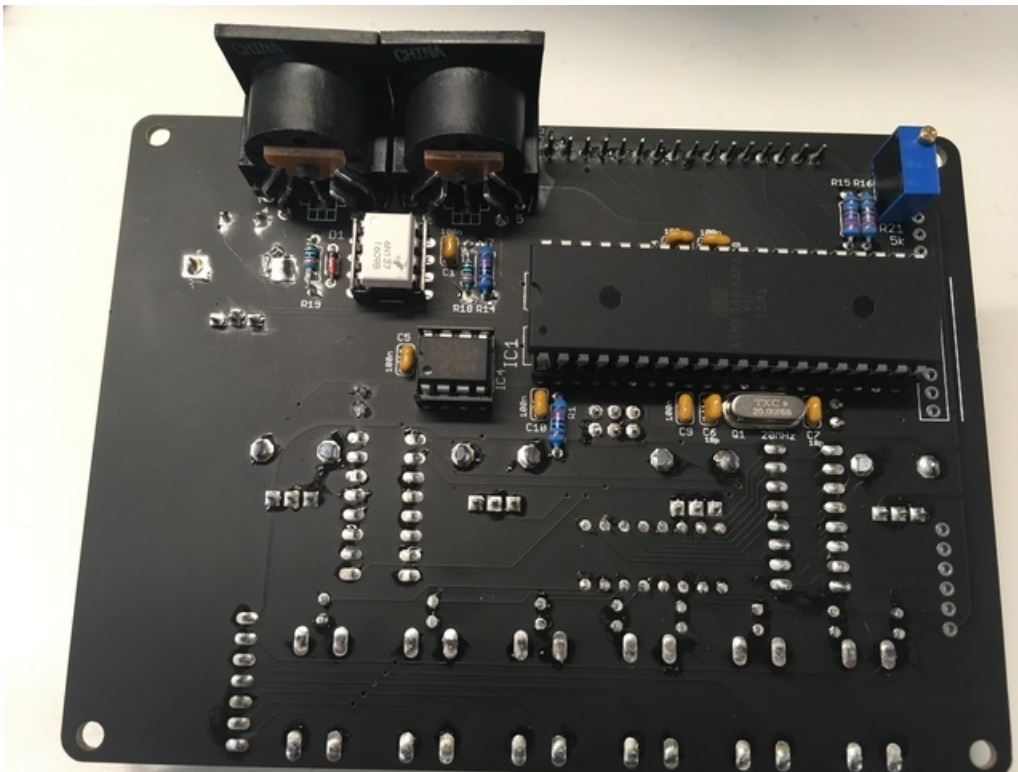
Step five pt 2

Let's slot the ICs for this side of the board. Make sure the notches on the chips are aligned with the notches on the sockets (which should be aligned with the silk screen on the PCB!) For this step you will need...

- IC 6N137 for OK1

•IC ATMEGA644 for IC1

•IC 24LC512 for IC4



You're now done placing components on this side of the board.

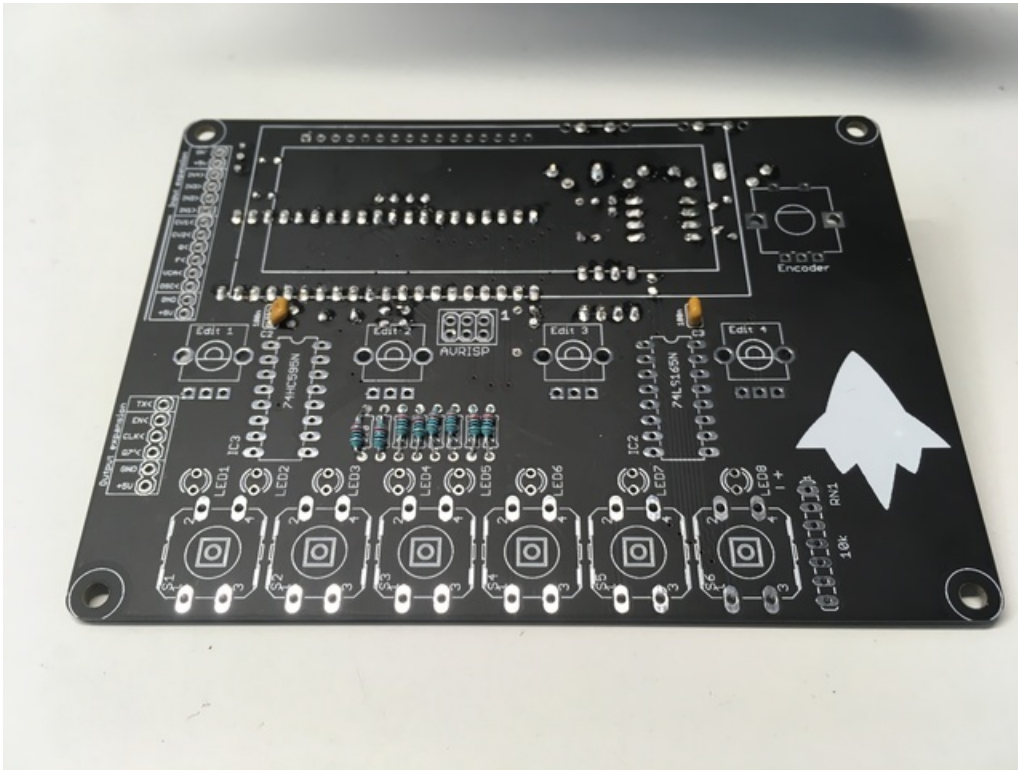
Step six

Flip the board to the top side with the Infinity Shred logo. For this step you will need...

- Resistor 220 for the 8 spaces labeled “220” found below “Edit 2”
- Ceramic Capacitor 100n for C2 and C3

PLEASE NOTE: This kit comes with white LEDs. If you are sensitive to bright lights we suggest replacing the 220 resistors in this step with 1K resistors to dim them OR using red or green LEDs instead of the white when it comes time to place those

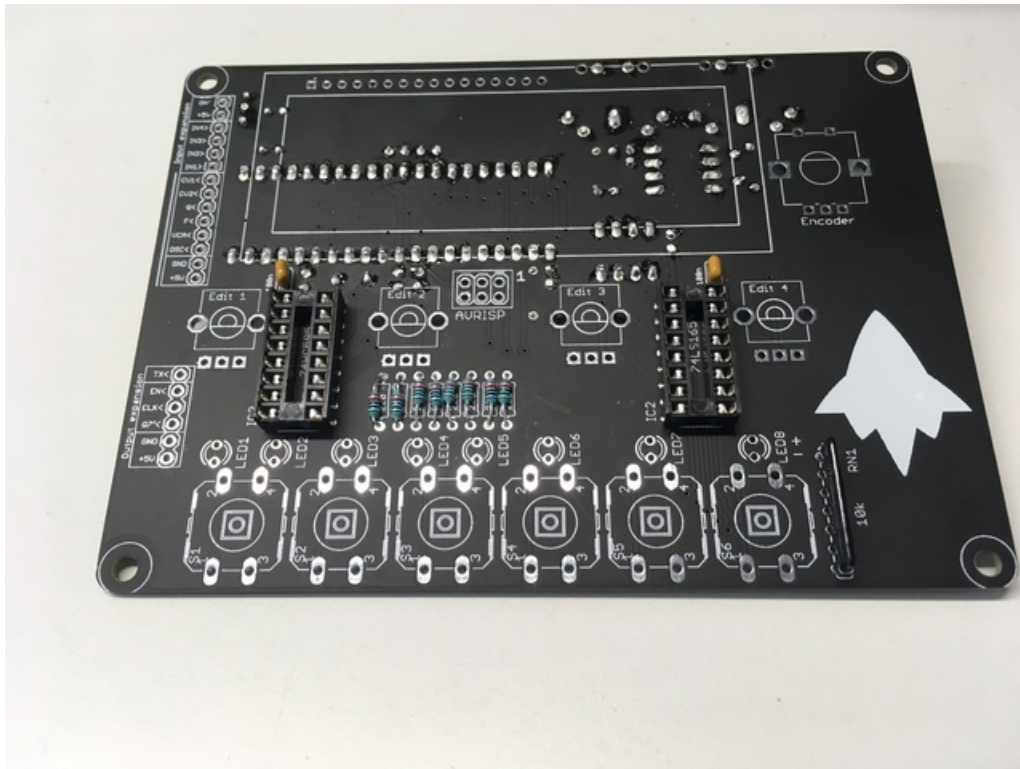
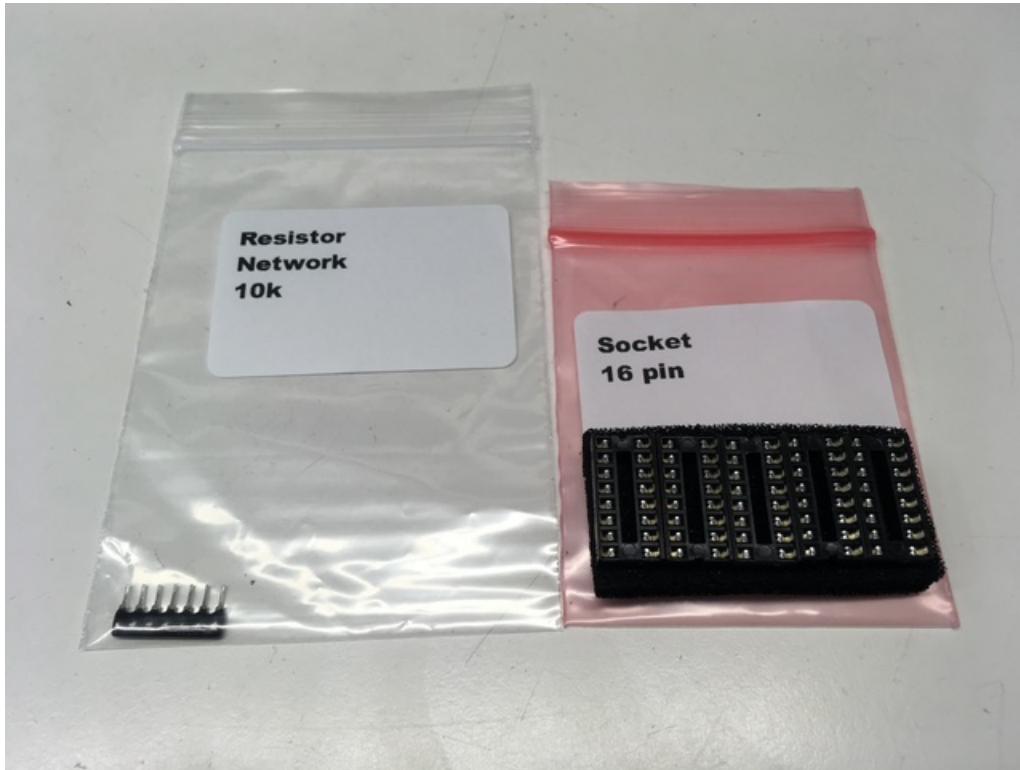


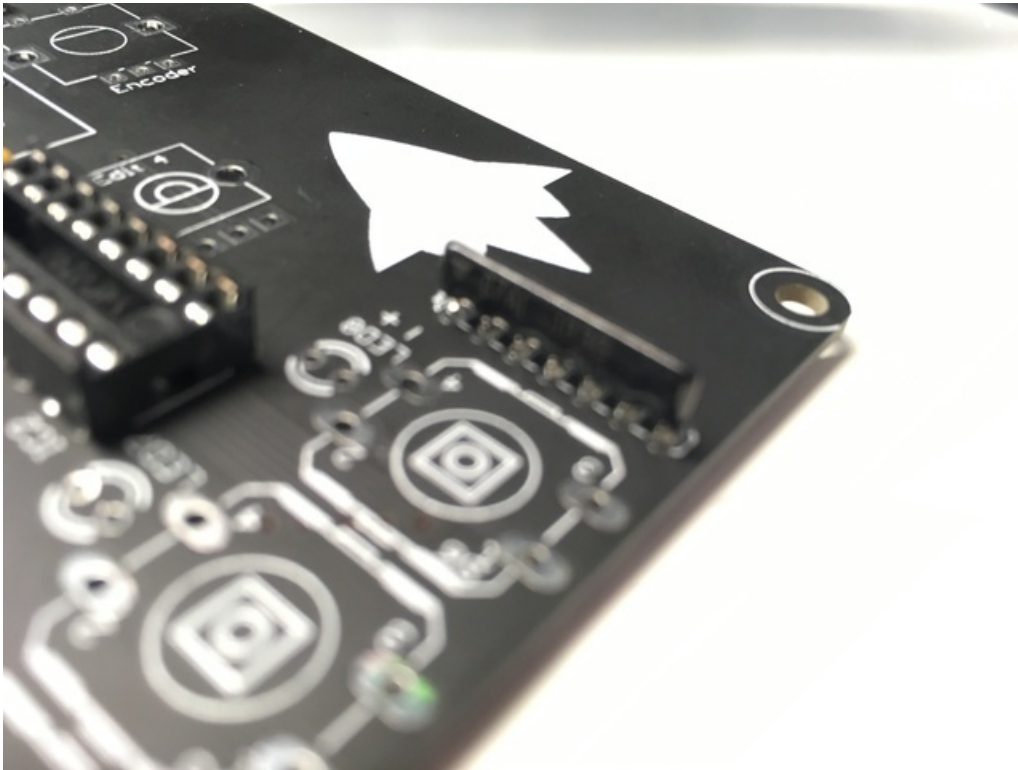


Step seven

We'll now place two more sockets and a resistor array. For the sockets make sure the notches match the screen print. For the resistor network make sure the white arrow is oriented closest to the RN1 text on the board. For this step you will need...

- Resistor Network 10k for RN1
- Socket 16pin for IC2 and IC3

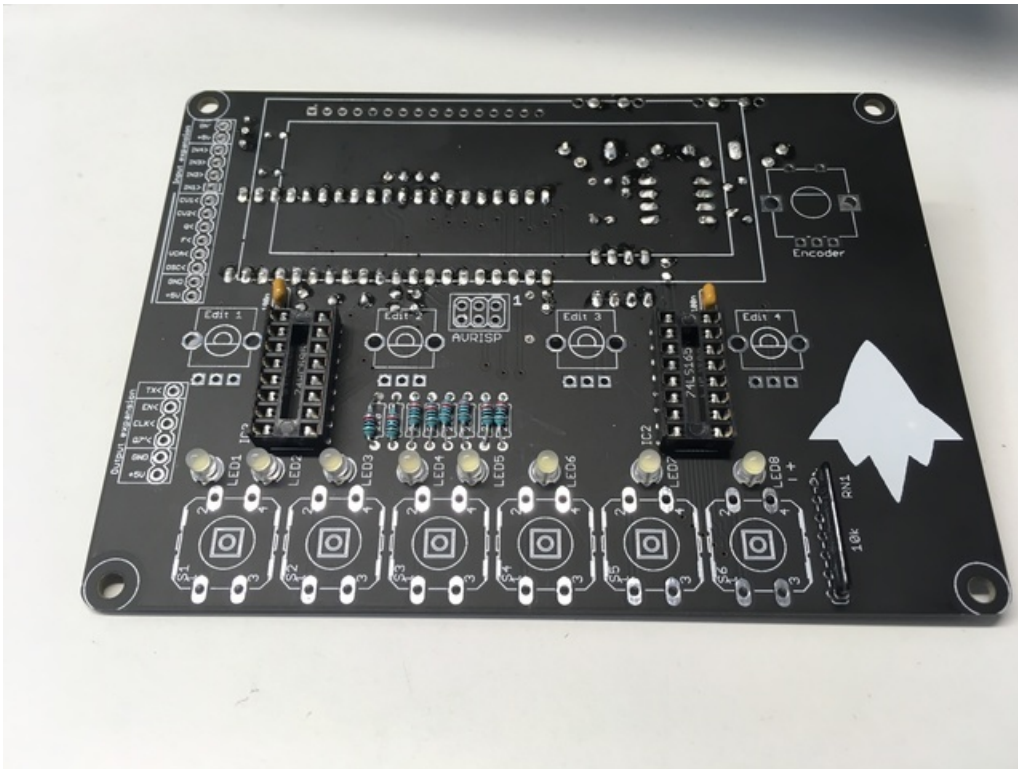




Step eight

LEDs! LEDs are polarized- the short lead is your (-) and your long lead is your (+) Make sure to place all of them according to the markings on the board - the long lead (+) will be facing towards the top of the board. For this step you will need...

- LEDs for LED1, LED2, LED3, LED4, LED5, LED6, LED7 and LED8



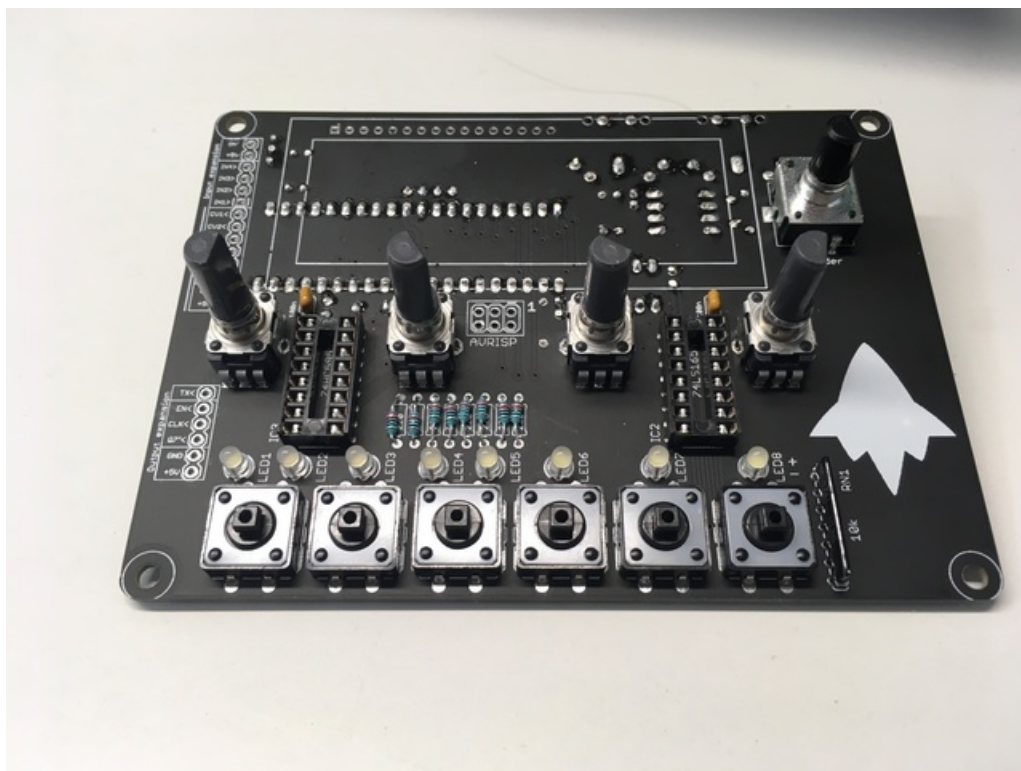
Step nine

Let's add the controls. For this step you will need...

- Pots for Edit 1, Edit 2, Edit 3, Edit 4

•Encoder for Encoder

•Buttons (leave the black plastic rectangles in the bag for now) for S1, S2, S3, S4, S5 and S6



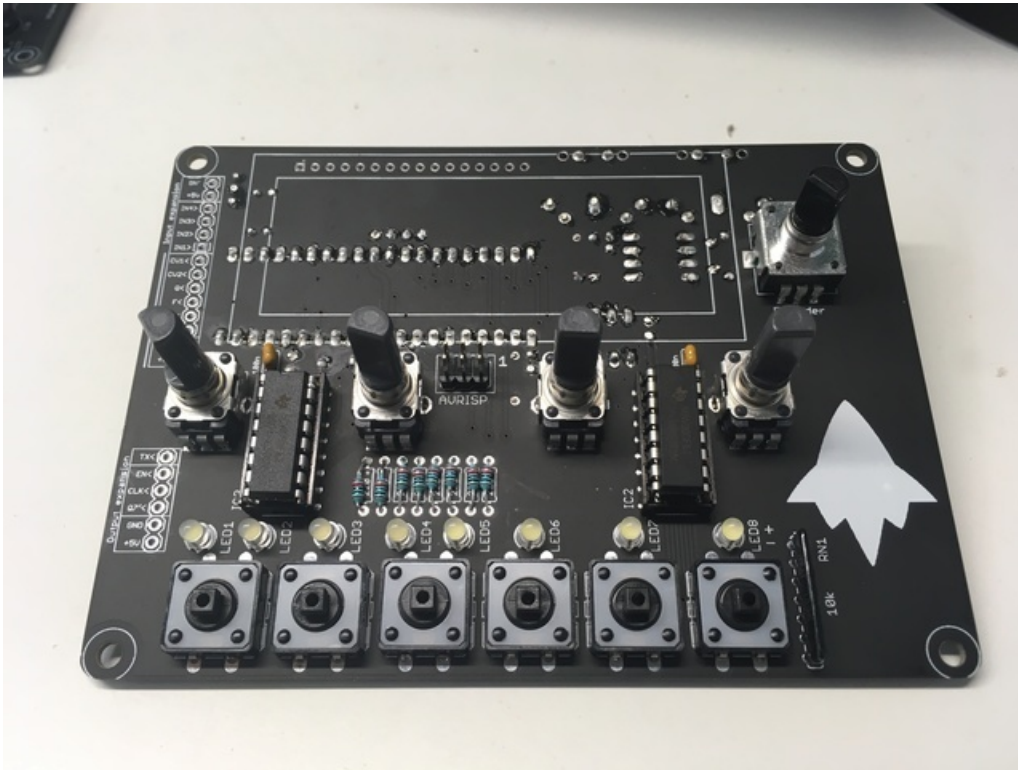
Step ten

Let's slot the ICs for this side of the board. Make sure the notches on the chips are aligned with the notches on the sockets (which should be aligned with the silk screen on the PCB!) For this step you will need...

- IC 74HC595 for IC3

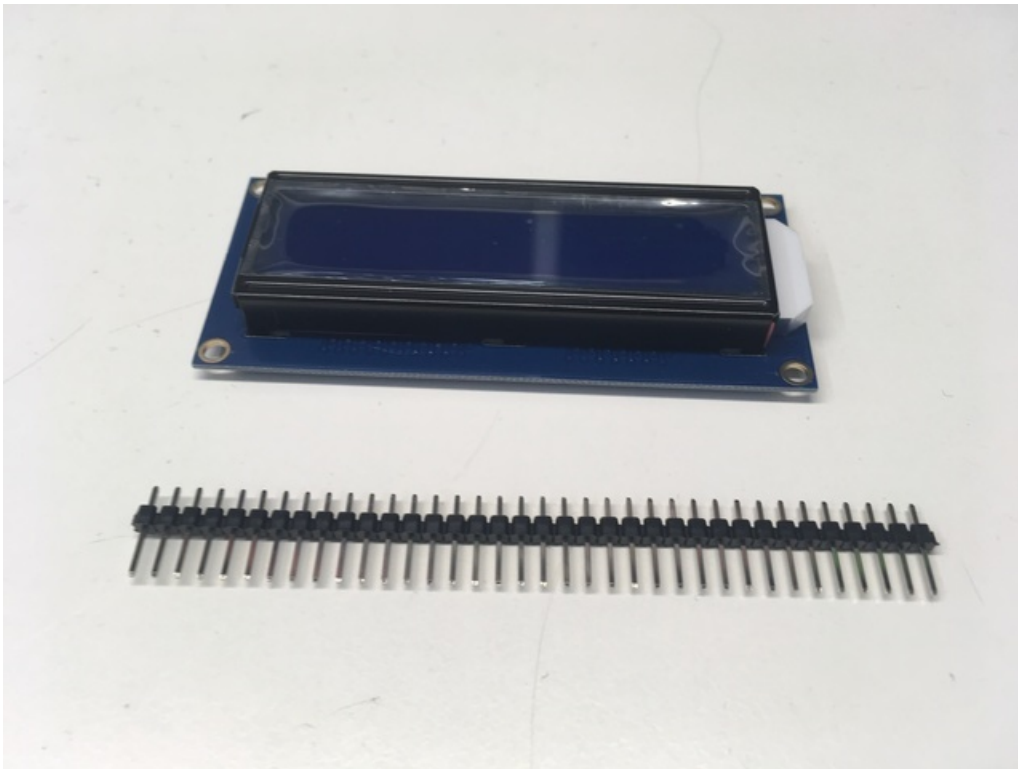
- IC 74LS165 for IC2

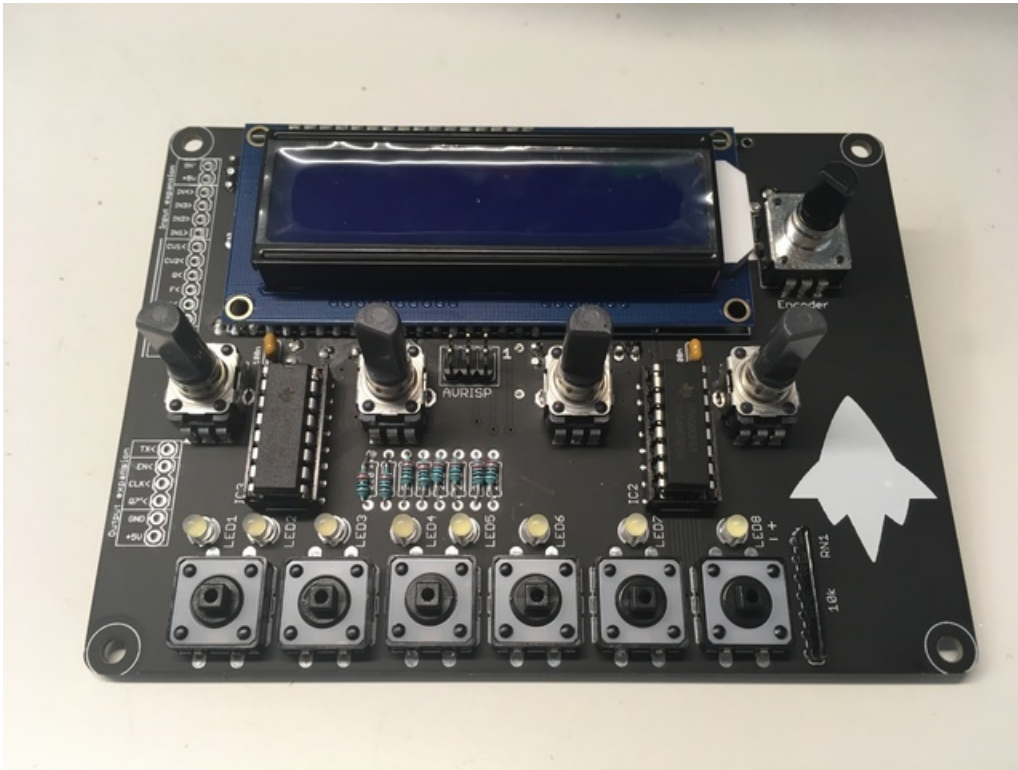




Step eleven

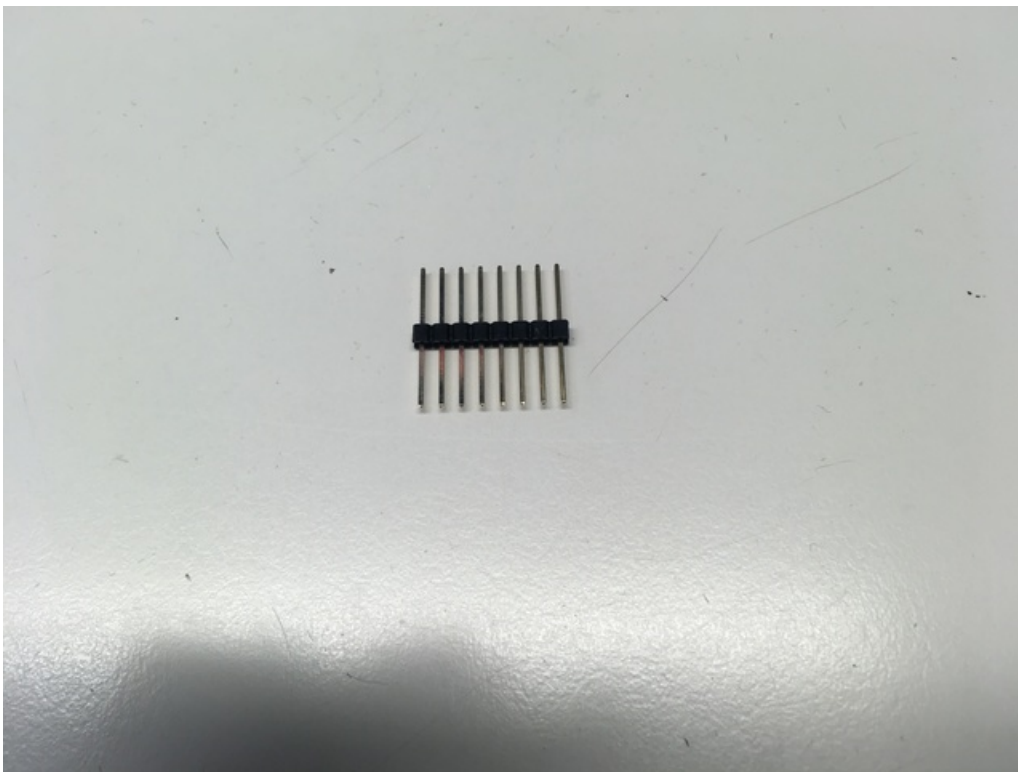
Now that everything else is placed we can solder in our LCD. Begin by soldering the header to the screen, then solder the LCD to the board.

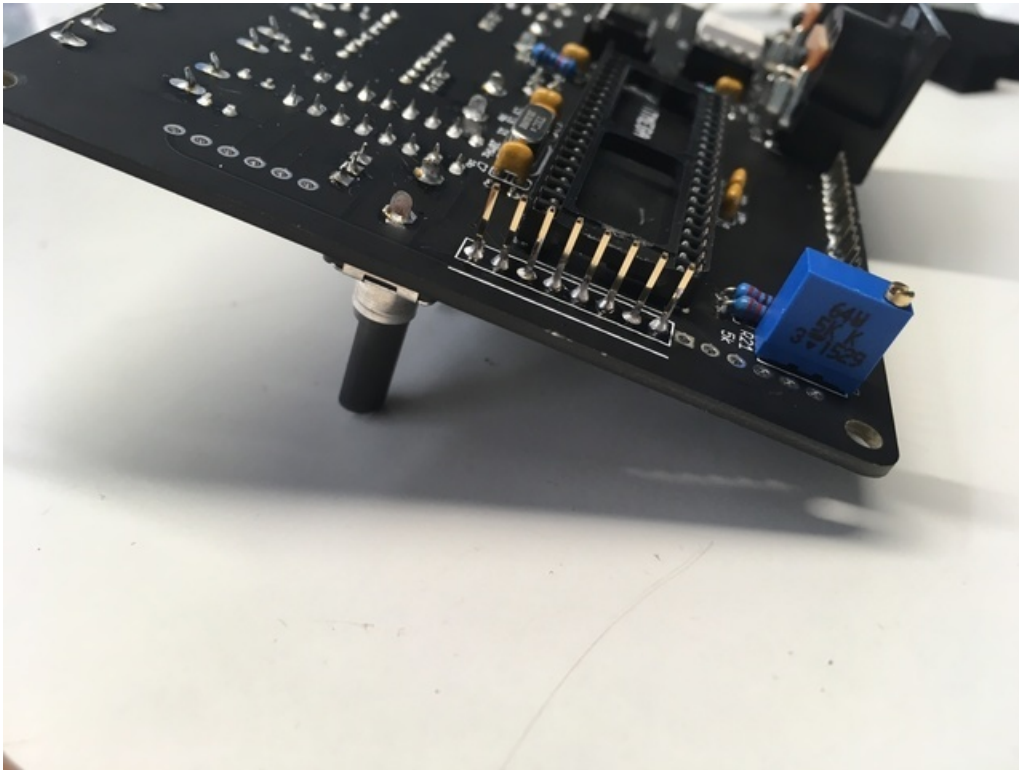




Step twelve

Finally let's add the long 8-pin header from the bag labeled "Headers." Place this header so that the plastic piece is on the top side of the board. When you are done soldering this remember to trim the leaders that stick up on the same side as the screen and pots!





You're now done assembling the Digital Control Board!

Assembling the Analog Filter Board

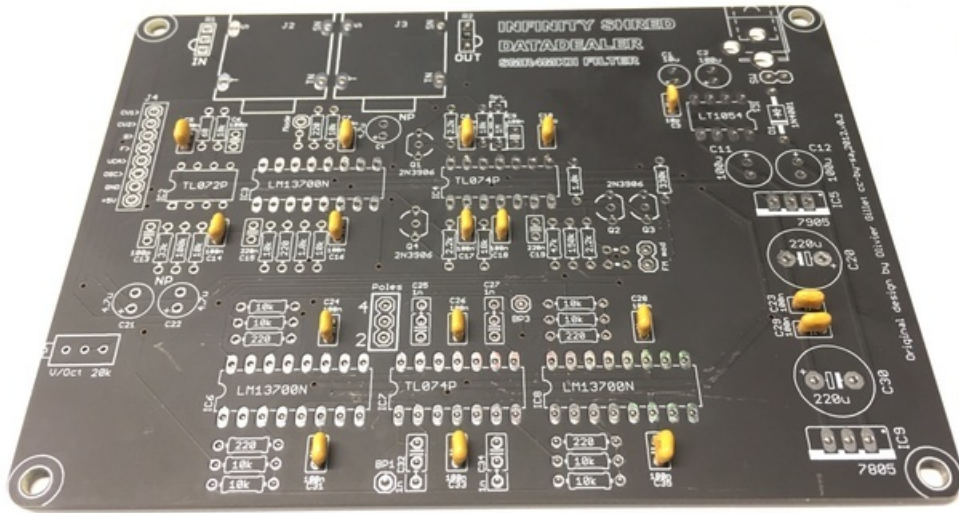
Let's grab our second PCB. For this kit we included the standard SMR4MKII filter board. Unlike the control board this board is single sided. Make sure you are placing all components on the side with the screen prints.

Step one

Let's start by placing some capacitors. For this step you will need...

- Ceramic Capacitors 100n for C5, C7, C8, C9, C14, C16, C17, C18, C23, C24, C26, C28, C29
- Ceramic Capacitors 10p for C3

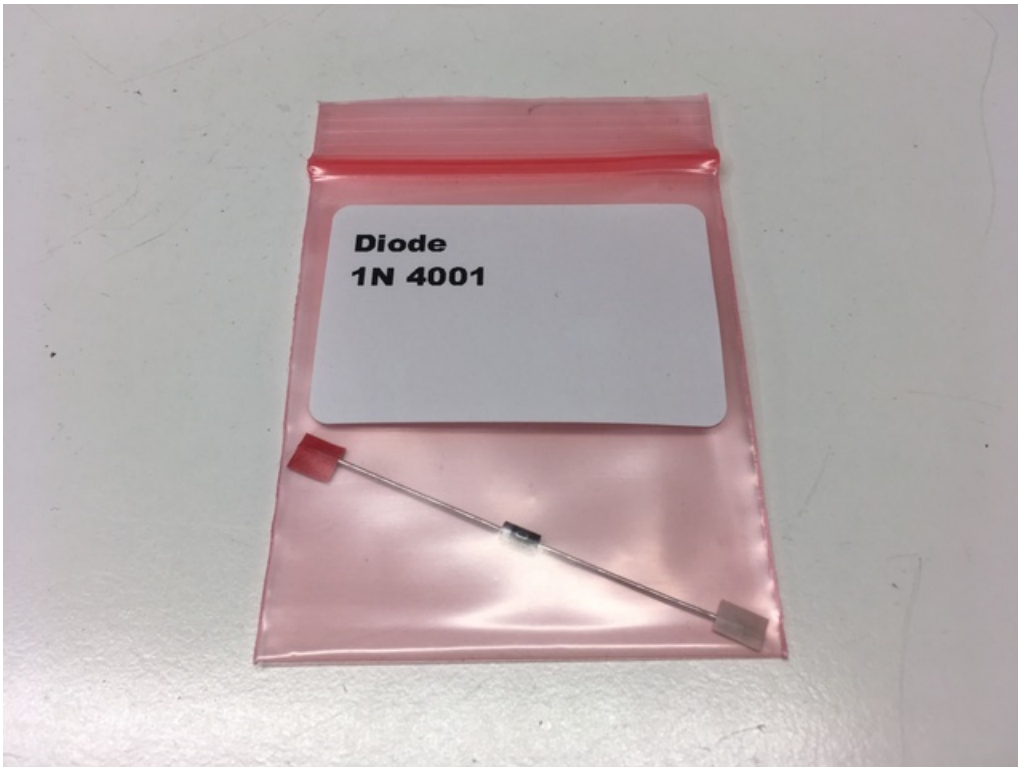


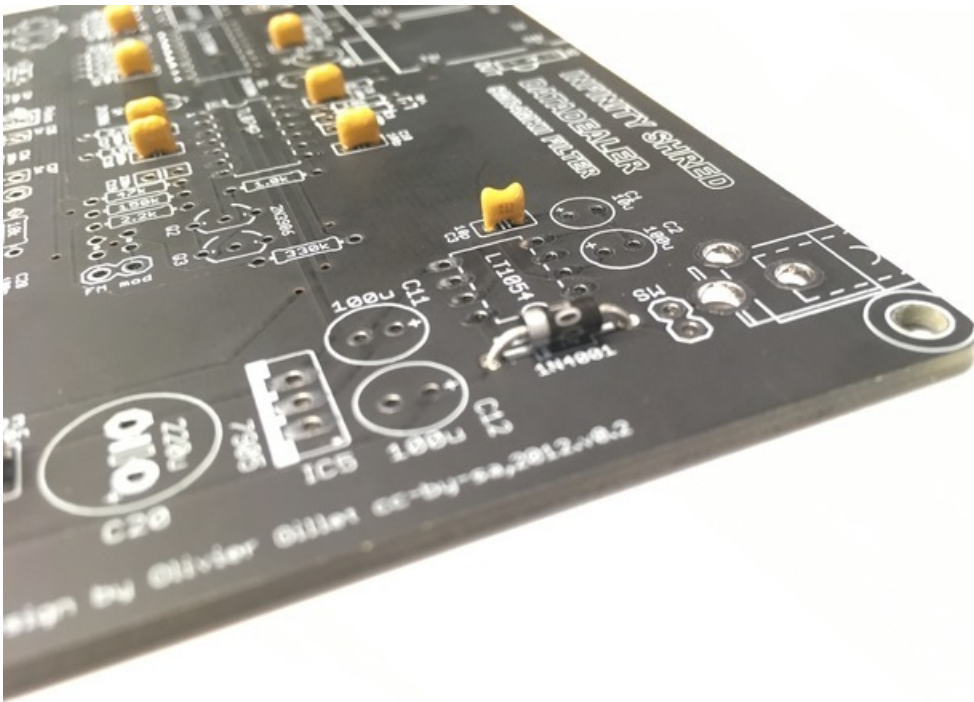


Step two

Let's place the protection diode at D1. This part is polarized! Make sure the stripe matches the markings from on the screen print. For this step you will need...

- Diode 1N 4001

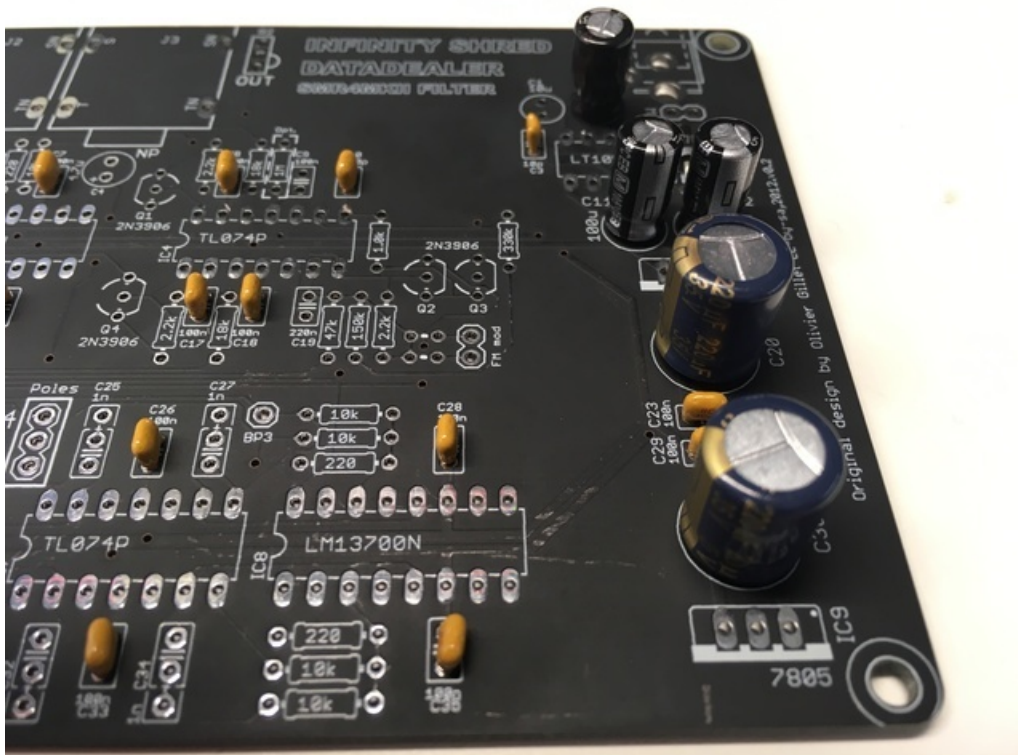




Step three

Let's place some electrolytic capacitors. Please note unlike the ceramic capacitors, these are polarized. Just like with LEDs, your longer lead is your (+) end. For this step you will need...

- Electrolytic Capacitor 220u for C20 and C30
- Electrolytic Capacitor 100u for C2, C11 and C12



Step four

Let's now place the voltage regulators (LM7905 and LM7805) and the DC connector. The voltage regulators have VERY similar part numbers and orientation is important so please be extra careful when placing these. For this step you will need...