



BEAST-TEK
INSTRUMENTS

AMOEBA v1.3

BUILD GUIDE

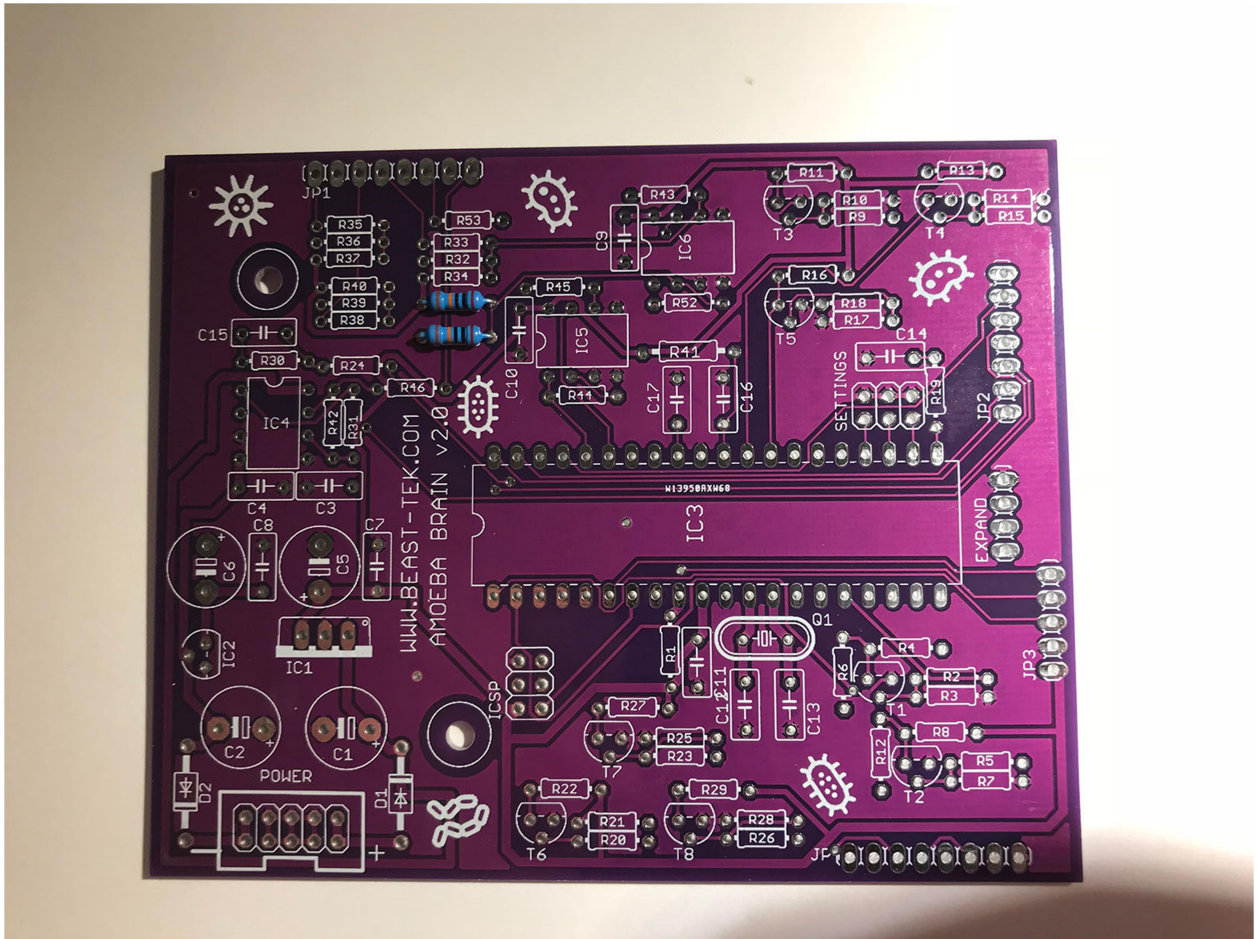
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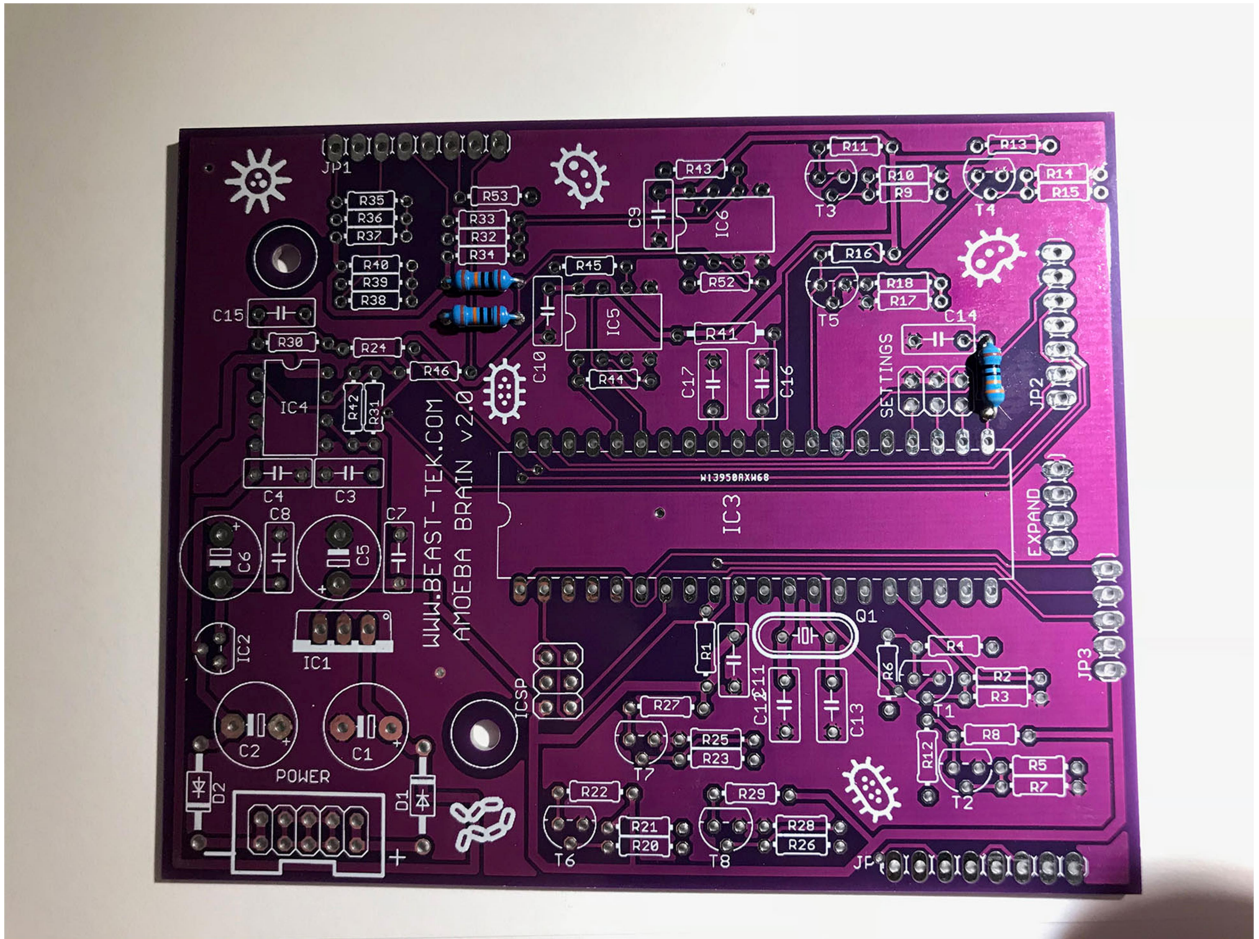
Amoeba Main (CPU) Board BOM			
IC1	7805 5v 1A Voltage Regulator	7805	1
IC2	79L05 -5v 0.1A Voltage Regulator	79L05	1
IC3	ATMEGA1284P-PU		1
IC4	TL072		1
IC5, IC6	MCP602/MCP6022 High precision op-amp		2
D1, D2	IN4004 Power Diode	IN4004	2
T1, T2, T3, T4 , T5, T6, T7, T8	2N3904 Transistor	2N3904	8
C1, C2	100uf Electrolytic LOW ESR Capacitor	100uf	2
C5, C6	22uf Electrolytic LOW ESR Capacitor	22uf	2
C3, C4, C7, C8, C9, C10, C11, C16, C17	100nf Blue Monolithic Capacitor	104	9
C12, C13	22pf Ceramic Capacitor	22	2
C14	220nf MKT Capacitor	224	1
C15	10nf Ceramic Capacitor	103	1
Q1	20mhz Crystal		1
R41	100uH Inductor R.F. Choke		1
R19	330 Ohm Resistor 1%	Orange-Orange-Black-Black-Brown	1
R6, R12, R46, R53	1K Ohm Resistor 1%	Brown-Black-Black-Brown-Brown	4
R1, R4 , R8 , R11, R13, R16, R22, R24, R27, R29 , R30, R31, R42	10K Ohm Resistor 1%	Brown-Black-Black-Red-Brown	1 3
R2, R5, R9, R15, R18, R20, R23, R26, R32, R33, R34, R35, R36, R37, R38, R39, R40, R43, R44, R45, R52	100K Ohm Resistor 1%	Brown-Black-Black-Orange-Brown	2 1
R48, R49	200K Ohm Resistor 1%	Red-Black-Black-Orange-Brown	2
R3, R7, R10, R14, R17, R21, R25, R28	1M Ohm Resistor 1%	Brown-Black-Black-Yellow-Brown	8
JP1, JP4	8 Way Pin Header Single Row FEMALE		2
JP2	7 Way Pin Header Single Row FEMALE		1
JP3	5 Way Pin Header Single Row FEMALE		1
SETTINGS	3 Way pin header dual row MALE		1
EXPAND	5 Way pin header single row MALE		1
ICSP	ICSP - do not populate		
POWER	Shrouded 10pin (2x5) IDC Header (Eurorack Power)		1

Amoeba IO Board BOM			
R5, R6, R7, R8, R9, R10, R11, R12	1K Ohm Resistor 1%	Brown-Brown-Black-Black-Brown	8
R13, R14, R15, R16, R17, R18, R19, R20, R21	1K2 Ohm Resistor 1%		9
C1, C2	100nf Blue Monolithic Capacitor	104	2
IC1, IC2	74HC595		2
LED9	10mm High Brightness White Led		1
LED1-LED8	3mm High Brightness White Led		8
R1, R4, R22, R24	9mm Round shaft 10KB Potentiometer		4
R3, R2, R23	9mm T18 shaft 10KB Potentiometer		3
JP1, JP2	8 Way Pin Header Single Row MALE		2
JP3	7 Way Pin Header Single Row MALE		1
JP4	5 Way Pin Header Single Row MALE		1
	PJ301BM "Erthenvar" 3.5mm Mono Jack		20

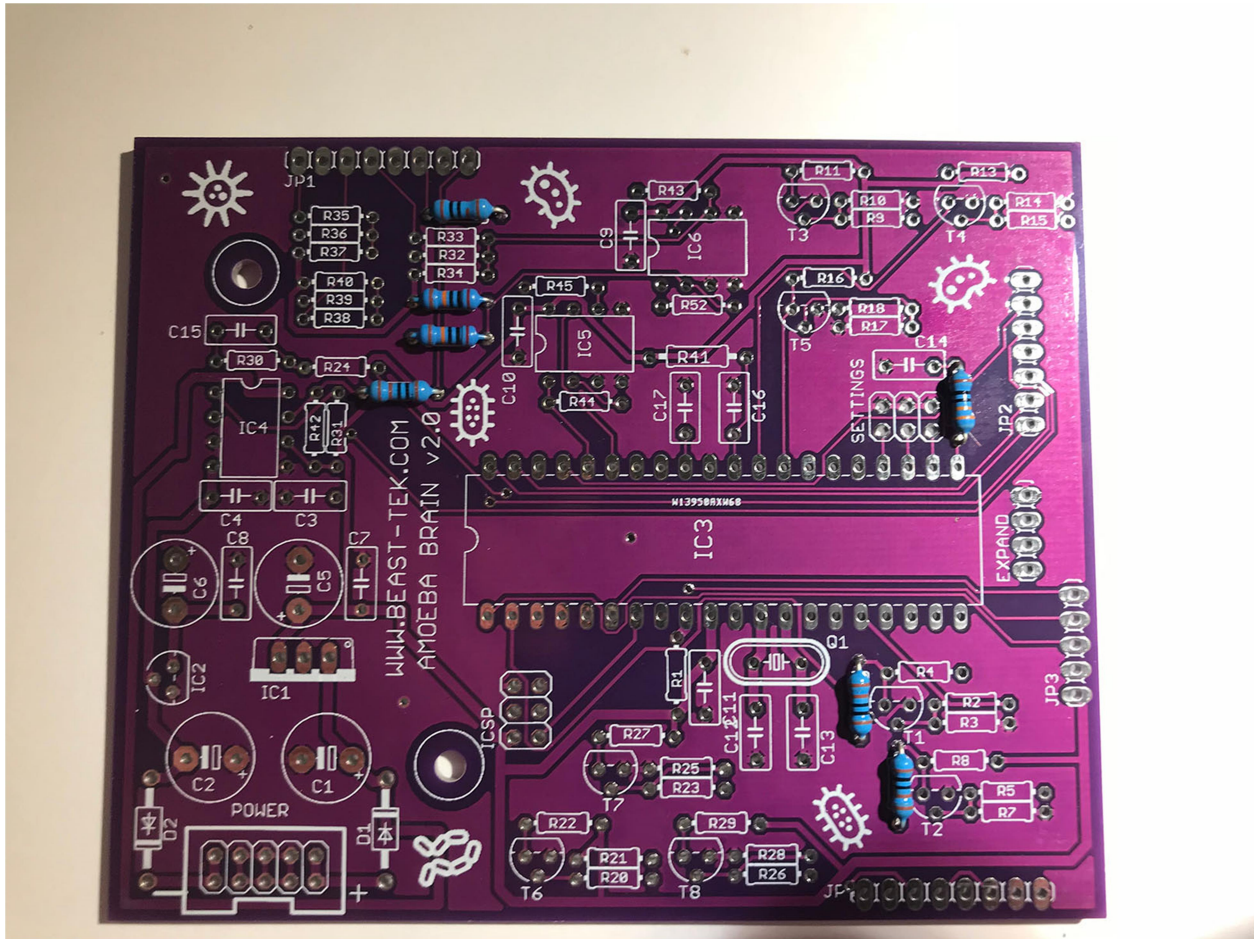
1. Install and solder 200K resistors R48 and R49



2. Install and solder 330R resistor R19

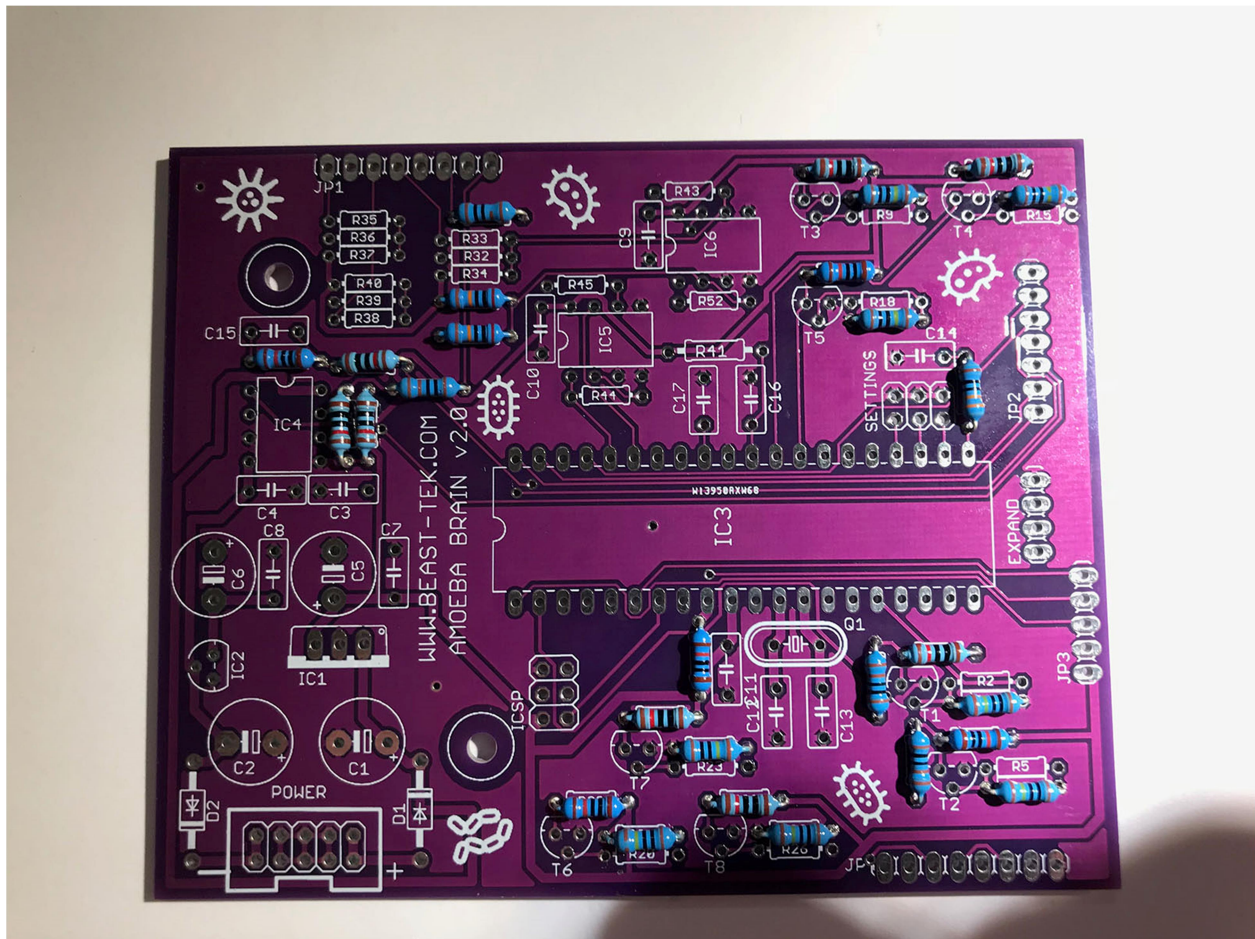


3. Install and solder 1K resistors R6, R12, R46, R53

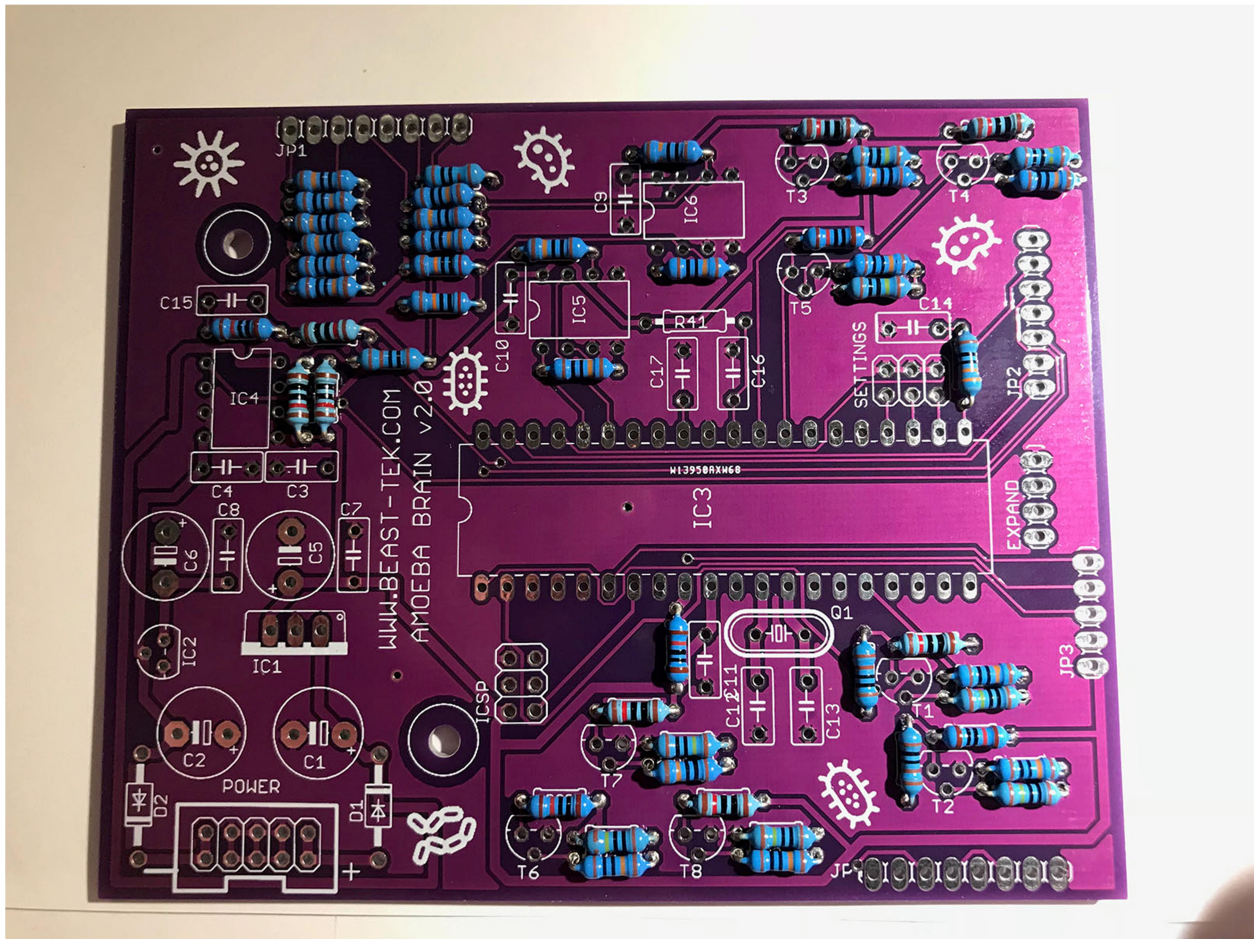


4. Install and solder 1M resistors R3, R7, R10, R14, R17, R21, R25, R28

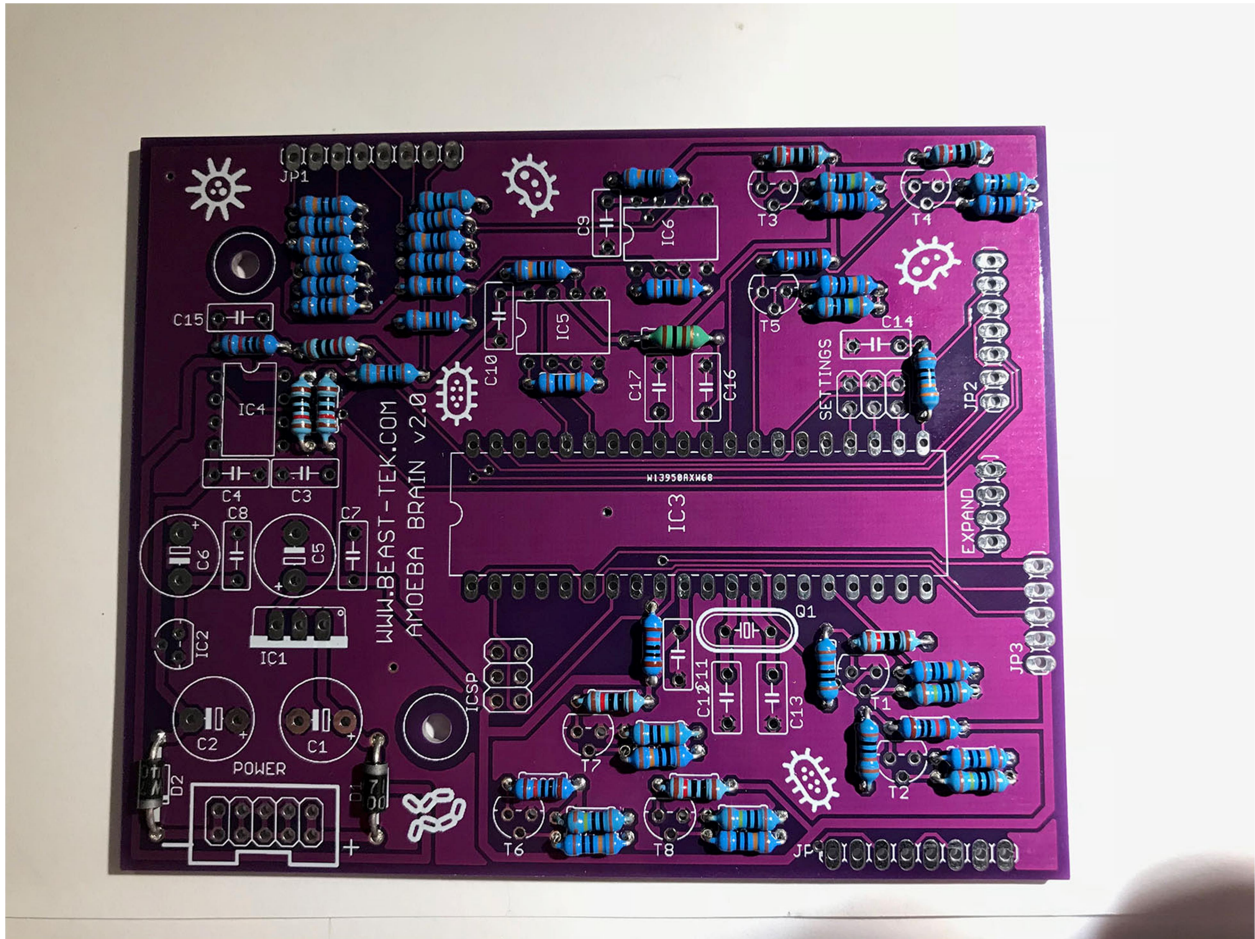
Next install and solder 10k resistors R1, R4, R8, R11, R13, R16, R22, R24, R27, R29, R30, R31 and R42



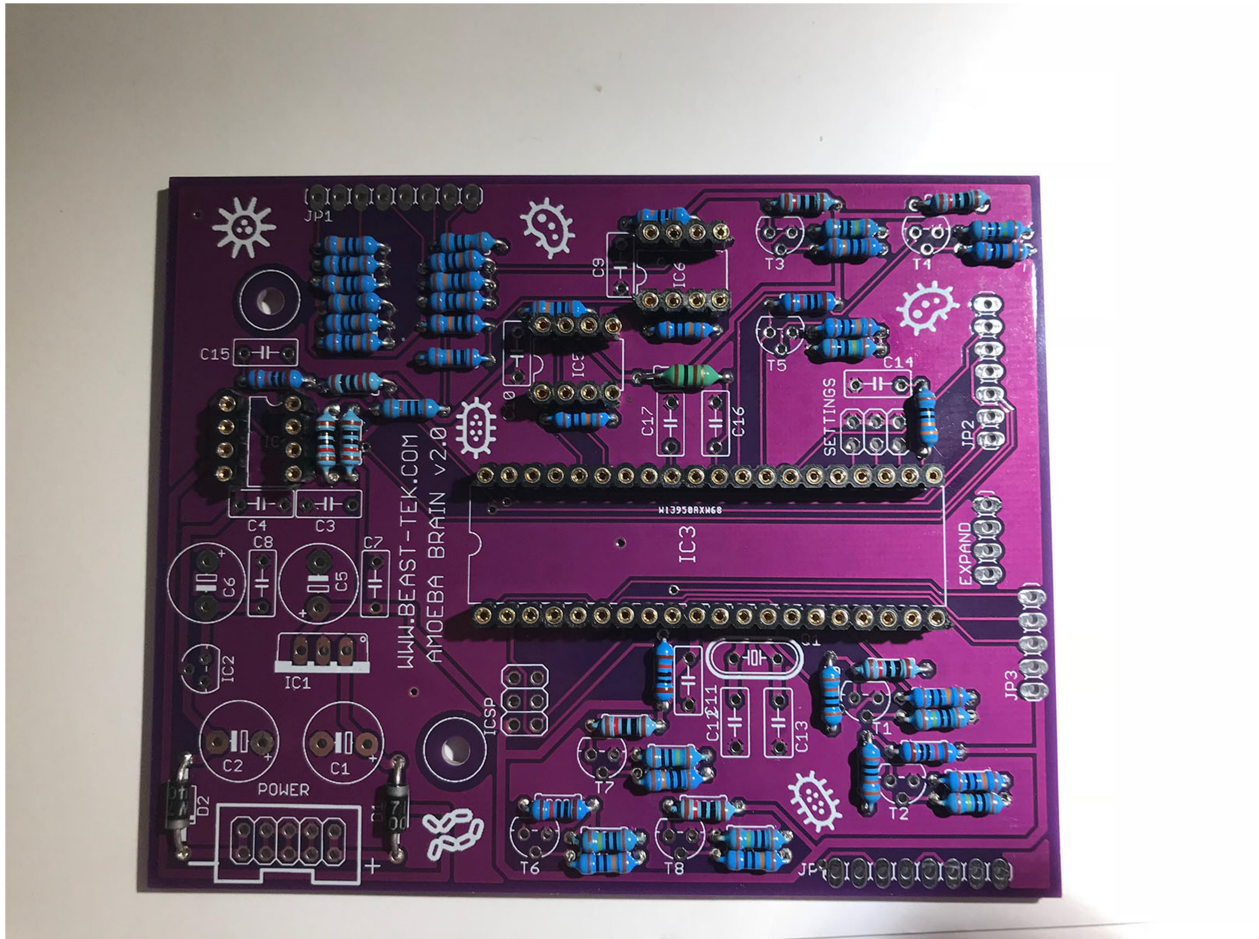
5. Install and solder 100K resistors R2, R5, R9, R15, R18, R20, R23, R26, R32, R33, R34, R35, R36, R37, R38, R39, R40, R43, R44, R45 and R52



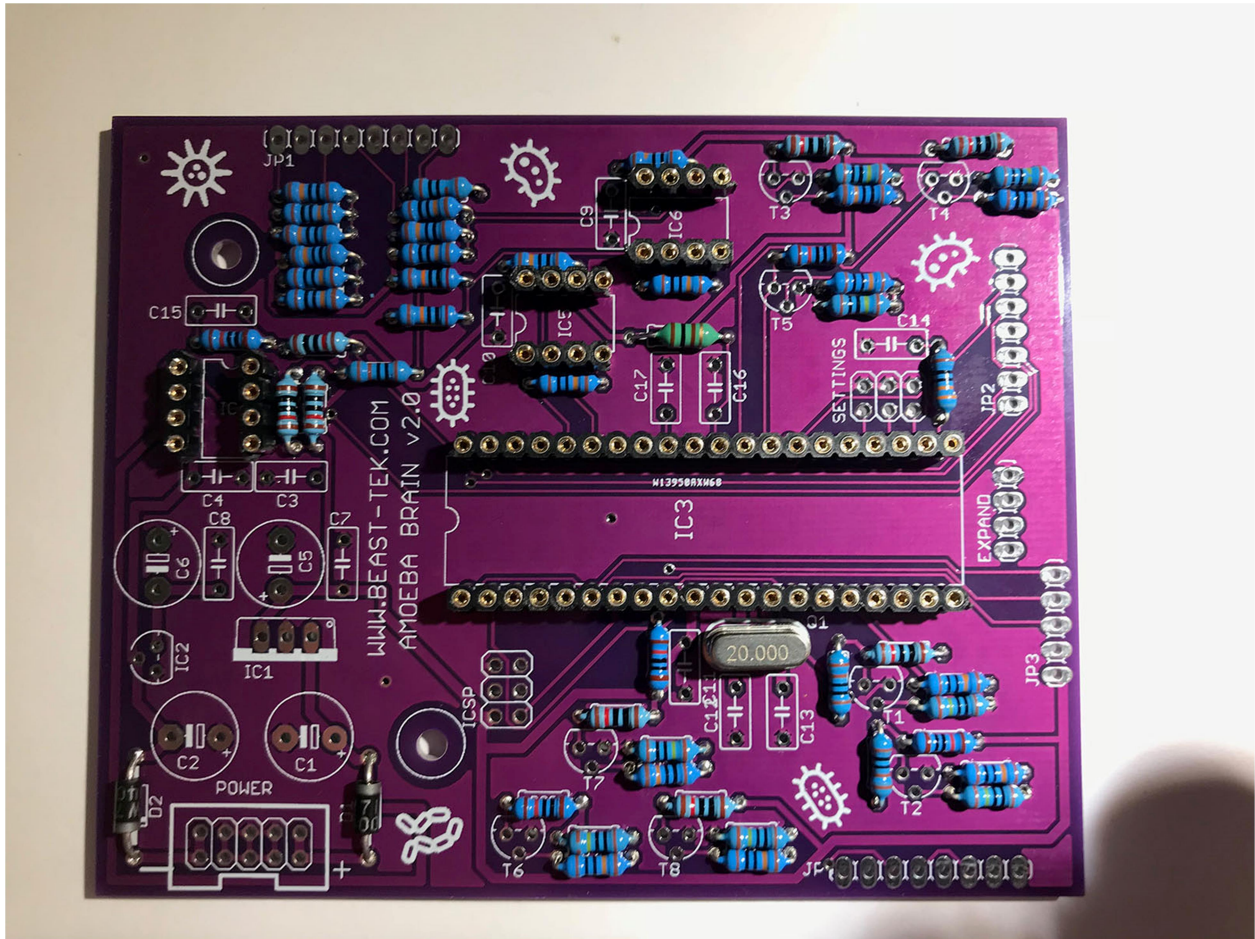
6. Install the two power diodes and inductor R41



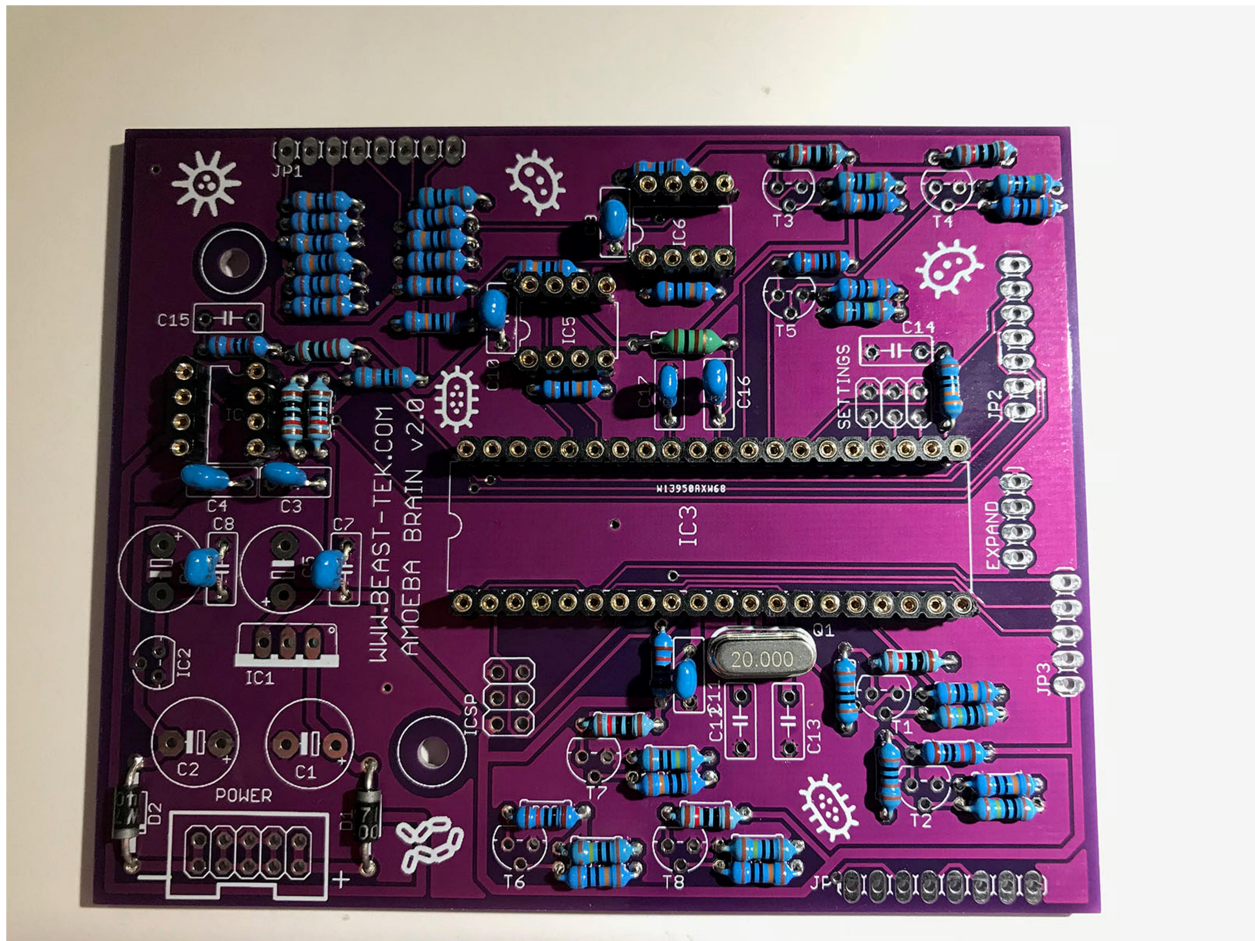
7. Cut the IC sockets from the machine pin strips and install and solder



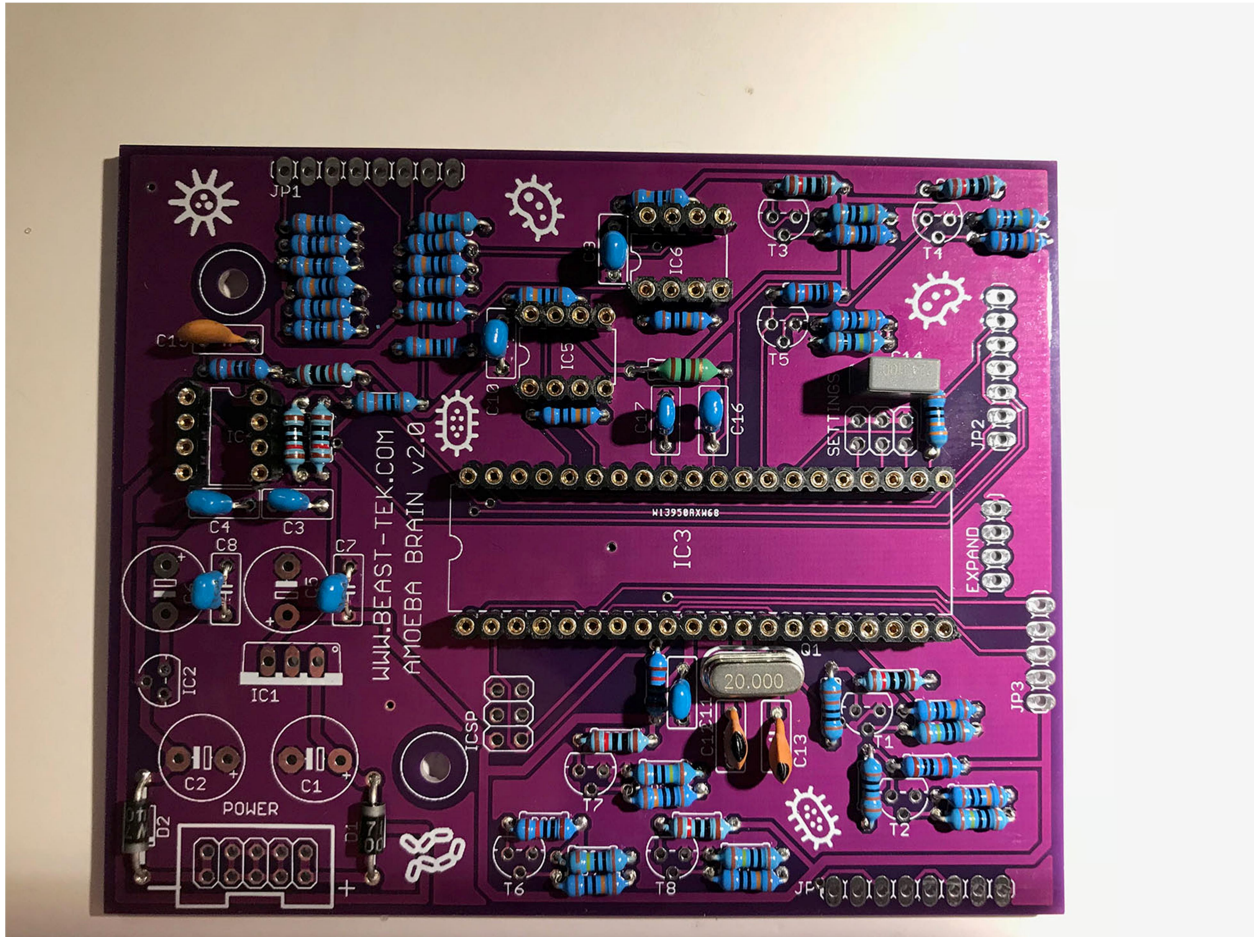
8. Install the 20mhz crystal Q1 and solder



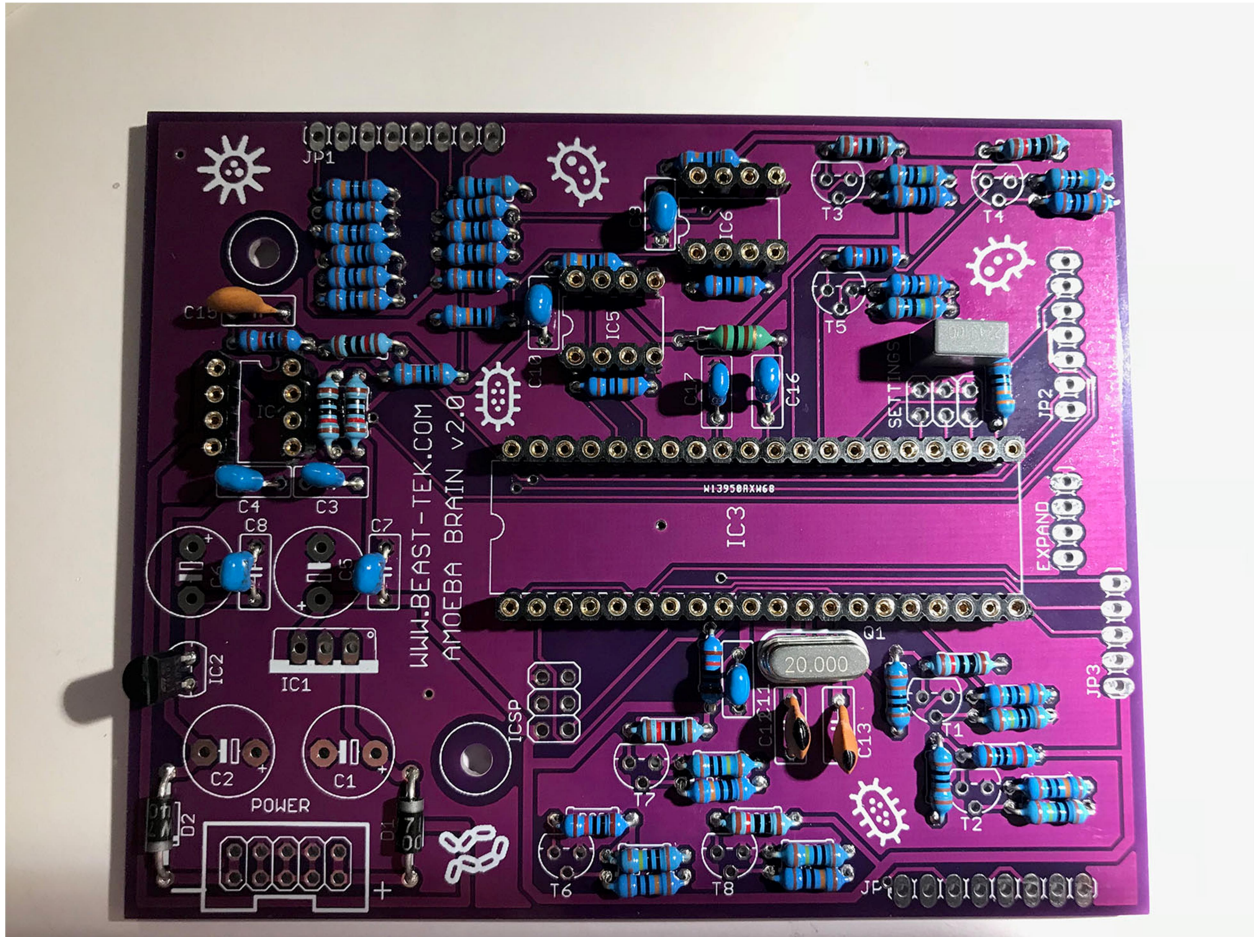
9. Install and solder 100nf capacitors C3, C4, C7, C8, C9, C10, C11, C16, C17



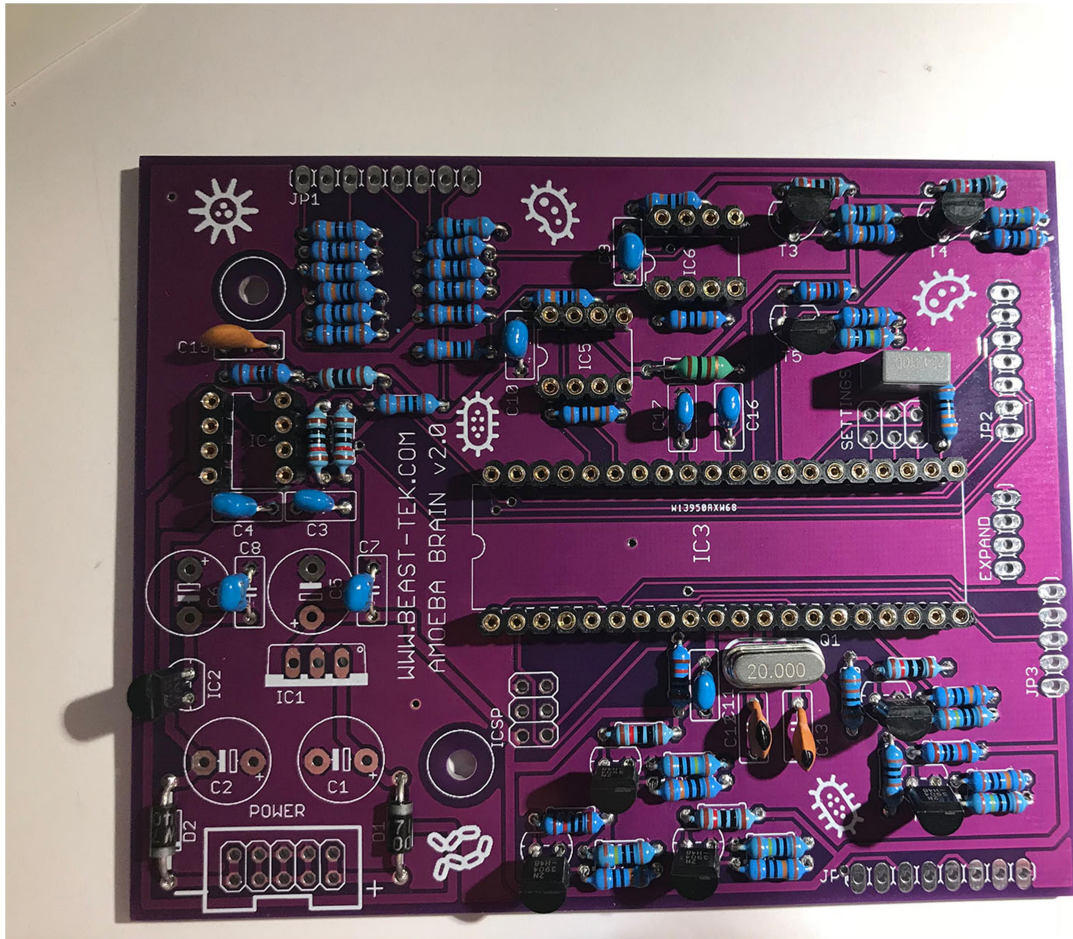
10. Install and solder the two 22pf capacitors C12 and C13, one 220nf capacitor C14 and the 10nf capacitor C15



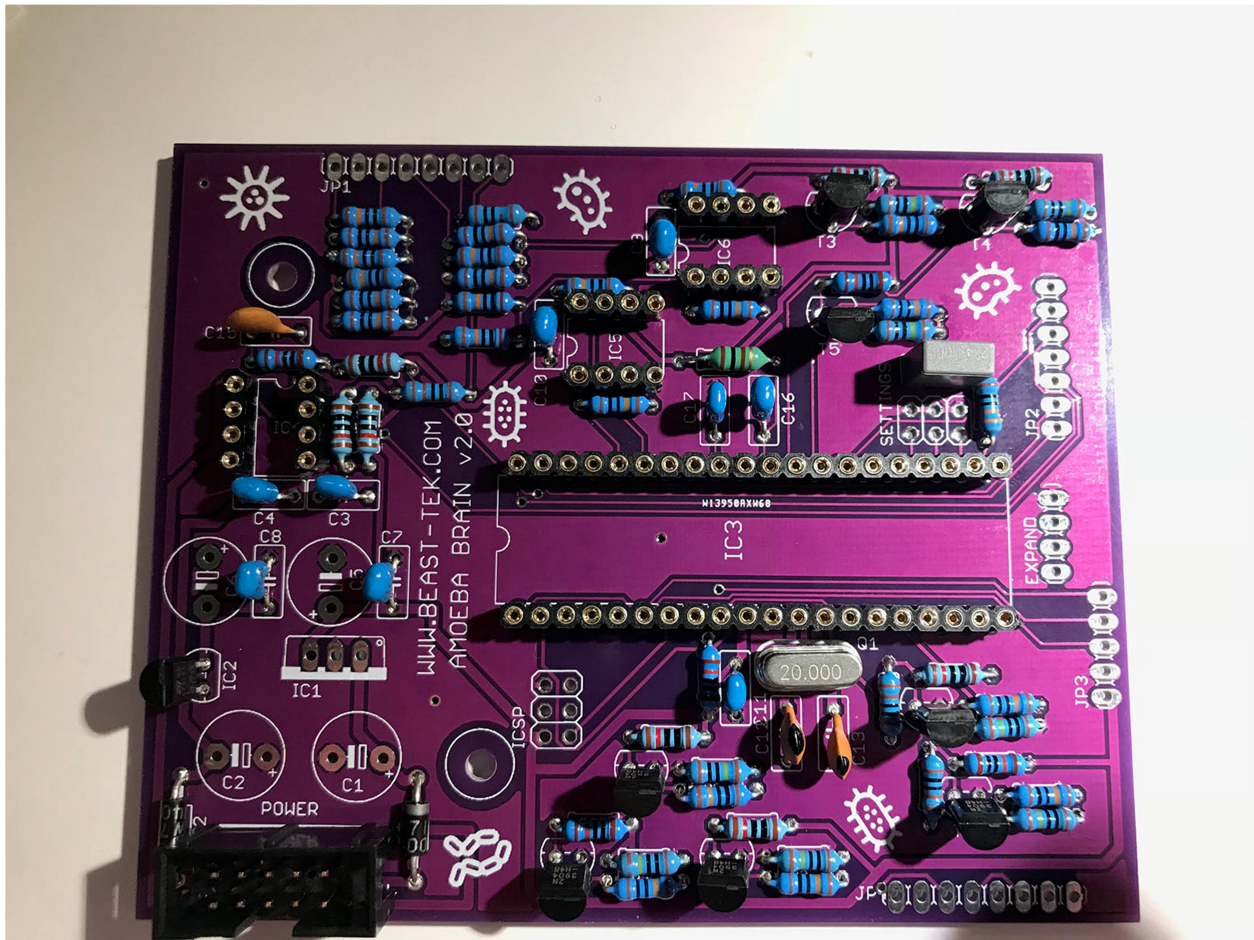
11. Locate and double check the 79L05 voltage regulator, be careful as it has the same package as the 2N3904 transistors! When you are sure you have found the 79L05, install and solder it into IC2



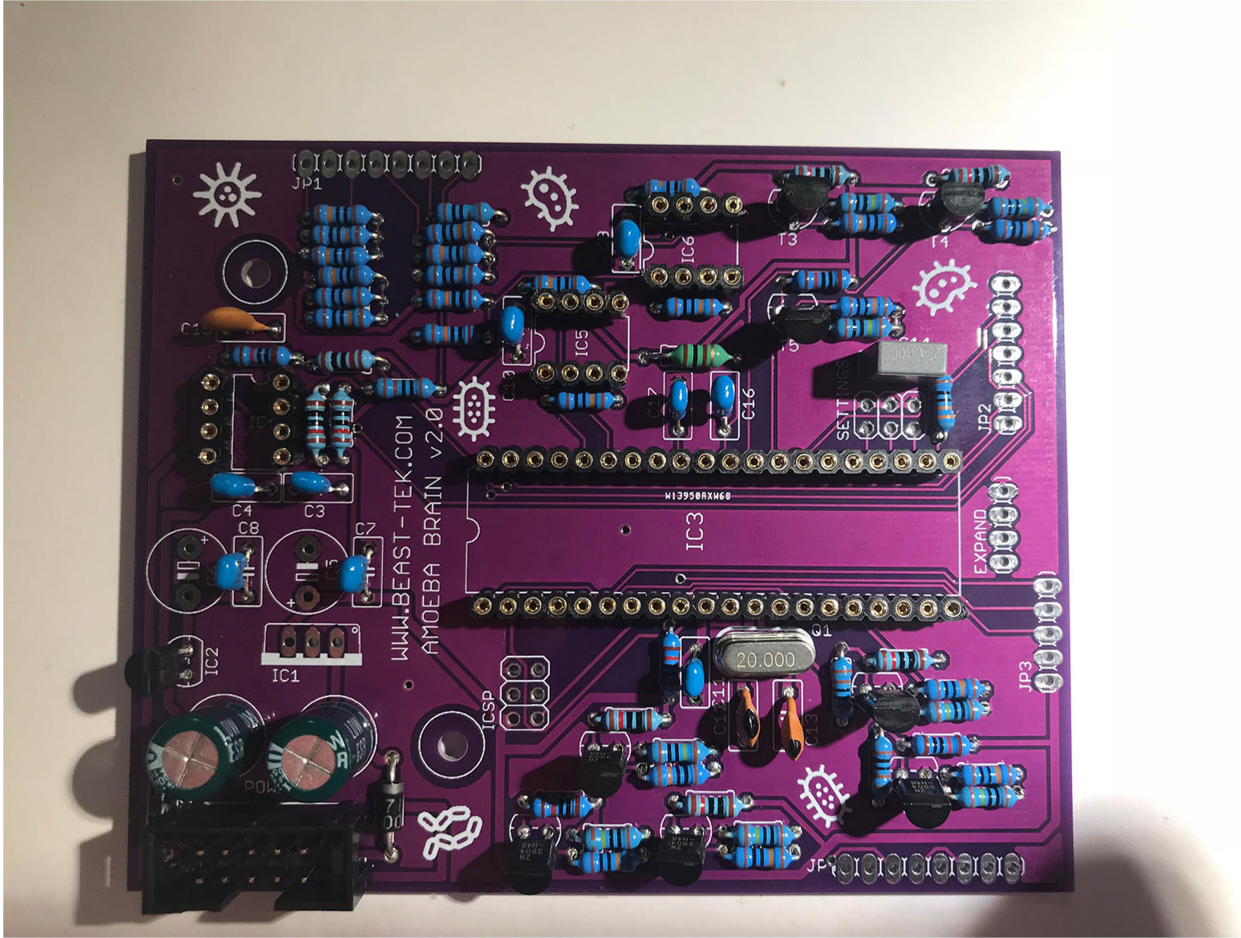
12. Install and solder the eight 2N3904 transistors T1-T8



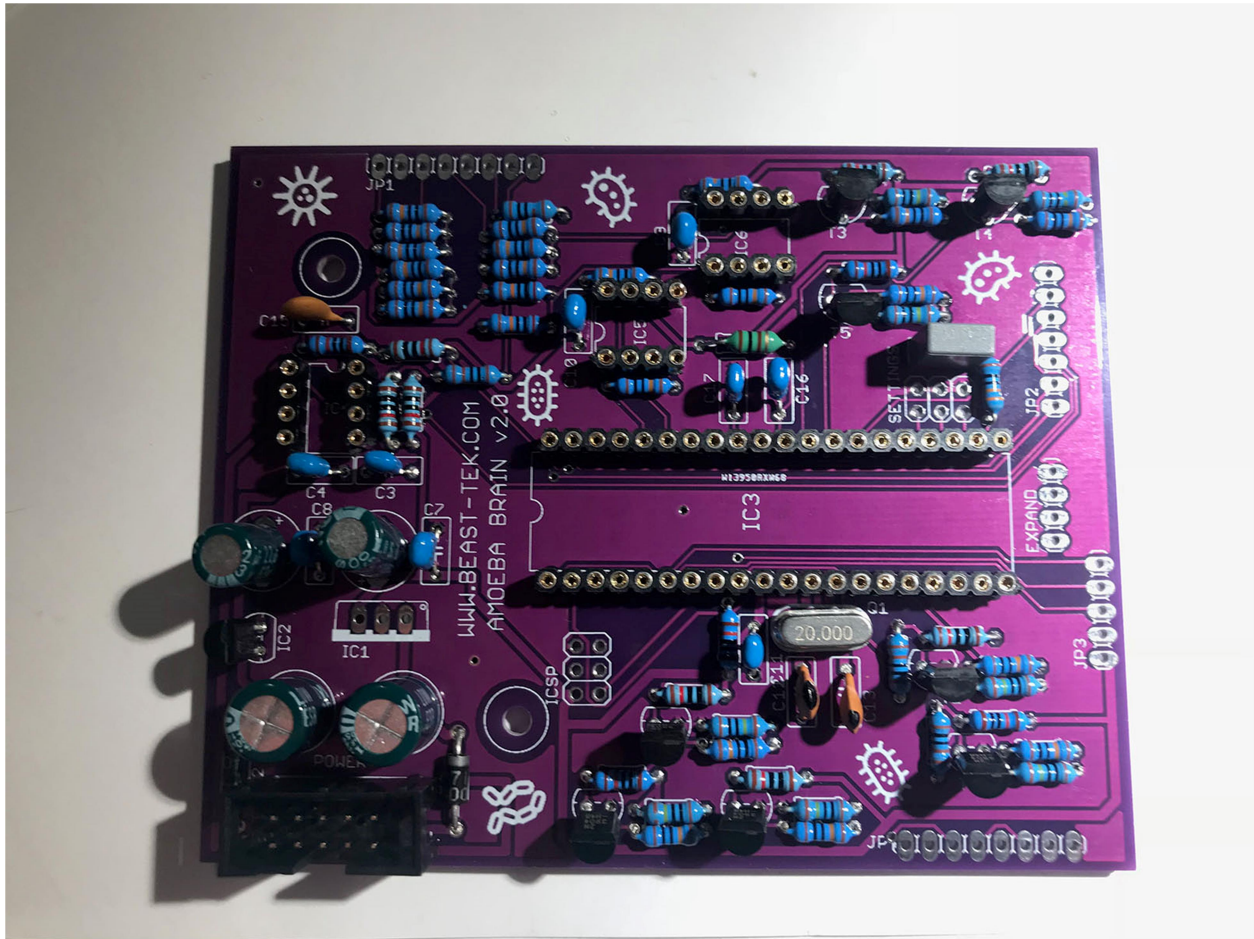
13. Install and solder the 10 pin IDC power connector. Now is a good time to cut two 3 pin strips from the male pin header strip and solder them into the settings header (located next to IC3) .. I didn't do this until later in the build and it's a lot trickier if you leave it until later!



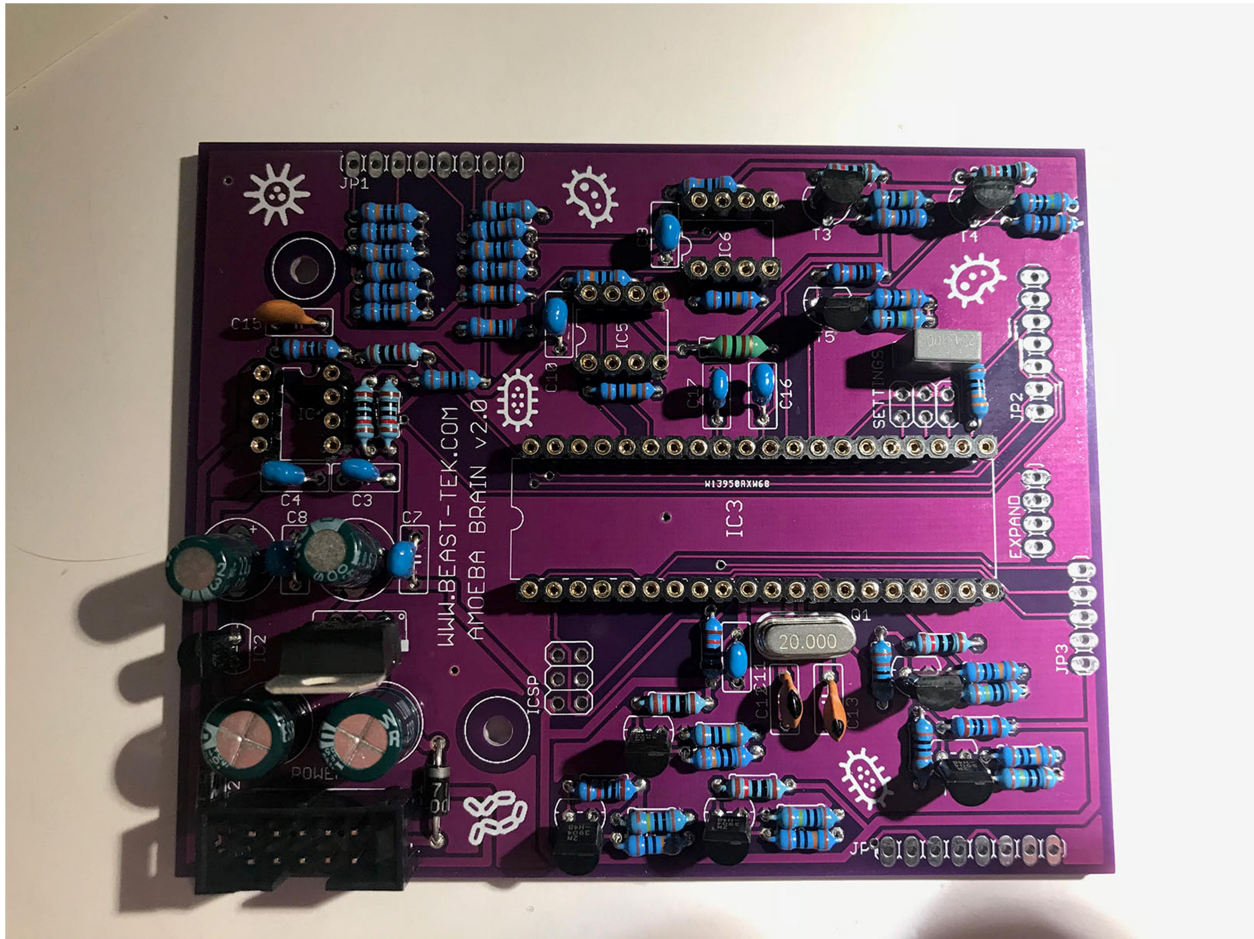
14. Install and solder the two 100uf capacitors C1 and C2 – double check polarity!



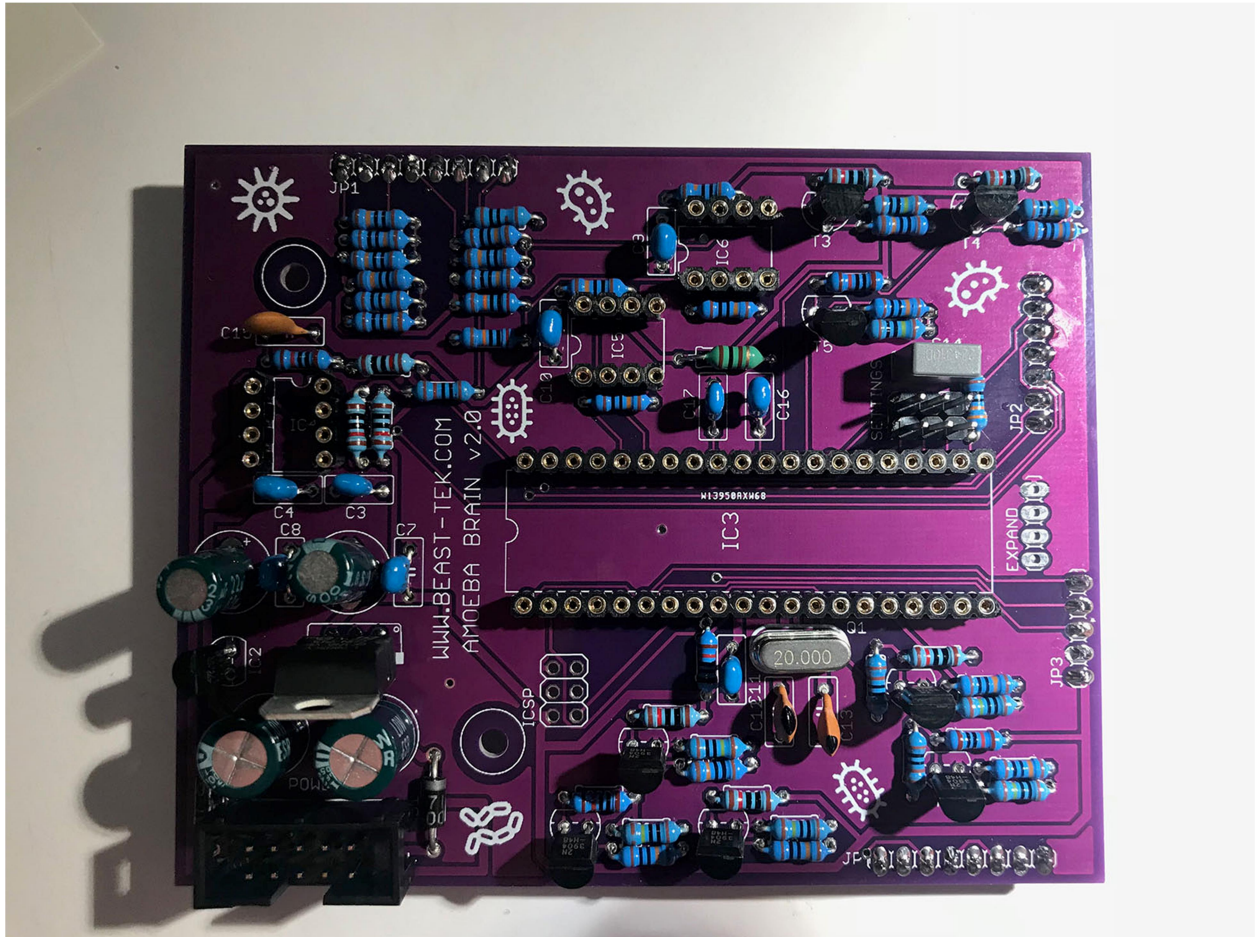
15. Install and solder the two 22uf capacitors C5 and C6, again checking polarity!



16. Install and solder the 7805 voltage regulator



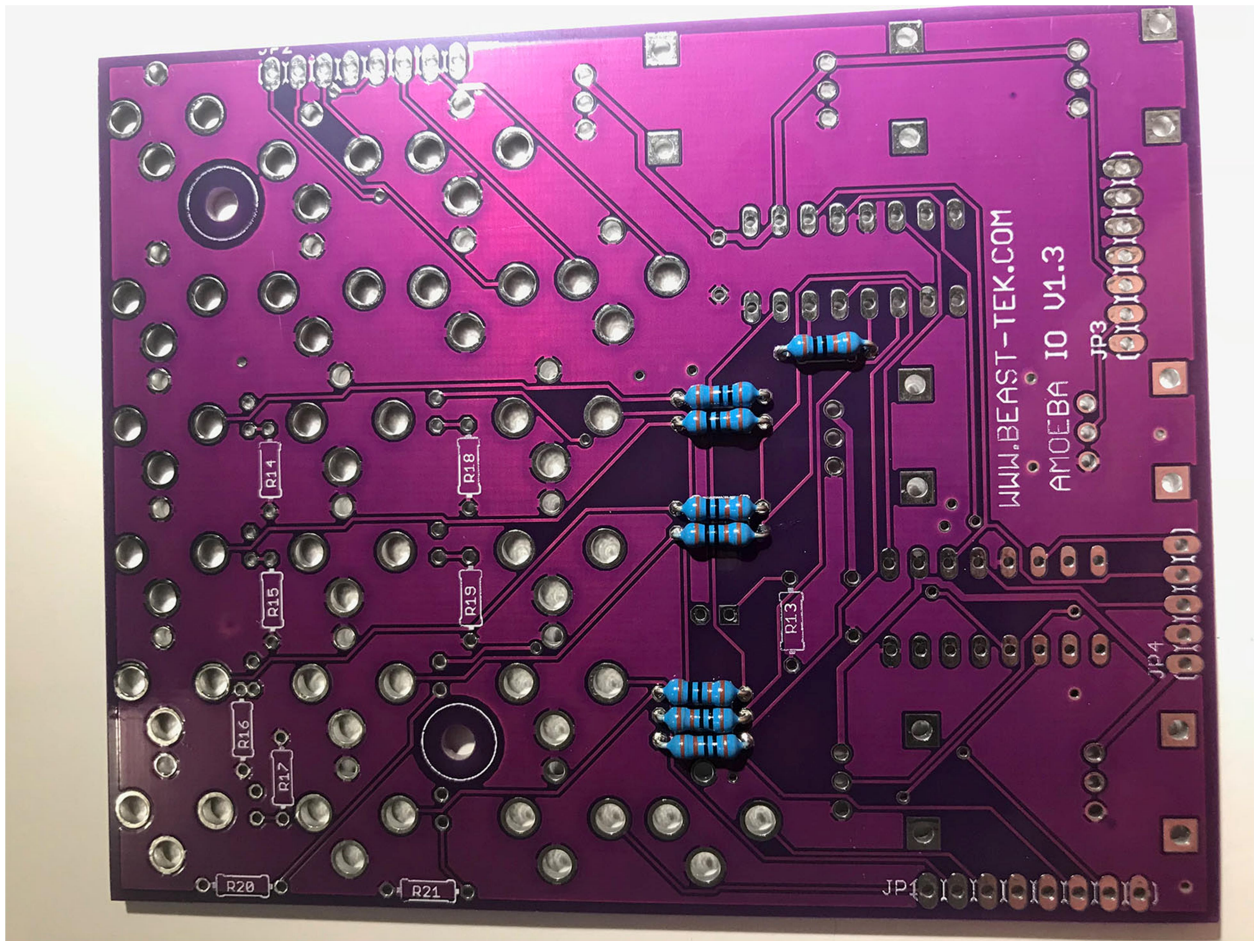
17. Cut two 8 pin, one 7 pin and one 5 pin pieces from the FEMALE header pin strip. Remove the pins using pliers where you intend to cut (prior to cutting) in order to make the cuts easier and cleaner.



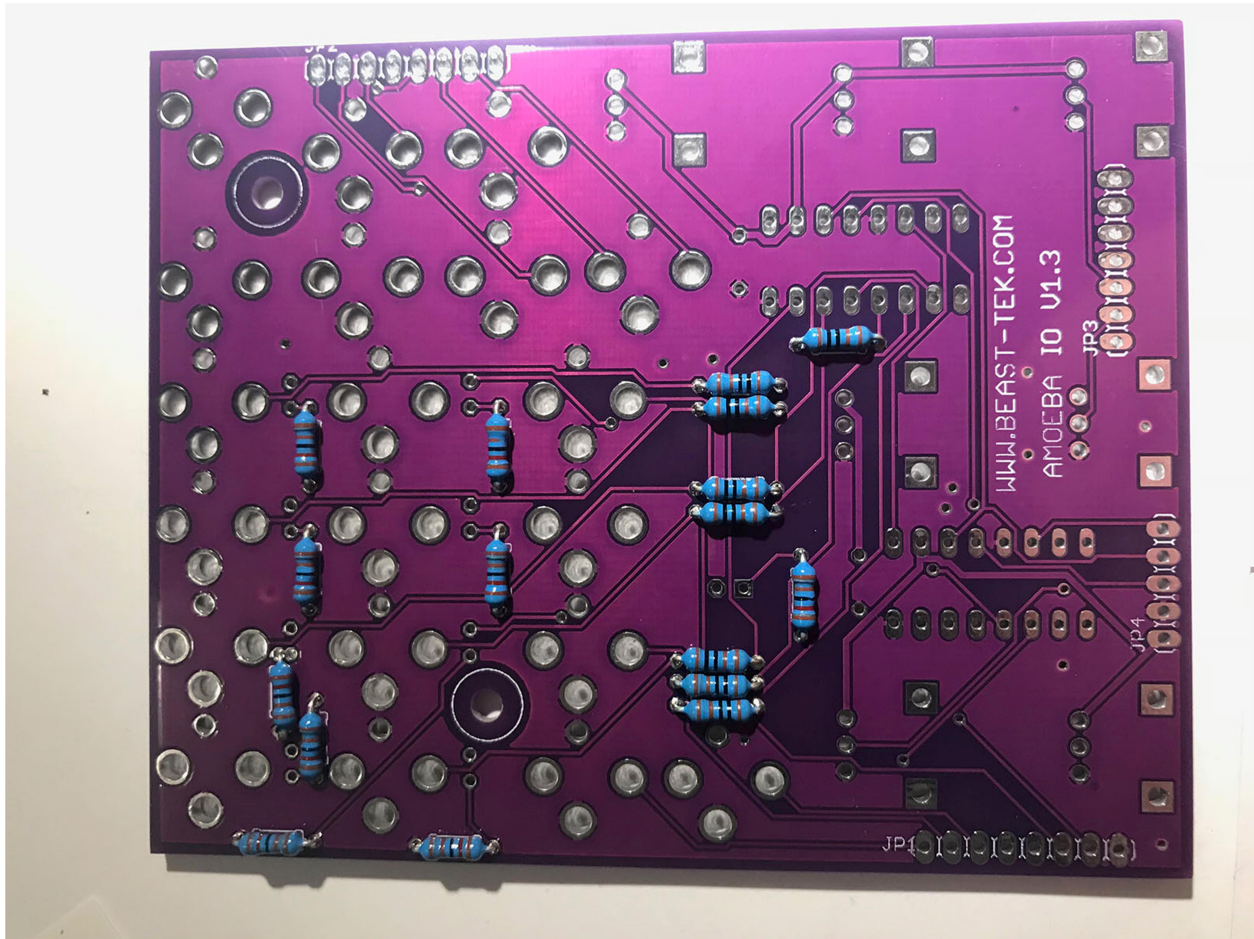
18. Now install the IC's and your done! Make sure IC4 is the TL072



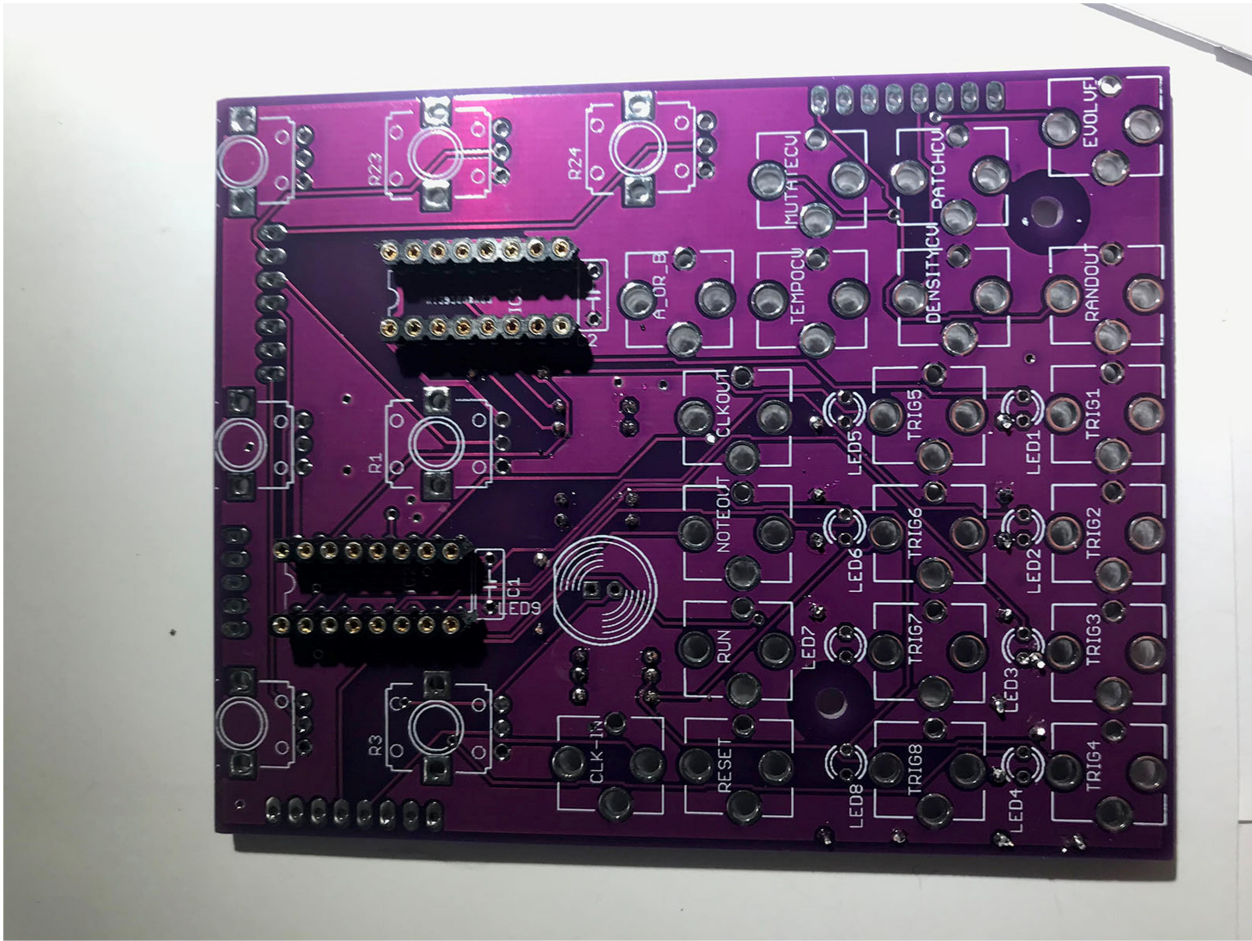
19. Install and solder the eight 1K resistors R5, R6, R7, R8, R9, R10, R11, R12



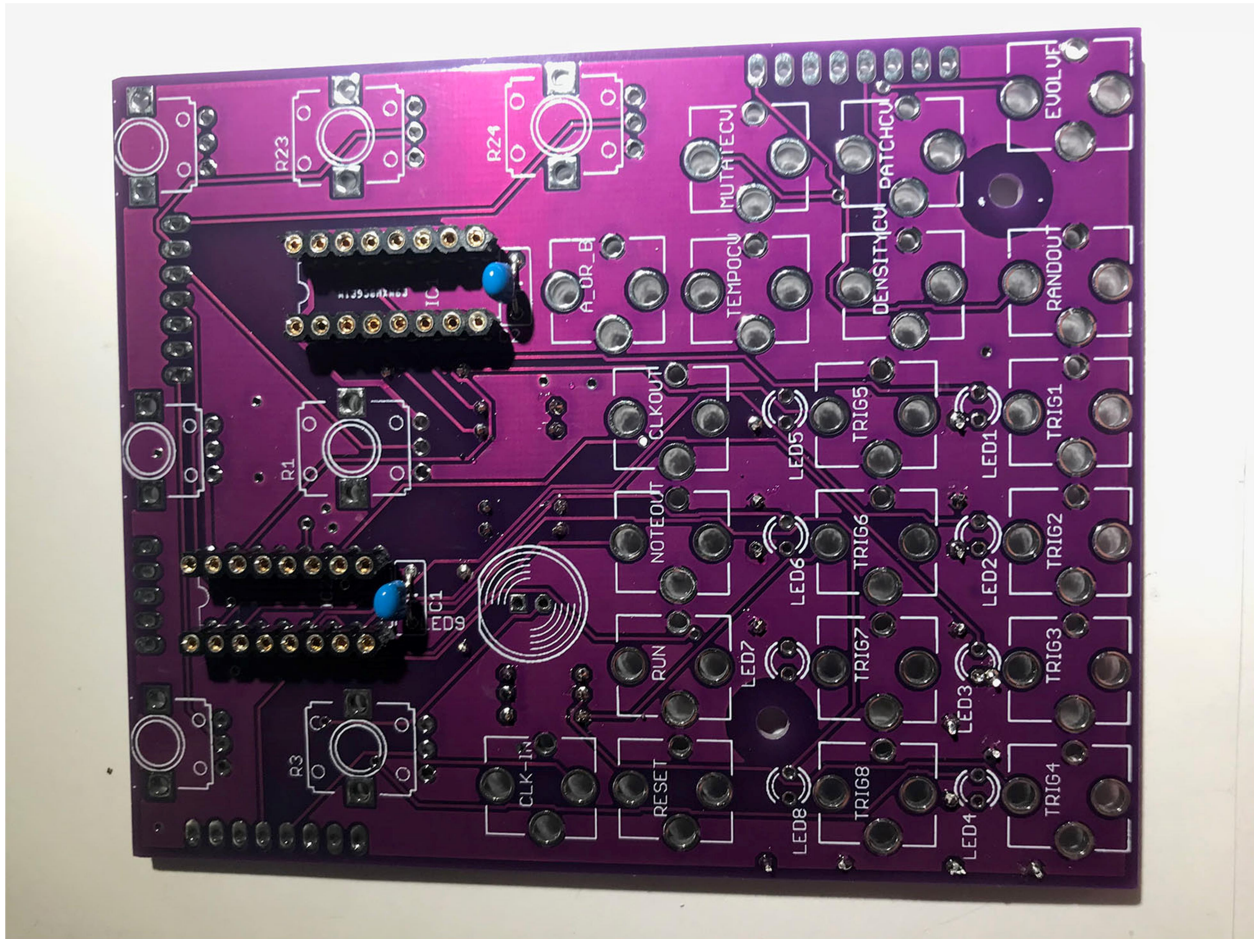
20. Install and solder the nine 1K2 resistors R13, R14, R15, R16, R17, R18, R19, R20 and R21



21. Cut IC sockets from the machine pin strips and solder into place

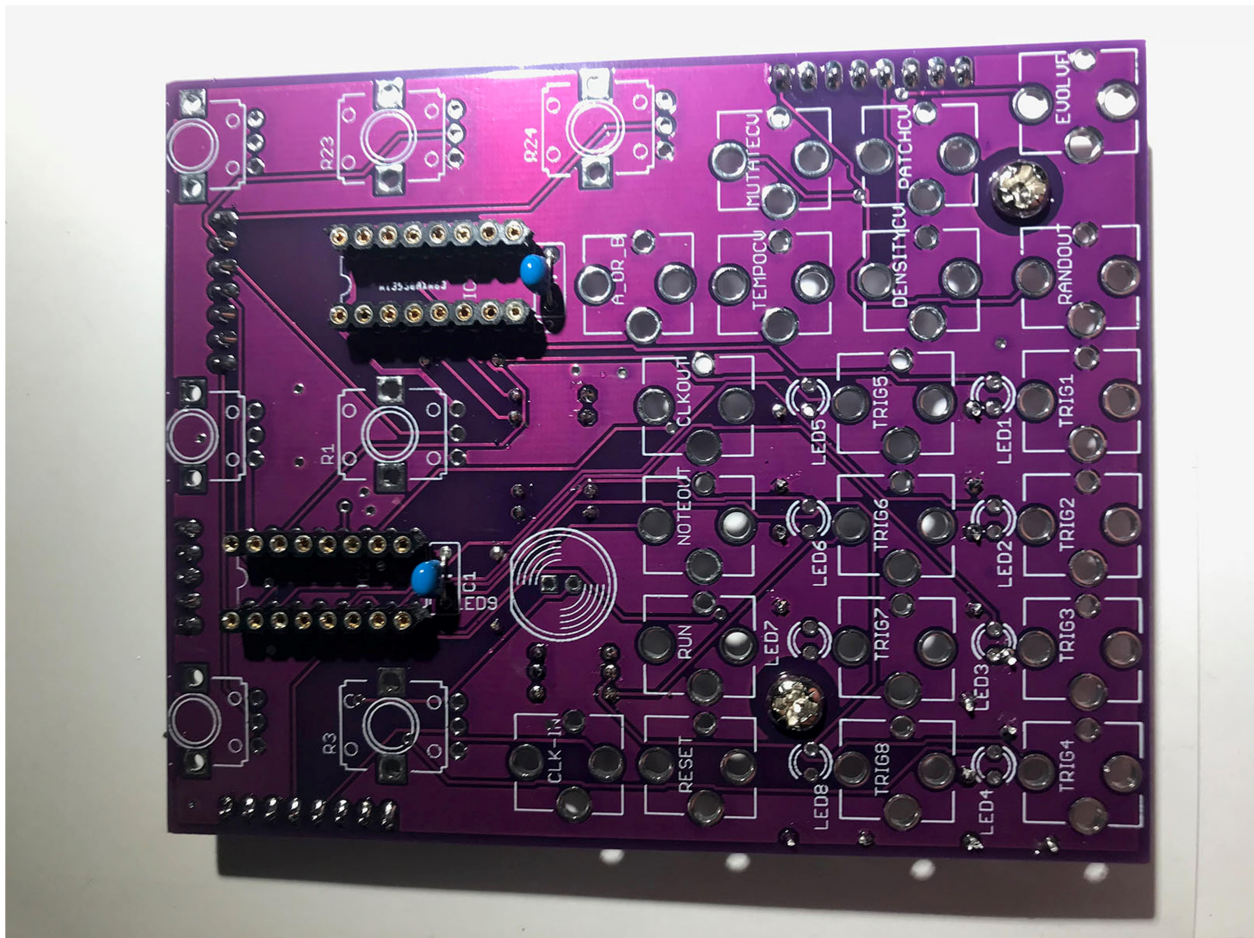


22. Install and solder the two 100nf capacitors C1 and C2

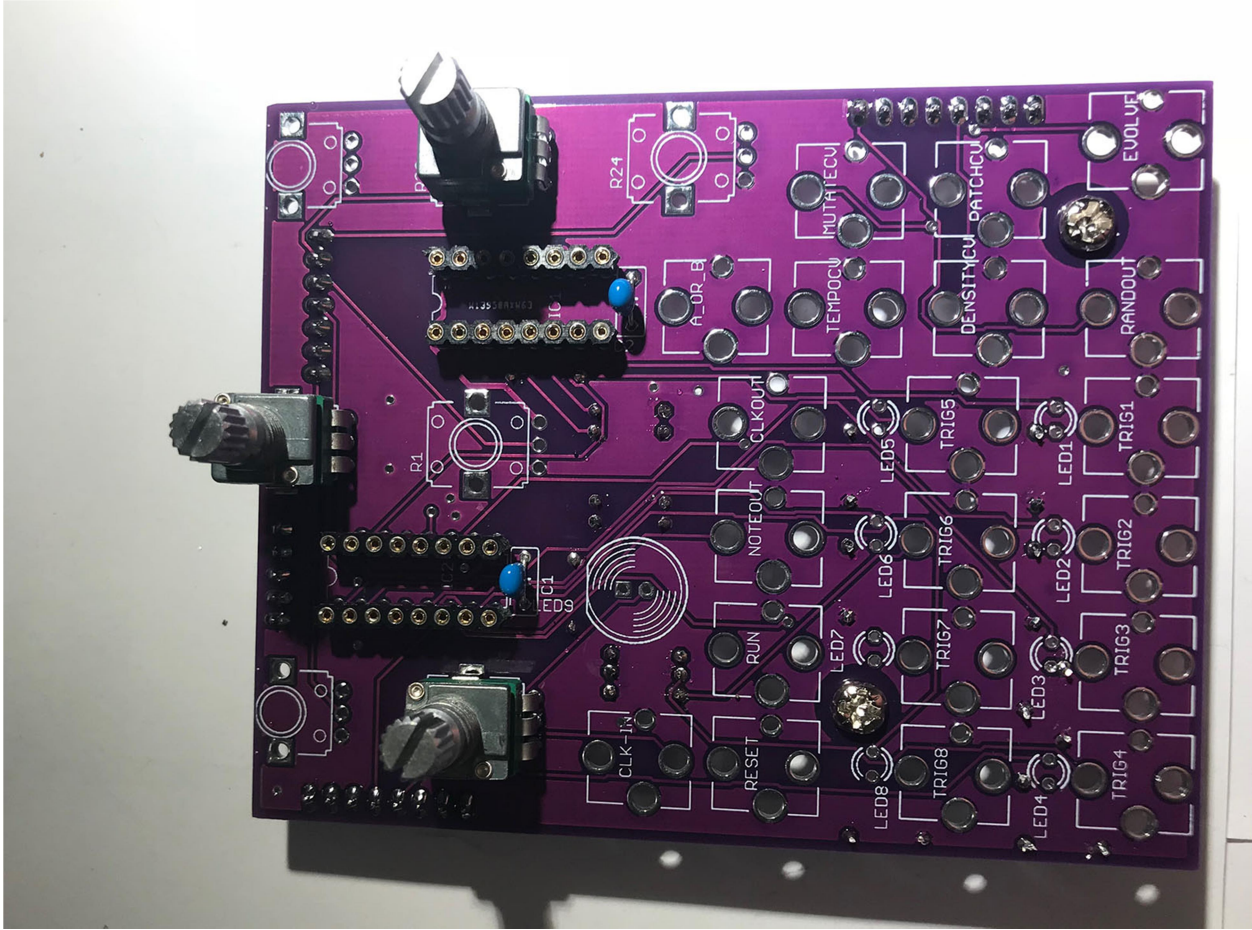


23. Cut two 8 pin one 7 pin and one 5 pin pieces from the MALE header pin strip and solder into place.

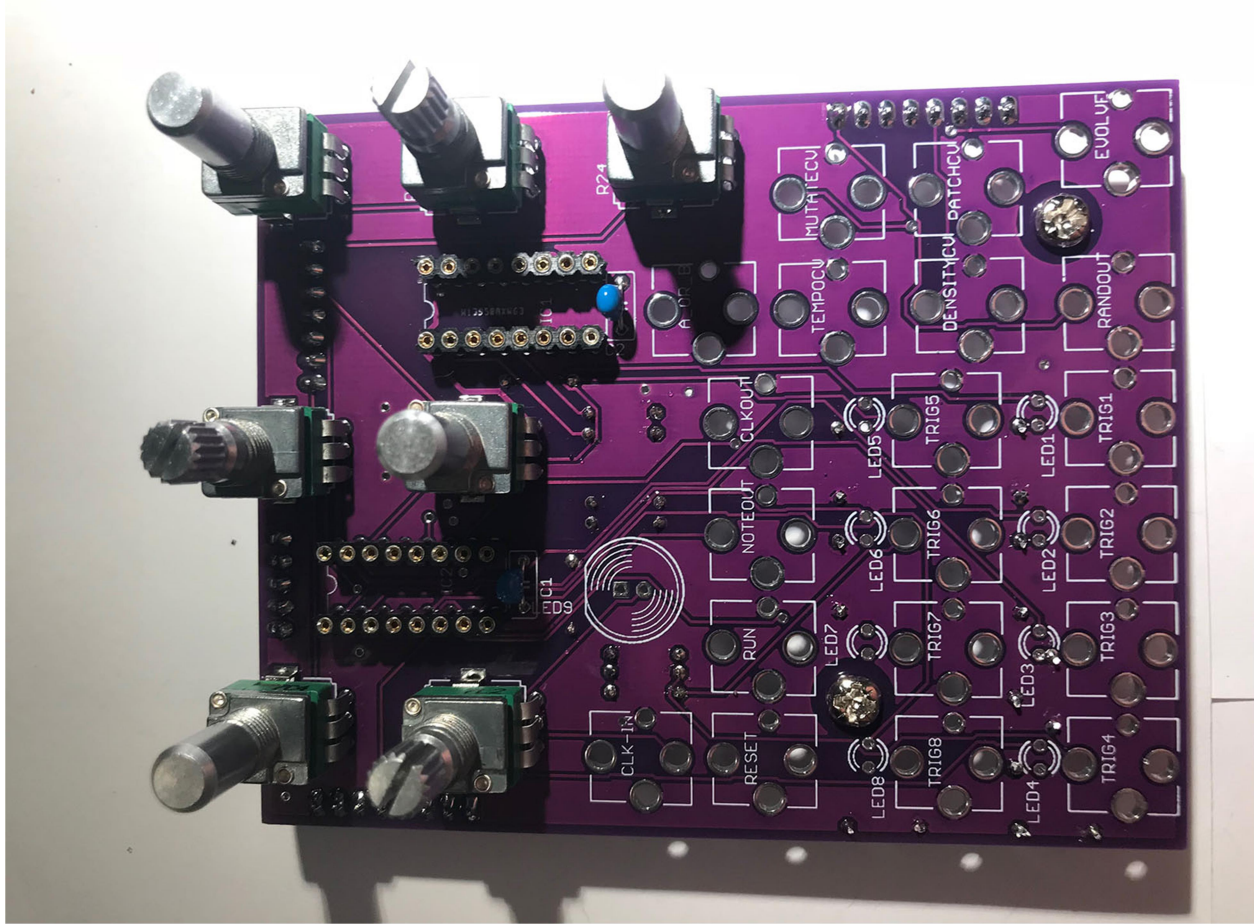
Use two 6mm M3 screws and place into the two screw holes, attaching the two 11mm brass stand-offs on the reverse side



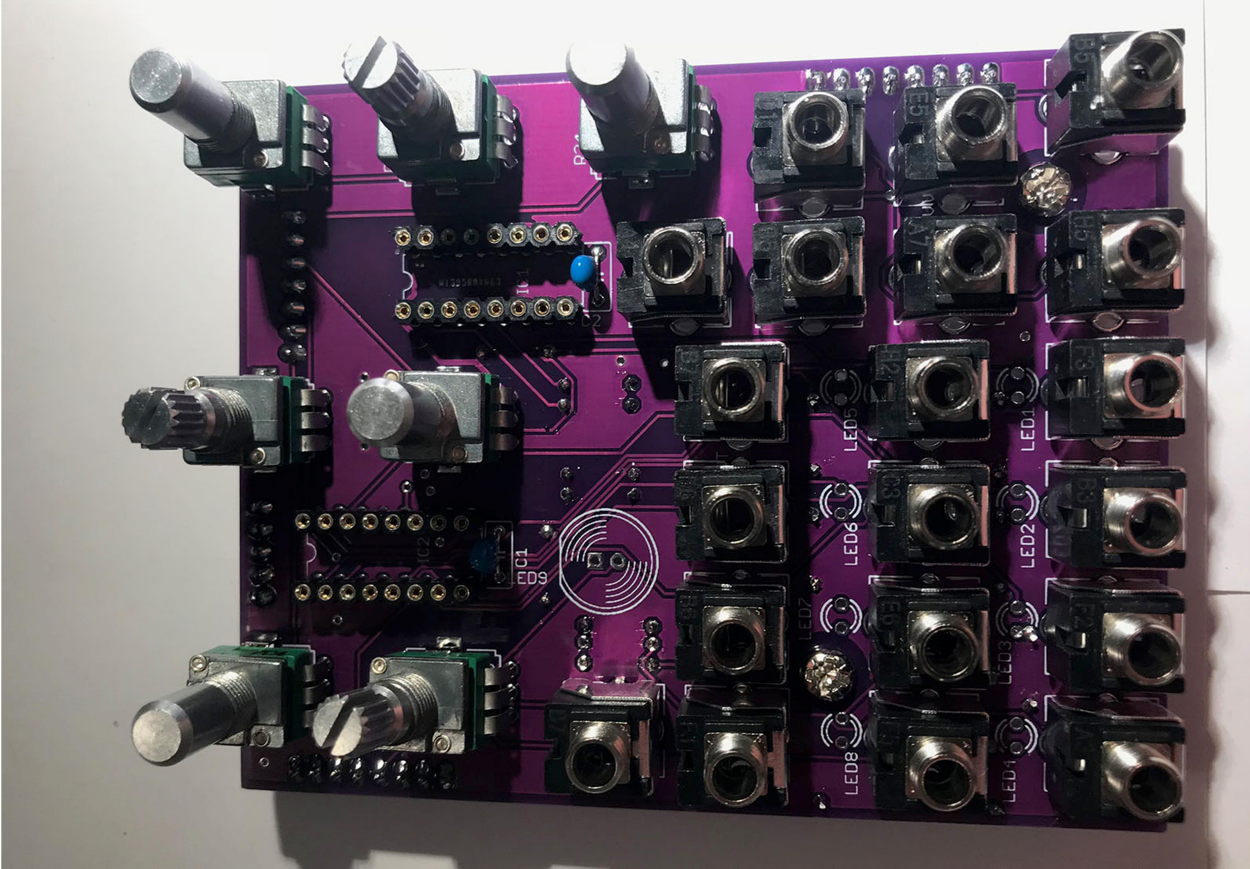
24. Install but DO NOT SOLDER the three 10KB pots with T18 knurled shafts



25. Install but DO NOT SOLDER the four 10KB round shaft pots



26. Install the twenty jacks. DO NOT SOLDER YET!!!

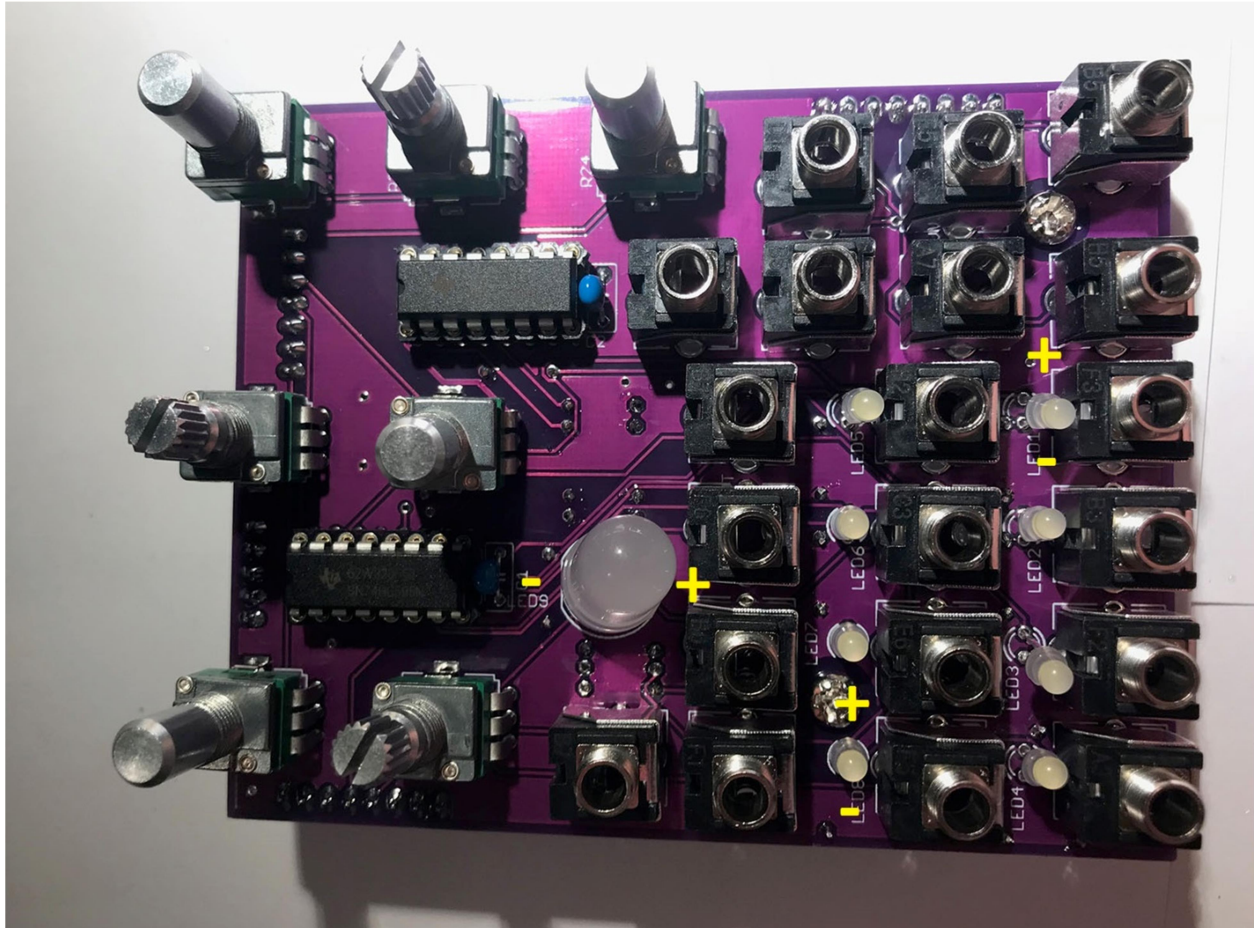


27. Place the clear acrylic panel over the top of the pots and jacks and wiggle it around so that the jacks and pots sit neatly. CAREFULLY flip together then solder ONLY THE GROUND PIN of the jacks to hold them in place!! DO NOT solder the other jack pins AND DO NOT solder any of the pots YET!

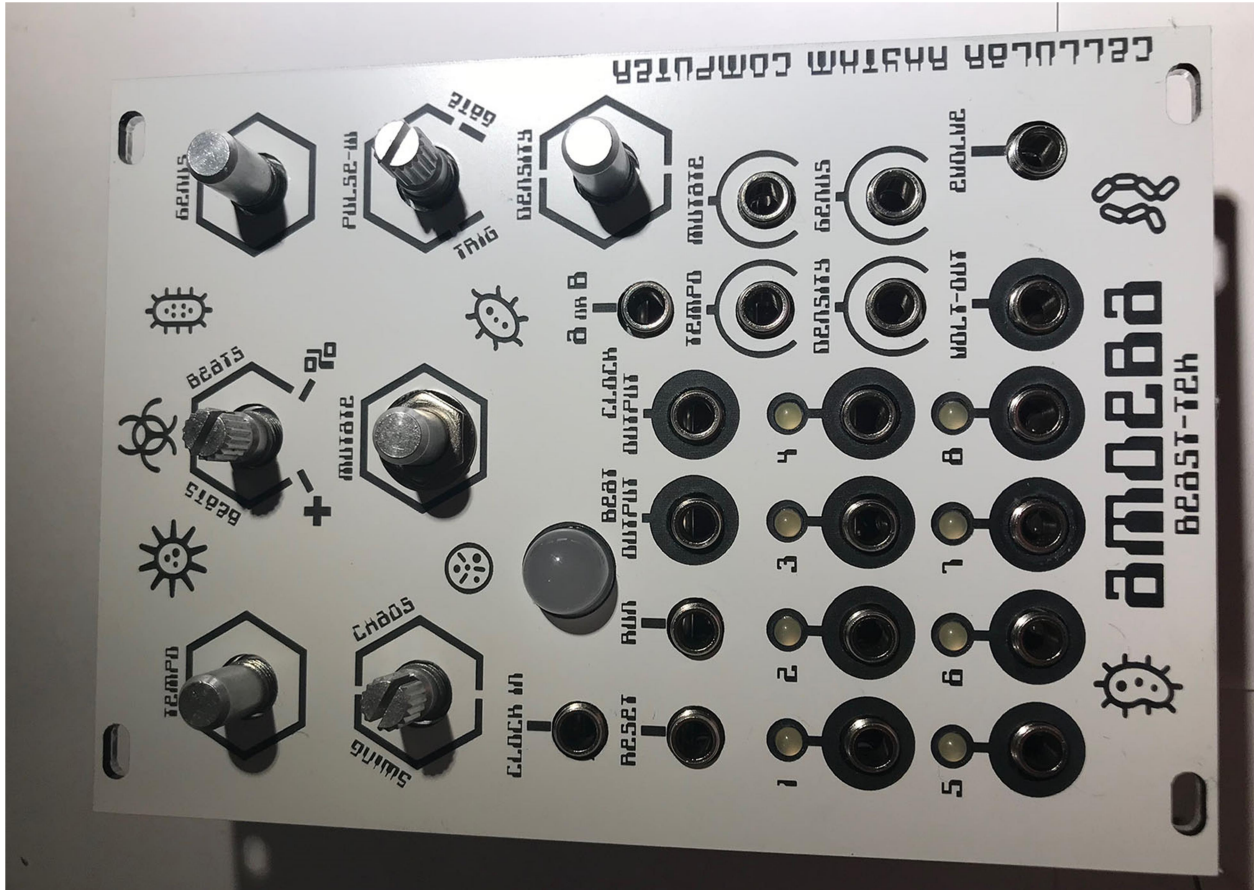


28. Once one pin of the jacks has been soldered, they will stay in place. Remove the clear acrylic panel and install the two remaining IC's.

Install but DO NOT SOLDER the nine leds. The eight 3mm leds are all oriented the same direction. Orientation is shown in the diagram below. Remember the shorter lead is negative and the longer lead is positive.



29. Peel the protective coating from the clear acrylic sheet. Place the front panel on top of the clear acrylic panel. Now place over the jacks and pots and wiggle things into place so the panel sits nicely. DON'T put any nuts on the jacks or pots yet. First push the big 10mm LED via its leads through the panel. Next work through the eight 3mm leds pushing them through one by one so they are flush with the panel. If you put any nuts on the jacks or pots, you will need to remove them so that the LEDs can be pushed through the panel without issue. Once all LEDs are pushed through and sitting nicely in the panel, install one jack nut and finger tighten it to hold the panel loosely in place.



30. With the jack nut holding the front panel in place, give everything a wiggle around so that everything is sitting nicely. Take time and inspect that all the jacks and pots are sitting nicely. Now install washers and nuts on the four potentiometers and tighten (but don't over tighten, the pots aren't soldered and if you tighten them too much the pot leads will bend).

Now install the remaining nuts on all of the jacks, giving each one a wiggle as tightening up so that they all sit flush. Give everything a final wiggle and make sure everything is seated well. The panel and sockets are still reasonable flexible until everything is soldered in.

Once you are happy that everything is seated correctly and flush, flip the panel over and solder all of the remaining jack pins and the pots and LEDs into place.



31. Take time to check both boards for missing solder joints or sloppy solder joints. If everything looks okay, its time to join them together. Join the two boards together via the pin headers and use two 6mm M3 screws to secure them together (via the brass stand offs).

