PROJECT NAME

VECTOR

aion DIY GUITAR EFFECTS

BASED ON
Mad Professor® Deep Blue Delay

BUILD DIFFICULTY
Intermediate

EFFECT TYPE
Delay

DOCUMENT VERSION
1.0.3 (2024-08-08)

PROJECT SUMMARY
With similar frequency bandwidth to a tape unit, this analog-voiced digital delay is a favorite even among analog purists.

IMPORTANT NOTE

This documentation is for the **kit** version of the project. If you purchased the PCB by itself, please use the PCB-only version of the documentation instead. The circuit is the same, but the instructions are completely different due to the specialized parts and assembly methods used in the kit.

TABLE OF CONTENTS

INTRODUCTION

If this is your first pedal, welcome to the hobby and thank you for choosing Aion FX. You've just joined a community of over 100,000 people around the world with a passion for building homemade noise machines using obsolete electronics technology, and we're glad to have you!

If you've done this before, it's great to see you again and we're confident you'll find this build experience an enjoyable one.

Aion FX kits are designed to empower anyone to build a high-quality pedal, no matter the skill level. The pedalbuilding hobby has traditionally had a steep learning curve, but don't be overwhelmed—we've done all the hard work for you. All you need to do is follow these instructions and you'll be on your way to transforming your tone.

There are a few things to go over before you get started.

- **You're going to have to get your hands dirty**—there's no way around it. Nothing here comes preassembled, and you'll have to learn the skills to put it all together. This document will walk you through everything you need, but be prepared to learn a few things along the way.
- **This will take time**. Plan on about two hours start to finish. It may take even longer if it's your first time building. Don't rush it. If you find yourself getting frustrated or overwhelmed, take a break and come back in a couple of hours or the next day.
- **No direct technical support is offered.** There are several DIY forums and Facebook groups with thousands of members who enjoy troubleshooting and teaching. But please be sensitive to the fact that the staff at Aion FX is minimal, and every minute spent helping individuals in private is time that can't be spent on new project development.
- **There is no implied guarantee of a final product.** Aion FX provides the ingredients and the recipe, but you are responsible for putting everything together to make it work. We've tried to make the process as clear and accessible as possible, but it must be expressly stated that purchasing the kit is not a guarantee that you will end up with a working pedal.

It's recommended to read through all of the instructions before you start, particularly if you've never built a pedal before. If you familiarize yourself with the entire process ahead of time and you know what the goal looks like, each step will make more sense.

Now, on to the fun stuff!

PACKING LIST

This is a list of all the parts that are included with the kit, grouped by value. For a list of all the parts based on their PCB part numbers, please see page 24.

If you find that any parts are missing or damaged, please fill out the Missing Parts form.

Film Capacitors

NAME	QTY
2n2	2
4n7	1
10n (0.01)	1
15n (0.015)	1
22n (0.022)	2
47n (0.047)	1
100n (0.1 or “µ1J100”)	2
1uF	4

Electrolytic Capacitors

NAME	QTY
47uF	3
100uF	1

MLCC Capacitors

NAME	QTY
47pF (marked “470”)	1
100pF (marked “101”)	1
100n (marked “104”)	1

Diodes

NAME	QTY
1N5817	1
LED, 3mm green	1

Resistors

NAME	QTY
33R	1
1k	2
2k	1
2k7	1
5k1	1
10k	8
12k	1
20k	2
22k	1
100k	1
180k	1
360k	1
2M2	1

ICs

NAME	QTY
TL072	1
PT2399	1
8-pin socket	3
LM78L05 or MC78L05 (3-pin voltage regulator)	1

PACKING LIST (CONT.)

Potentiometers

NAME	QTY
50kB	3
10k trimmer potentiometer	1
Dust cover	3
Knob	3
Mounting nut, potentiometer, 0.44"	3
Lock washer, potentiometer, 0.5"	3
Outer washer, potentiometer, 0.475"	3

Other

NAME	QTY
LED bezel	1
LED, blue	1
9V battery snap	1
DC jack	1
Input/output jack	2
Mounting nut, jack, 0.54"	4
Outer washer, jack, 0.6"	2
Lock washer, jack, 0.5" (thin)	2
Enclosure	1
Enclosure screws	4
PCB, main circuit	1
PCB, footswitch	1
PCB, input/output/DC	1

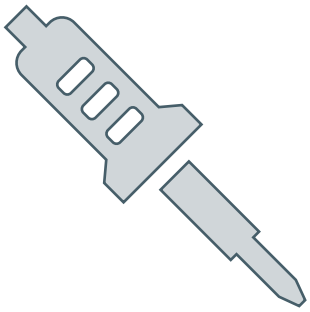
Switches

NAME	QTY
Stomp switch, 3PDT	1
Mounting nut, stomp switch, 0.6"	2
Lock washer, stomp switch, 0.6"	1
Dress nut, stomp switch, 0.77"	1

Wiring

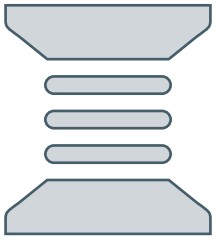
NAME	QTY
3-strand wire assembly, 70mm	2
4-strand wire assembly, 108mm	1
3-pin wire assembly header	2
4-pin wire assembly header	1

TOOLS NEEDED



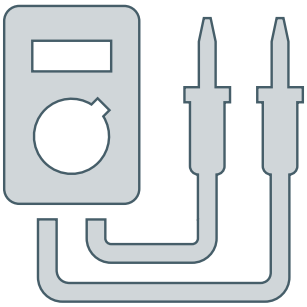
SOLDERING IRON

Temperature-adjustable is recommended. The optimum soldering temperature is 700-725° F (371-385° C) for leaded solder, or 750° F (400° C) for lead-free.



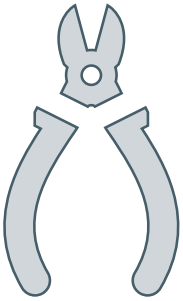
SOLDER

Preferably 63/37 or 60/40 leaded solder. Lead-free is more difficult to use, so if that's the only type you can get, it's best to watch tutorials that are specific to lead-free solder.



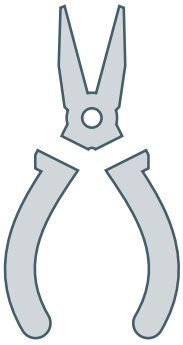
DIGITAL MULTIMETER (DMM)

Most cheap ones in the $10-30 range are fine for what we're doing. Make sure it has audible continuity testing (i.e. it beeps at the lowest resistance) and transistor hFE measurement.



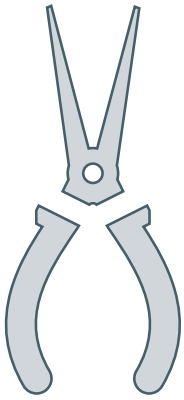
WIRE SNIPPERS

Also called nippers or wire cutters. The Hakko CHP-170 is the best you can get for less than $10.



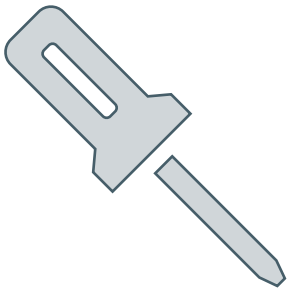
FLAT-NOSE PLIERS

Many general-purpose uses, but particularly tightening the nuts of pots, switches and jacks. Quicker than changing out sockets on a ratchet.



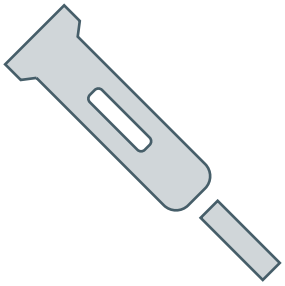
NEEDLE-NOSE PLIERS

These are used for bending leads on components and other general uses. Use the smaller type with a tip that's approximately 0.05" (1.25mm) wide.



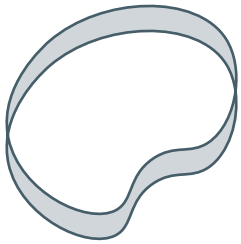
SCREWDRIVER (PHILLIPS)

Used for the enclosure screws. Get a powered driver if you'll be building a lot of pedals!



FLAT SCREWDRIVER (SMALL)

This is used for tightening the set screws on the knobs. The tip should be no more than 0.1" (2.5mm) wide.



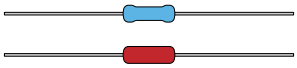
RUBBER BAND

Yes, a plain old rubber band. This is used to tighten the dress nut to avoid scratching or denting it (which can happen with metal tools).

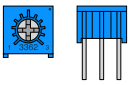
COMPONENT IDENTIFICATION

If you've never built a pedal before, you'll need to know what all the components are. These are shown actual size. (Not all of these types of components may be part of this kit.)

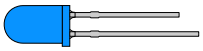
RESISTOR



TRIMMER POTENTIOMETER

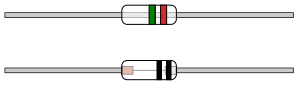


LED



SILICON DIODE

GERMANIUM DIODE



These are very fragile, so be careful when handling them.

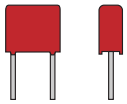
RECTIFIER DIODE

Some Schottky diodes also look like this.

SCHOTTKY DIODE

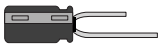
ZENER DIODE

FILM CAPACITOR



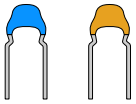
Not polarized. Color may vary by brand and type.

ELECTROLYTIC CAPACITOR



Polarized. The negative side is marked.

MLCC

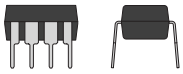


Not polarized. MLCC stands for "multi-layer ceramic capacitor."

TANTALUM CAPACITOR

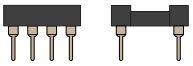
Polarized. The positive side is marked.

OP-AMP / IC

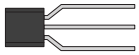


Charge pumps and delay chips also look like this. They may have more than 8 legs.

IC SOCKET



TRANSISTOR OR JFET



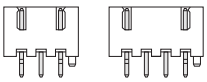
Some voltage regulators also look like this.

SNAP-APART SOCKET

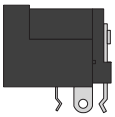
It's recommended to use a razor blade to separate these cleanly.

WIRE ASSEMBLY

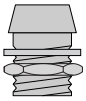
WIRE ASSEMBLY HEADER



DC JACK



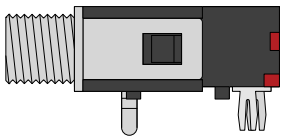
LED BEZEL



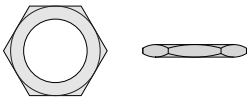
HARDWARE IDENTIFICATION

The hardware comes unassembled, so you'll need to sort & identify each of the pieces. The diagrams below are actual size, so you can set them against the printed page to identify them if needed.

I/O JACK

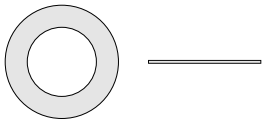


MOUNTING NUT



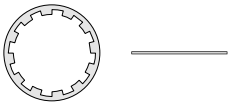
DIAMETER: 0.54" / 13.7mm

OUTER WASHER



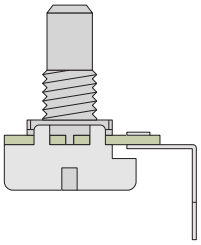
DIAMETER: 0.6" / 15.2mm

LOCK WASHER

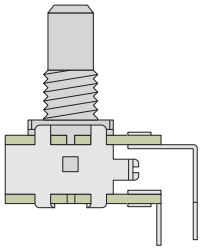


DIAMETER: 0.5" / 12.7mm

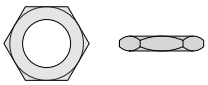
POTENTIOMETER (SINGLE)



POTENTIOMETER (DUAL)

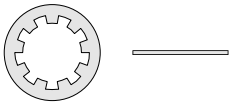


MOUNTING NUT



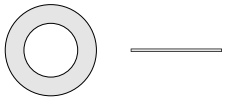
DIAMETER: 0.44" / 11.2mm

LOCK WASHER



DIAMETER: 0.5" / 12.7mm

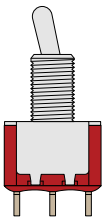
OUTER WASHER



DIAMETER: 0.475" / 12mm

KNOB

TOGGLE SWITCH



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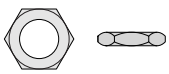
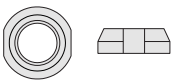


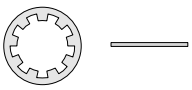
DIAMETER: 0.36" / 9.1mm

DRESS NUT



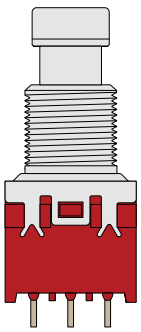
DIAMETER: 0.375" / 9.5mm

LOCK WASHER



DIAMETER: 0.4" / 10.1mm

FOOTSWITCH



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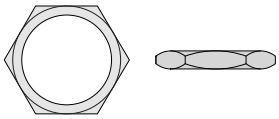
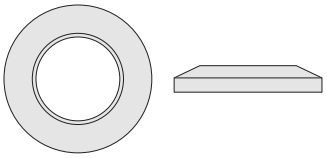


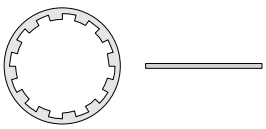
DIAMETER: 0.6" / 15.2mm

DRESS NUT



DIAMETER: 0.77" / 19.6mm

LOCK WASHER



DIAMETER: 0.6" / 15.2mm

PCB ASSEMBLY OVERVIEW

Now it's time to start building!

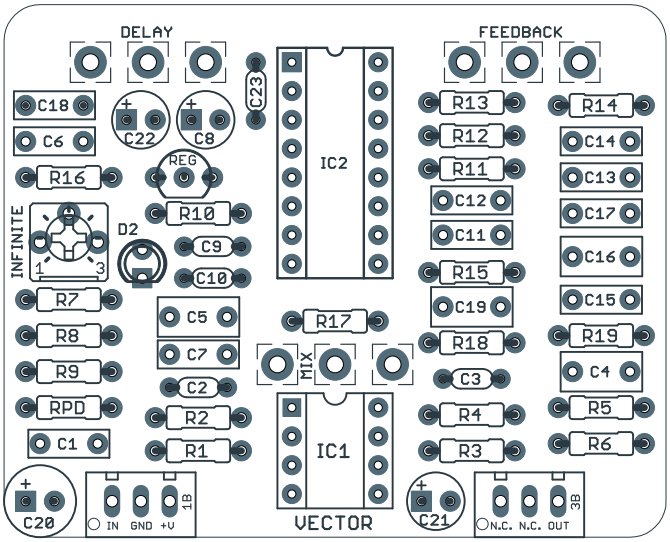
Before you begin, separate the PCBs into individual boards and break off the tabs from each using needle-nose or flat-head pliers. You should be left with the three PCBs shown to the right.

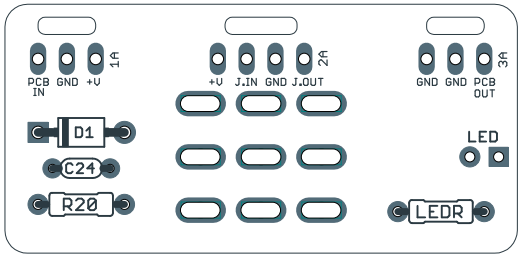
The general principle for PCB population is that you want to work in layers from shortest components (i.e. lowest-profile) to tallest. This way, when you turn the PCB upside down, the components are held in place when soldering.

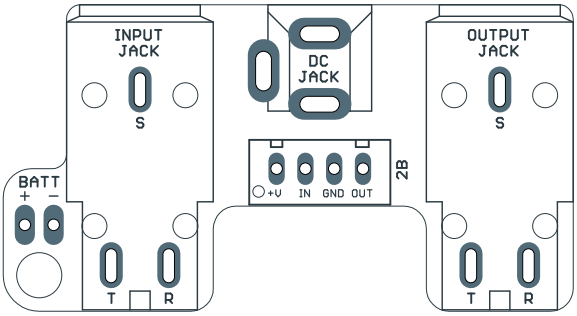
Generally speaking, you should populate the components in this order:

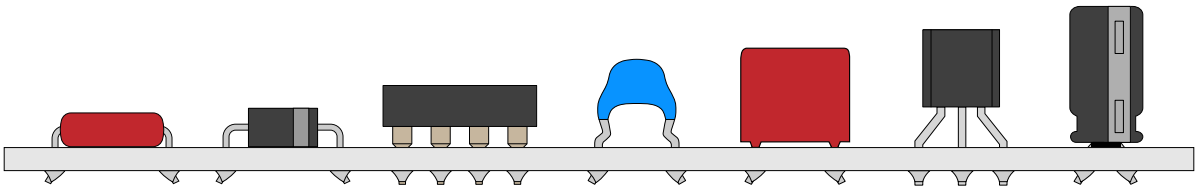
1. Resistors
2. Diodes
3. IC sockets
4. MLCC capacitors
5. Film capacitors
6. Transistors
7. Electrolytic capacitors

Not all of these component types are included in each kit, so skip them if they aren't applicable. Some types of film capacitors are taller than electrolytics, so those can be done last.







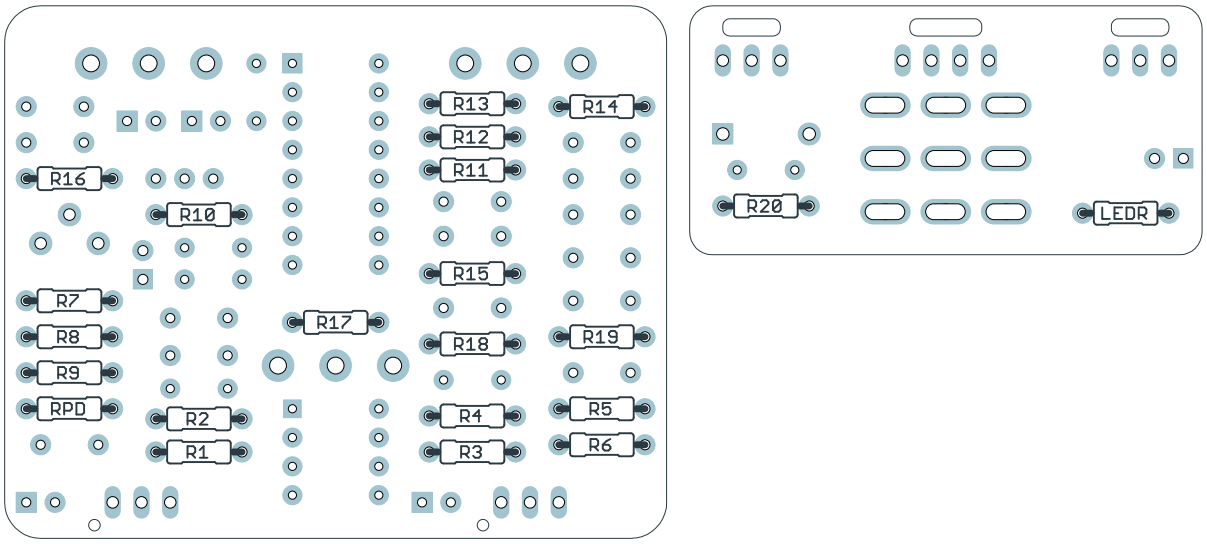


RESISTORS

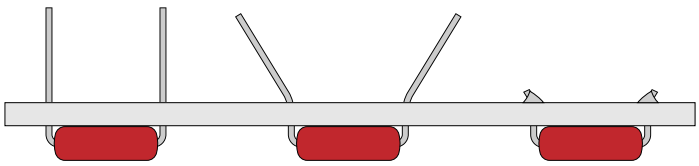
PART	VALUE
R1	180k
R2	360k
R3	22k
R4	12k
R5	1k
R6	100k
R7	10k
R8	10k

PART	VALUE
R9	10k
R10	2k7
R11	10k
R12	10k
R13	20k
R14	1k
R15	2k
R16	5k1

PART	VALUE
R17	20k
R18	10k
R19	10k
R20	33R
RPD	2M2
LEDR	10k



Using the parts list above, populate the resistors by pushing them through the holes and bending the leads outward at an angle to hold them in place. Resistors are not polarized, so they will work in any direction. Turn the board upside-down to keep the components held in place while you solder.



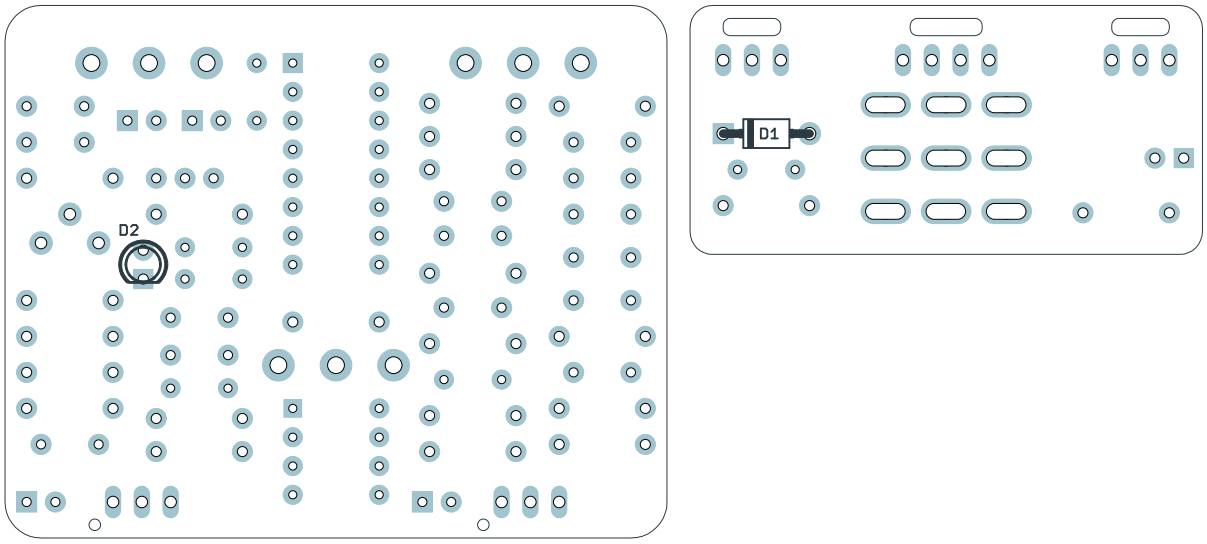
You'll use this same technique for most of the other components as well.

Don't try to do all of the resistors at once. You'll want to stop periodically flip the board and solder everything, then cut the leads using the wire snippers to make room for more. Generally you don't want to do more than 10 to 15 resistors at a time or the bottom of the board will get too crowded.

If this is your first time soldering, watch tutorial videos on YouTube and make sure you get it down before you begin. You don't want to practice or experiment on this board!

DIODES

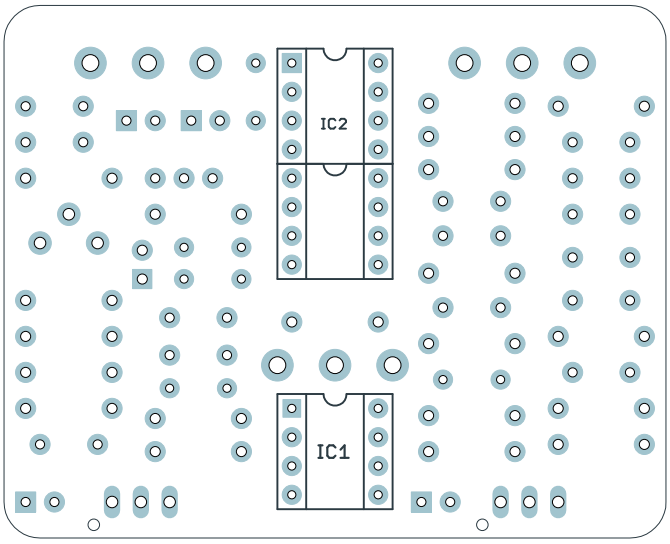
PART	VALUE
D1	1N5817
D2	3mm green



Next, you'll populate the diodes. Diodes are polarized, so make sure to identify the polarity band (which indicates the "cathode", or negative side) and match the band to the footprint on the PCB.

SOCKET & ICS

PART	VALUE
IC1	TL072
IC2	PT2399



Next up are the IC sockets. You can't bend the leads of the sockets like you can with the other components, so they won't stay in on their own until they are soldered.

Again, it's much easier to do all of these at once with gravity holding it in place for you, so you'll want do these before you do any of the taller components.

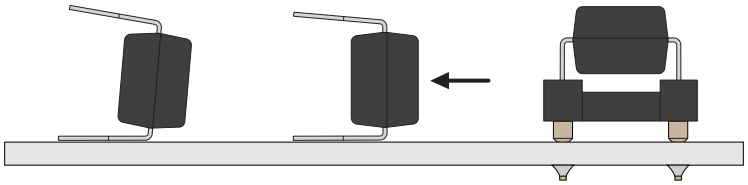
The PT2399 will use two adjacent 8-pin sockets rather than a single 16-pin socket.

Installing the ICs

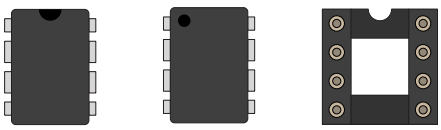
Don't insert the ICs into the sockets just yet. We will do this in a later step, after we've finished soldering the tallest components (the polarized capacitors). This information is just listed here for reference.

The legs of the ICs are bent outward slightly during manufacturing, so they'll need to be bent back inward before they can be inserted into the sockets.

It's easiest to do this by laying the IC legs against the table and bending the body itself so all four legs on the side are straightened out at once. Then, flip it and do the other side.

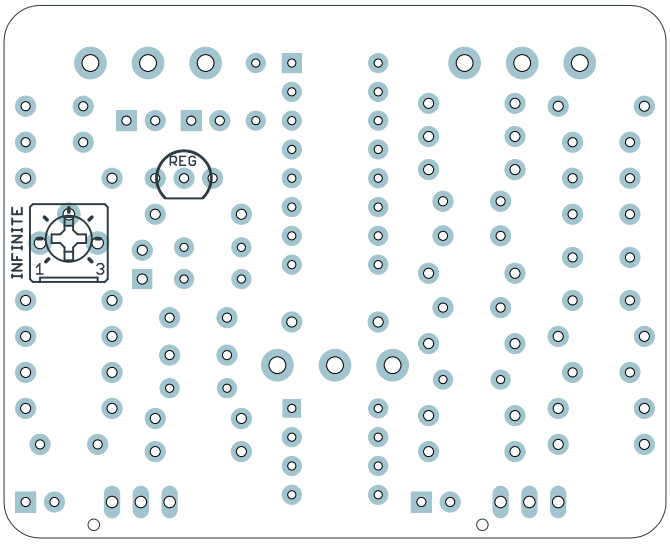


ICs may have two different orientation marks: either a dot in the upper-left or a half-circle notch in the middle of the top side. Some ICs have both marks. This shows which way the IC should be rotated when inserting it into a socket (the socket also has a half-circle notch).



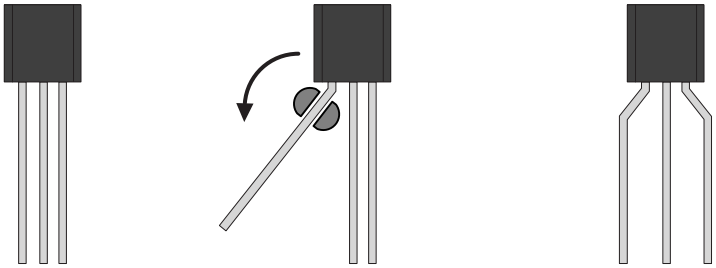
VOLTAGE REGULATOR & TRIMMER

PART	VALUE
REG	LM78L05 or MC78L05
INF	10k trimmer

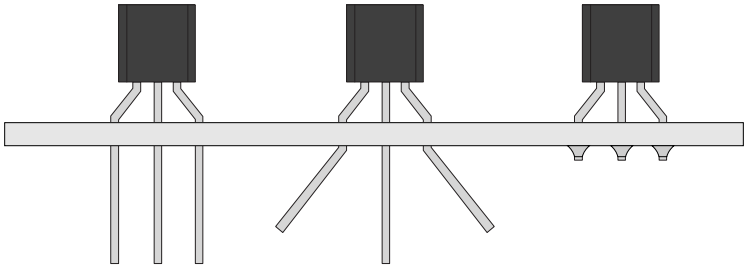


Now we'll do the voltage regulator (which looks like a transistor) and the "Infinite" trim potentiometer.

If the legs of the regulator are not already bent into 0.1" spacing, use your needle-nose pliers to bend the outer two legs as shown in the diagram below.



Bend the outer leads to hold it in place on the board. Then, solder them and clip the leads.



Setting the trimmer

The Infinite trimmer allows you to fine-tune the range of the Feedback knob so that at far ends of the rotation it can get into self-oscillation. Turn the trimmer to 50% (12:00 noon) as a starting point. After you've finished the build, turn the Feedback knob all the way up (clockwise) and adjust the Infinite trimmer until it oscillates to your taste.

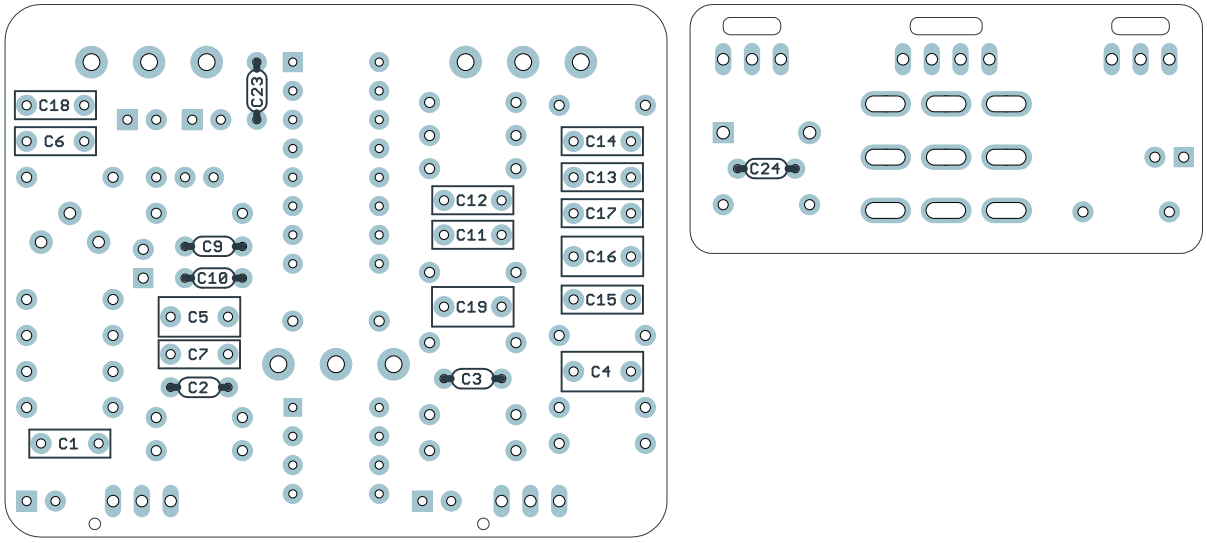
CAPACITORS (NON-POLARIZED)

PART	VALUE
C1	22n (0.022)
C2	47pF MLCC
C3	100pF MLCC
C4	1uF
C5	1uF
C6	4n7

PART	VALUE
C7	2n2
C9	100n MLCC
C10	100n MLCC
C11	100n (0.1)
C12	100n (0.1)
C13	15n (0.015)

PART	VALUE
C14	2n2
C15	10n (0.01)
C16	1uF
C17	47n (0.047)
C18	22n (0.022)
C19	1uF

PART	VALUE
C23	100n MLCC
C24	100n MLCC



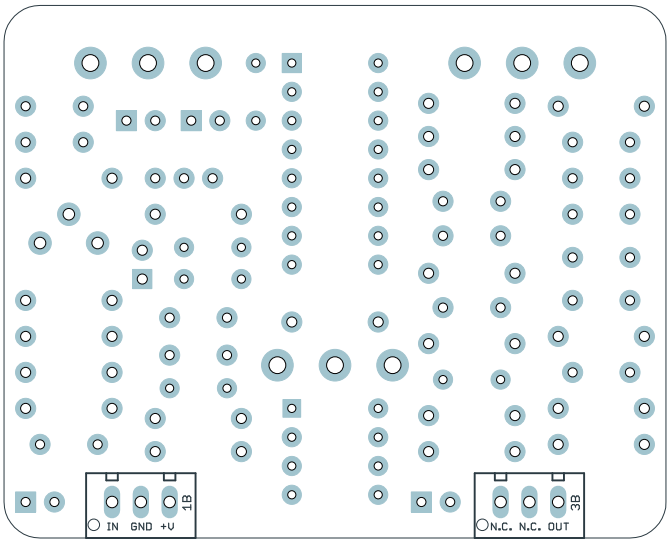
After the sockets come the box film and MLCC capacitors. These are all several different heights, but there aren't as many, so just do them all at once. Bend the leads at an angle to hold them in place.

MLCCs and box capacitors are not polarized and will work in any direction. To keep things neat, though, it's best to put them all facing the same way.

Note: For the film capacitors, that the value may be printed on either the top or the side. Typically the red ones will have the value printed on the side, while the blue ones will have the value printed on the top, with other unrelated information printed on the side.

C11 and C12 are usually red, but may read "µ1J100" on the top rather than the side.

WIRE HEADERS

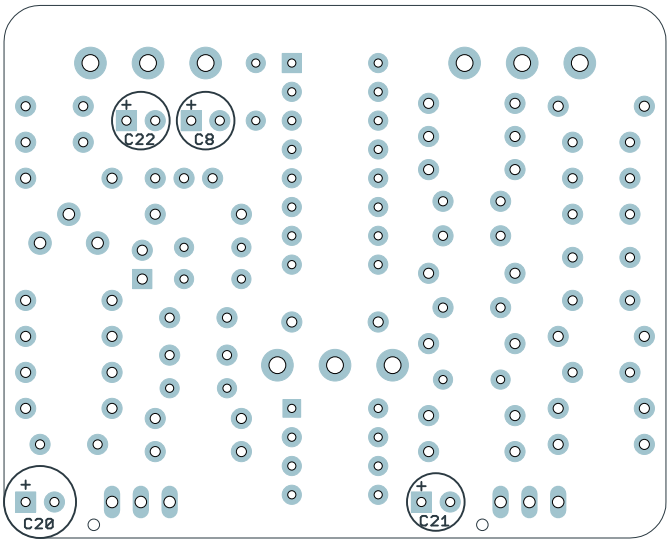


Install the two 3-pin headers (wire connectors) as shown above. These have a polarity pin, so as long as they are pressed all the way down, there's only one possible way to install them. They do fit pretty tightly in the holes, though, so press firmly.

There's also a 4-pin header on the I/O board that we will do in a later step.

CAPACITORS (POLARIZED)

PART	VALUE
C8	47uF
C20	100uF
C21	47uF
C22	47uF

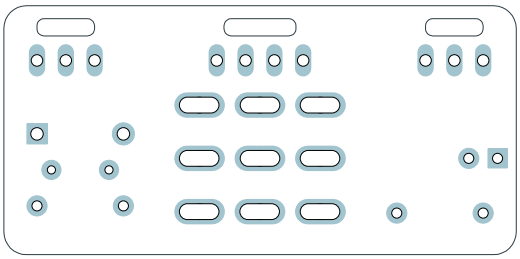


Populate the electrolytic capacitors. These are the tallest components so we save them for last. They are polarized (i.e. they will only work in one direction), so note the vertical mark that indicates the negative side. The longer leg is positive and fits in the square pad.

These are the last of the on-board components. Now is the time to go back to page 12 and insert the ICs into the sockets.

FOOTSWITCH PCB

PARTS
3-strand wire assembly (2)
4-strand wire assembly



Next, it's time to finish up the footswitch board. You should have done most of the on-board components on this board in a previous step, but if not, go back and do those.

There will be one longer assembly with 4 wires and two shorter ones with 3 wires. The longer one goes in the middle and the shorter ones go on the left and right sides. The wire assemblies should then be soldered to the footswitch board as shown.

STEP 1

First, thread the wire through the strain-relief slots, with the blue side facing outward and the PCB silkscreen facing up.

For now, pull it through as far as it can go.

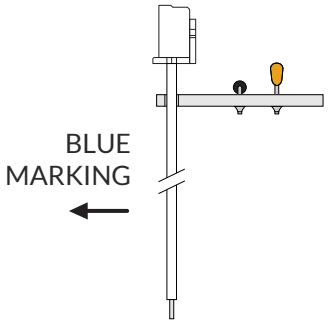
STEP 2

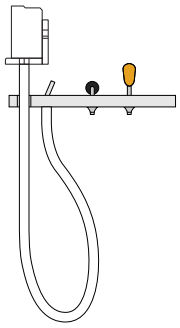
Next, bend the wires back upward and fit the ends of the wires into the solder pads.

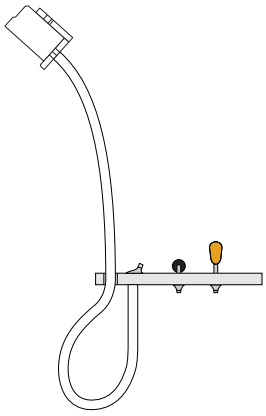
On the top side of the PCB, bend the exposed wires backward so it holds the wire in place. Pull the header back up through the slot partway.

STEP 3

Then, solder the wires from the top. This is the trickiest part of the whole build. You want to solder the pads without touching the iron to the wires themselves and risking burning through the insulation. It helps to use a sharp or narrow tip on the soldering iron.



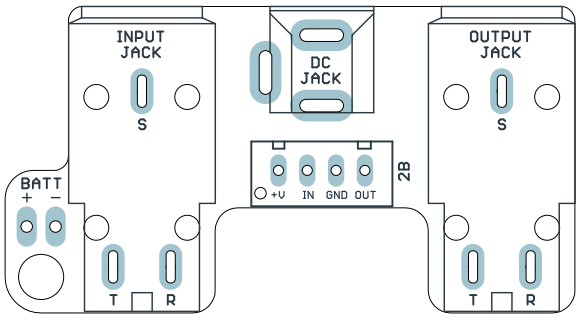




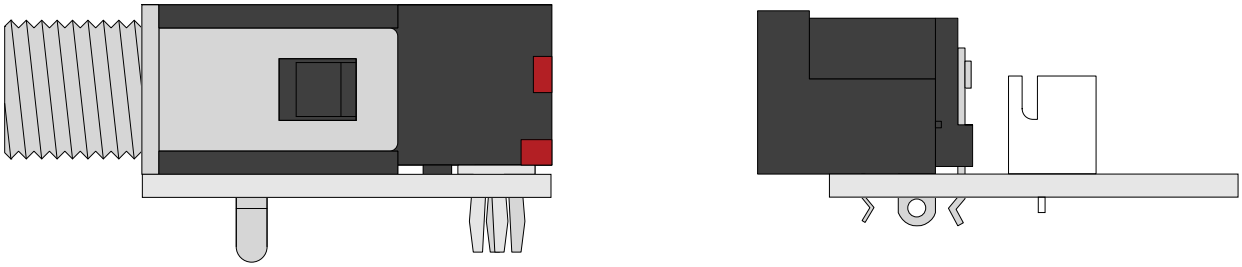
Once all three wire assemblies are soldered, set the footswitch PCB aside. We'll solder the actual footswitch and LED in a later step.

INPUT/OUTPUT PCB

PARTS
Input & output jacks
DC jack
Wire header
9V battery snap



Almost done! Get the two input/output jacks, the DC jack and the wire header and snap them in place. The PCB is designed for them to fit securely, so you can do them all at once before flipping and soldering.

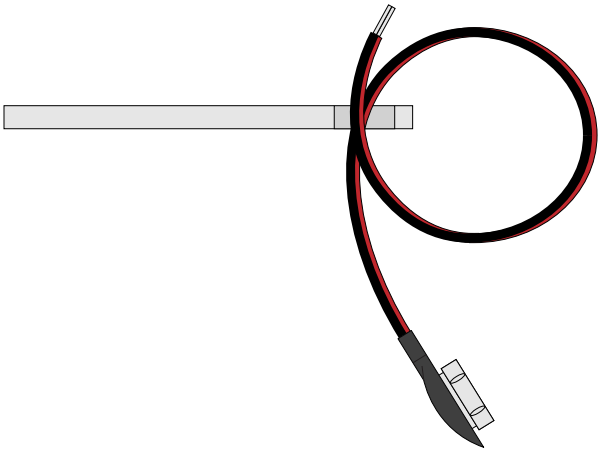


After you've soldered everything, make sure to **snip the leads on the I/O jacks as close as possible to the PCB**. There's not a lot of clearance between the bottom of this board and the top of the main PCB once everything is in place, and you don't want the pins to short against anything on accident.

Next, we'll hook up the 9V battery connector. **This is optional.** Not everyone uses batteries. But, if you do, this pedal should last a long time on a single 9V so you won't need to change it very often.

STEP 1

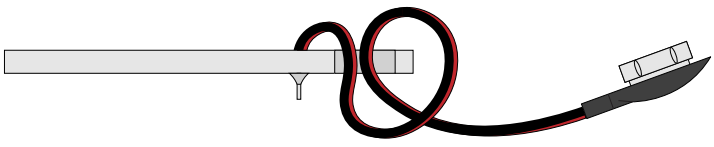
Thread the battery snap leads through the strain-relief hole twice so it forms a single loop.



STEP 2

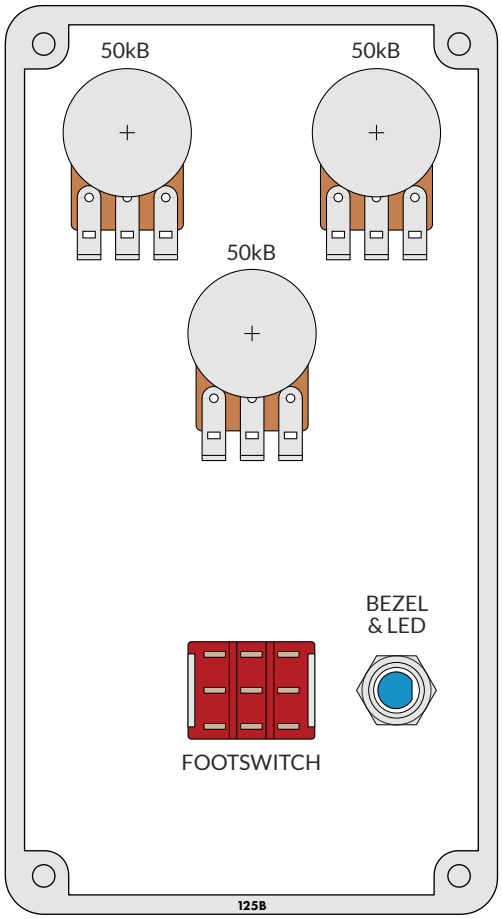
Bend the exposed wires back down and solder them into the pads. Red is positive (+), black is negative (-). After soldering, pull it tight.

For even more strain relief, you can thread the snap through the loop to form a knot. (not shown)

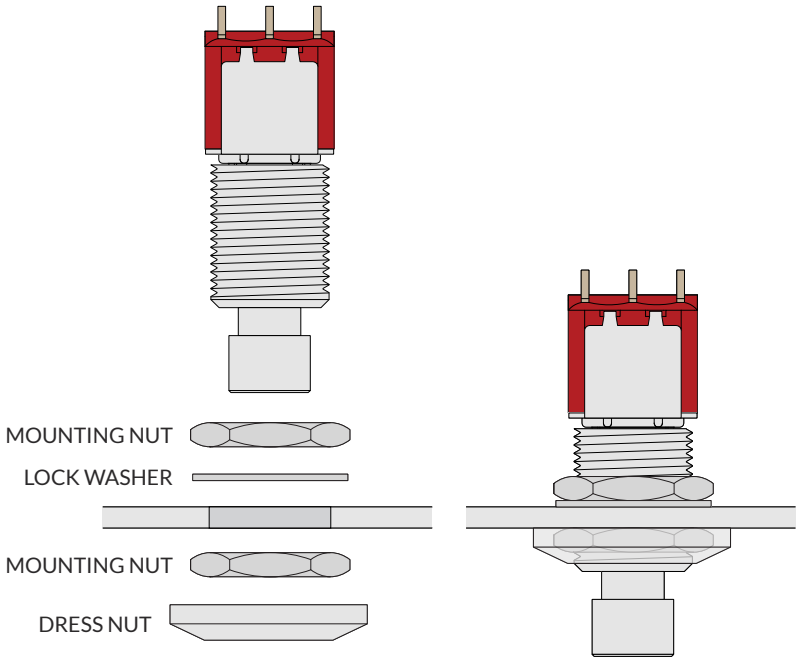


ENCLOSURE LAYOUT: PANEL MOUNTS

Attach the hardware to the enclosure as shown. (The I/O board is done in a later step.)



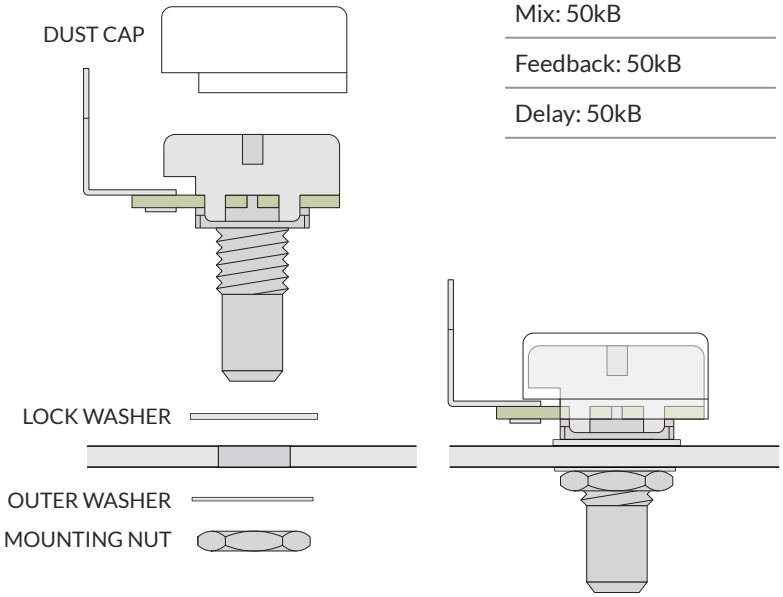
FOOTSWITCH



The dress nut fits over the top of the mounting nut and is for aesthetic purposes only. Wrap a rubber band around it to use as a grip when tightening. Do not use metal tools on it or you run the risk of scratching or denting it.

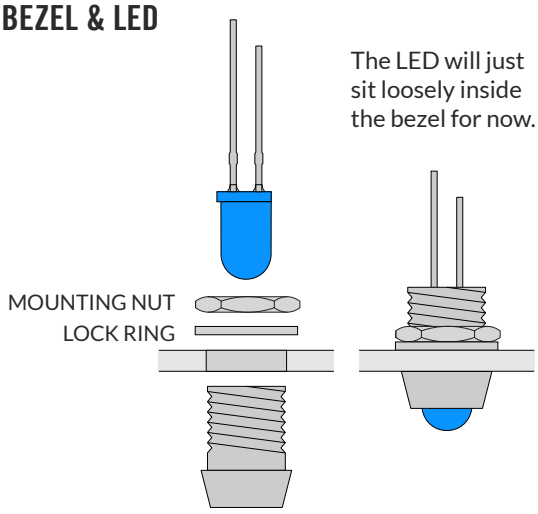
POTENTIOMETERS

Mix: 50kB
Feedback: 50kB
Delay: 50kB



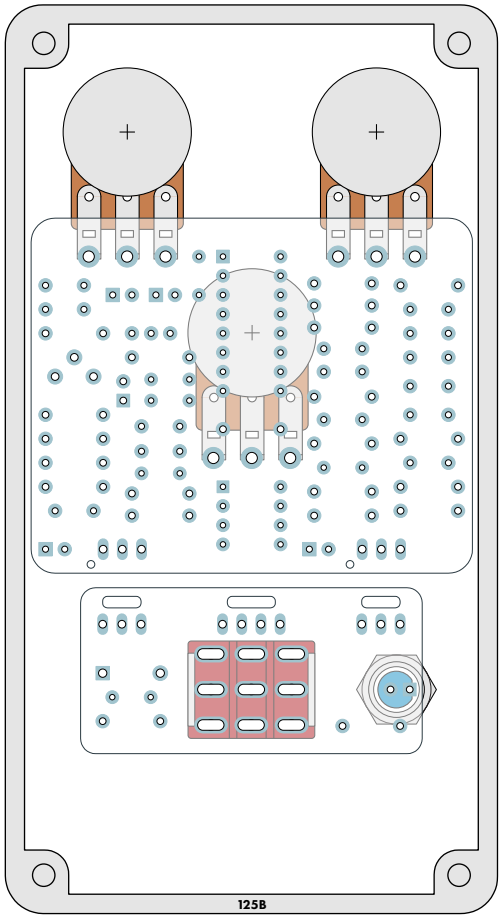
BEZEL & LED

The LED will just sit loosely inside the bezel for now.



You'll need to hold the bezel in place when tightening the nut. The top of the bezel is fairly sharp, so try using a rubber band for grip instead of pressing your finger against the bottom.

ENCLOSURE LAYOUT: MAIN & FOOTSWITCH PCBS



After all the components are affixed to the enclosure as shown on the previous page, place the main PCB on top of the potentiometers and toggle switches as in the diagram to the left.

You may need to adjust the position of the potentiometers and toggles slightly if they are not aligned straight.

Once all of the pins are through their holes and the PCB is laying flat, solder each of the pins from the top. Be careful not to touch any of the surrounding components with the soldering iron.

After you've finished soldering the pots, **clip the leads as close as you can to the main PCB**. This is more important with the two uppermost pots because the input/output PCB overlaps them and you need to avoid any of the components shorting. (The toggle switch lugs do not need to be clipped.)

Next, move to the footswitch board and solder the 3PDT switch.

The LED is last. Before soldering the LED, double-check to **make sure the flat side of the LED is facing to the right**, as shown in the diagram, and that the short leg is coming through the pad on the right. It won't work if it's turned the other way. Then, clip the leads of the LED.

Why solder everything inside the enclosure before testing it?

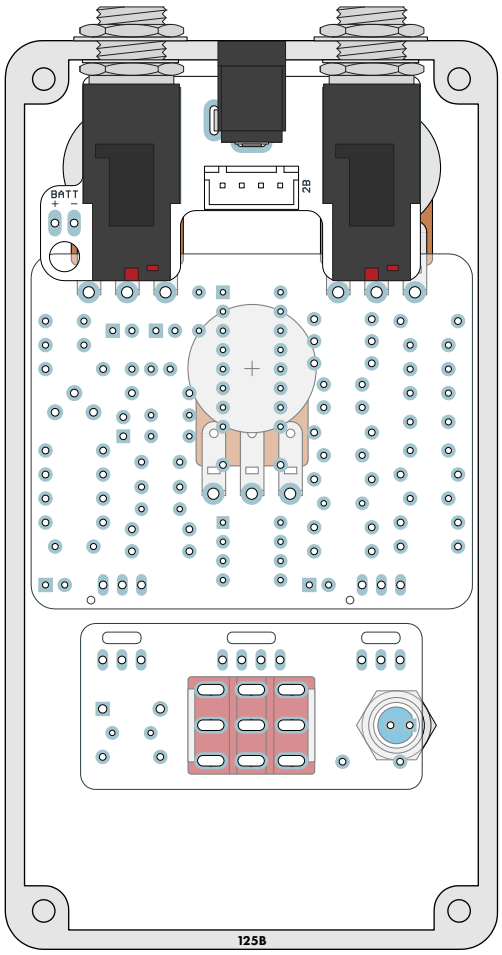
"Rock it before you box it" is conventional wisdom in pedalbuilding, and you'll often hear it recommended that builders should test the circuit before putting everything inside the enclosure. However, Aion FX projects are designed to be extremely easy to remove from the enclosure for troubleshooting, with no desoldering required—so with these kits, it's actually much easier to "box it before you rock it".

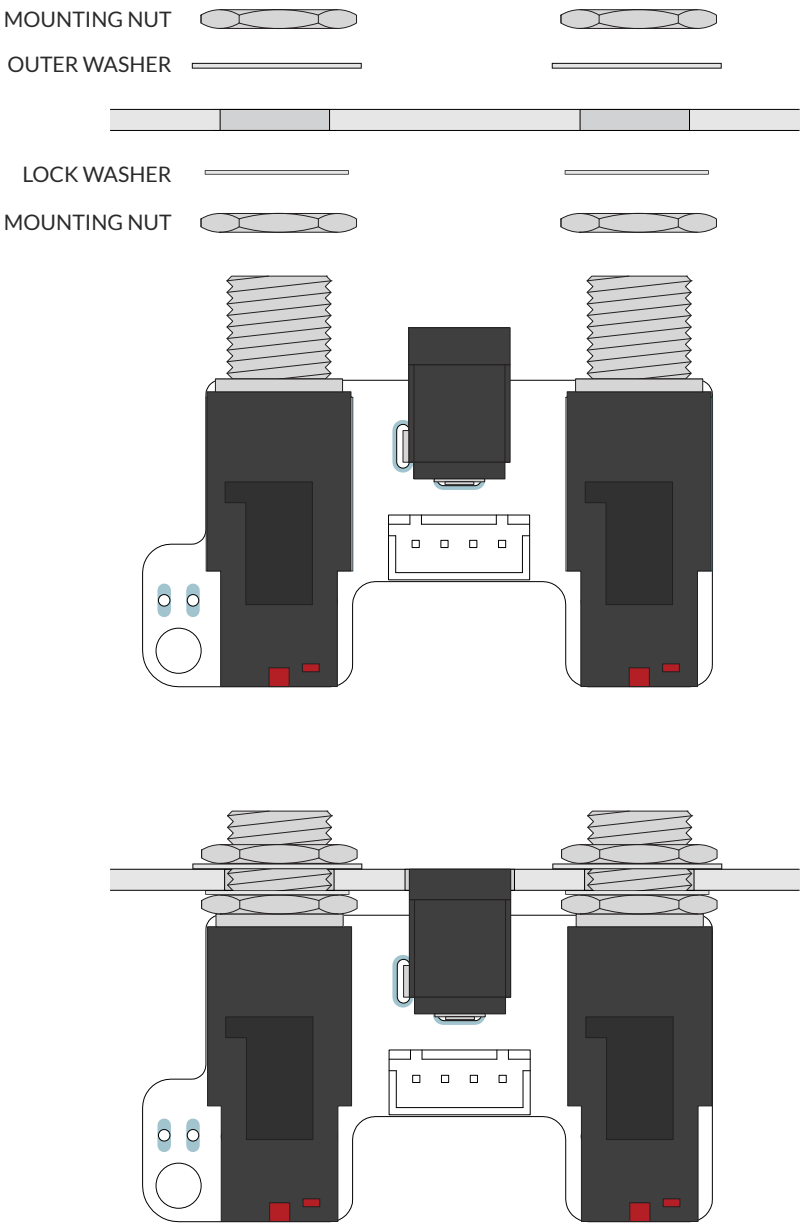
If you've read the documentation carefully and followed all the instructions, there's a good chance you will get it right the first time!

ENCLOSURE LAYOUT: INPUT/OUTPUT PCB

Affix the input/output PCB to the north-facing panel of the enclosure as shown.

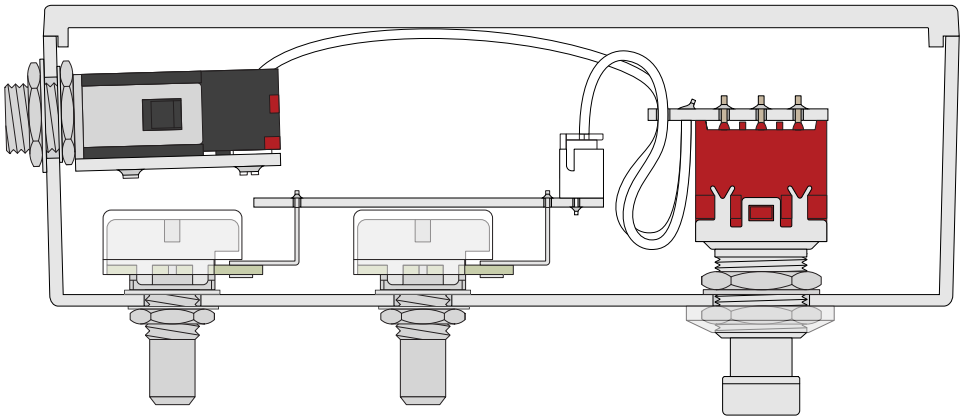
Note the use of two mounting nuts on each of the jacks, one inside and one outside. The inner nut acts as a spacer to set the DC jack flush with the outside of the enclosure. The inner nuts should be threaded as far down as they can go.





FINAL TESTING & ASSEMBLY

After everything is in place, just plug the 3 wire assemblies into their respective headers and make sure they're secure. Here is a cross-section of the inside of the completed pedal.



At this point, you have completed the full circuit as far as the electrons are concerned. Plug in a 9-volt supply and test it out with a guitar and an amplifier.

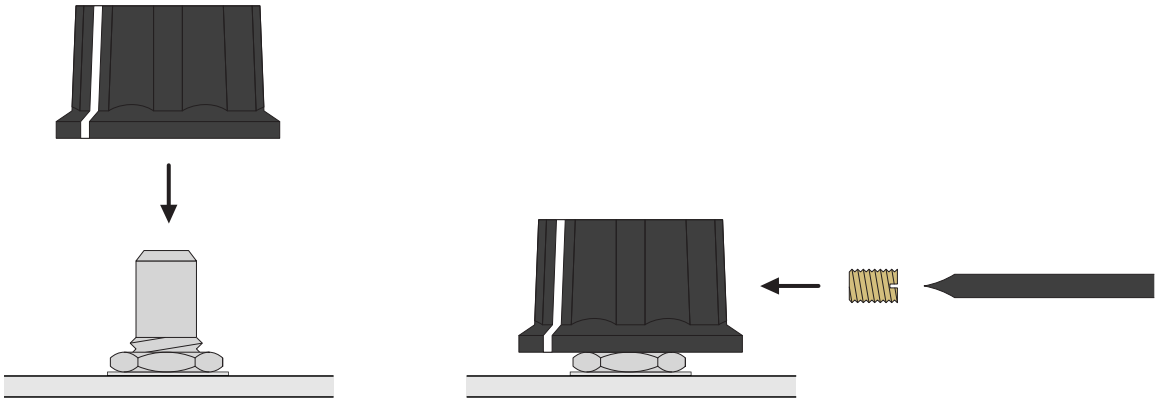
Test the bypass switch a few times, then start turning the knobs and see if everything sounds OK. If it works, great! If not, don't be discouraged. See page 26 for troubleshooting info.

Finishing touches

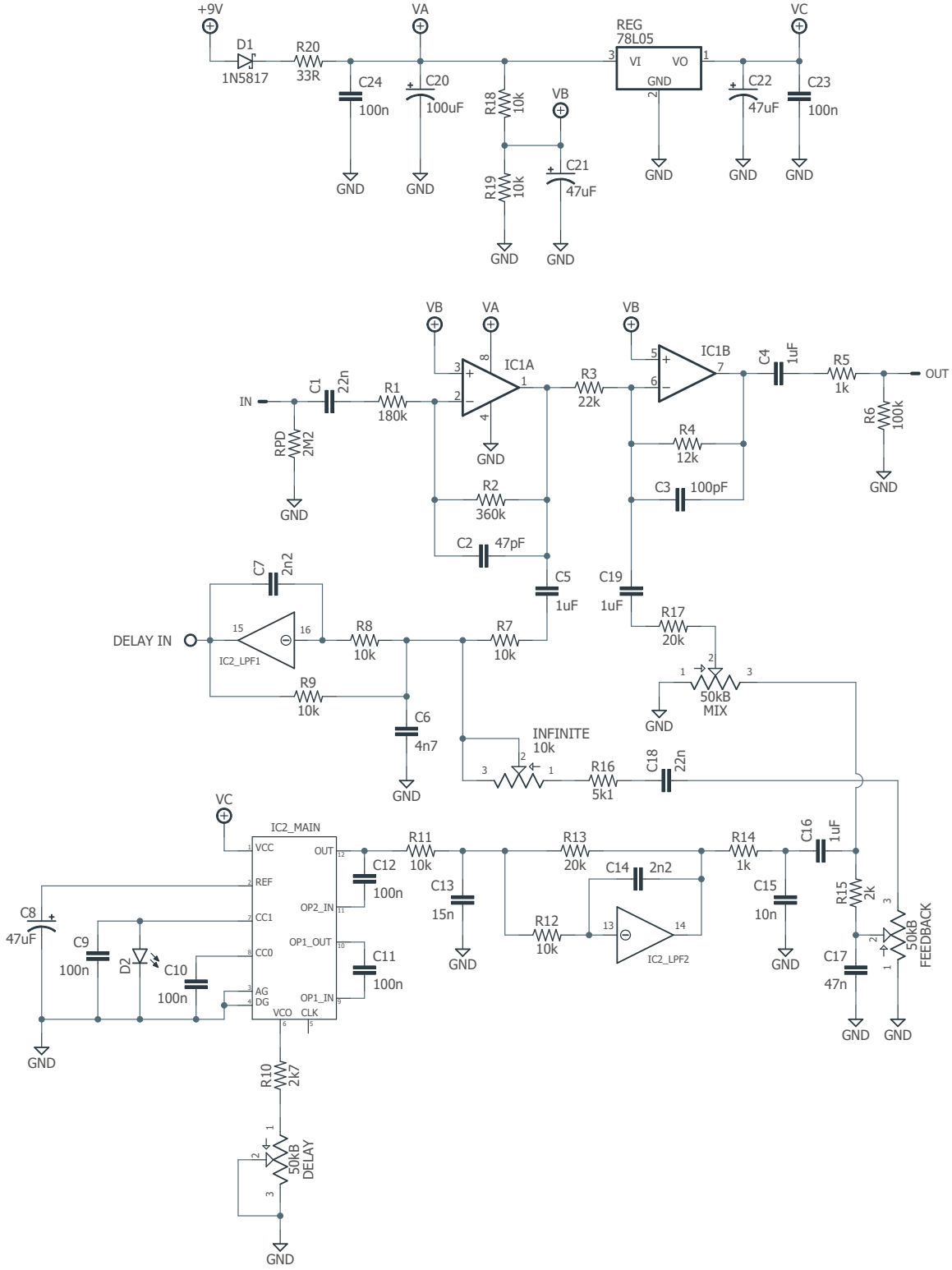
Now, just a couple of things for the final assembly. Turn the shafts all fully counter-clockwise, then put on the knob and rotate until the indicator line is aligned with the dot on the enclosure that shows the zero point. Affix the knobs to each of the potentiometer shafts as shown in the diagram below.

Using a small flat-head screwdriver (no more than 0.1" / 2.5mm in diameter), firmly tighten the set screw until it presses against the shaft of the potentiometer and holds the knob in place.

Be careful not to over-tighten or you may damage the set screw. But if it's not tight enough, the knob will be more likely to fall off or lose its alignment with the markings on the enclosure.



Last, just close the panel on the back using the four screws. That's it!


+9V
D1
1N5817
R20
33R
VA
C24
100n
C20
100uF
R18
10k
VB
C21
47uF
R19
10k
REG
78L05
VI
VO
GND
VC
C22
47uF
C23
100n
IN
C1
22n
R1
180k
RPD
2M2
IC1A
R2
360k
C2
47pF
R3
22k
IC1B
C4
1uF
R5
1k
OUT
R6
100k
R4
12k
C3
100pF
C5
1uF
C19
1uF
R17
20k
50kB
MIX
DELAY IN
C7
2n2
IC2_LPF1
R8
10k
R7
10k
R9
10k
C6
4n7
INFINITE
10k
R16
5k1
C18
22n
IC2_MAIN
VCC
REF
CC1
CC0
AG
DG
VCO
CLK
OUT
OP2_IN
OP1_OUT
OP1_IN
R11
10k
C12
100n
C13
15n
R13
20k
C14
2n2
R12
10k
IC2_LPF2
R14
1k
C16
1uF
C15
10n
R15
2k
50kB
FEEDBACK
C17
47n
C8
47uF
C9
100n
D2
C10
100n
C11
100n
R10
2k7
50kB
DELAY

FULL PARTS LIST

Resistors

PART	VALUE
R1	180k
R2	360k
R3	22k
R4	12k
R5	1k
R6	100k
R7	10k
R8	10k

PART	VALUE
R9	10k
R10	2k7
R11	10k
R12	10k
R13	20k
R14	1k
R15	2k
R16	5k1

PART	VALUE
R17	20k
R18	10k
R19	10k
R20	33R
RPD	2M2
LEDR	10k

Capacitors

PART	VALUE
C1	22n (0.022)
C2	47pF (470)
C3	100pF (101)
C4	1uF
C5	1uF
C6	4n7
C7	2n2
C8	47uF electro
C9	100n MLCC

PART	VALUE
C10	100n MLCC
C11	100n (0.1)
C12	100n (0.1)
C13	15n (0.015)
C14	2n2
C15	10n (0.01)
C16	1uF
C17	47n (0.047)
C18	22n (0.022)

PART	VALUE
C19	1uF
C20	100uF electro
C21	47uF electro
C22	47uF electro
C23	100n MLCC
C24	100n MLCC

Diodes

PART	VALUE
D1	1N5817
D2	LED, 3mm green

ICs

PART	VALUE
IC1	TL072
IC2	PT2399
REG	LM78L05 or MC78L05

Potentiometers

PART	VALUE
Delay	50kB
Feedback	50kB
Mix	50kB
Infinite	10k trim

Switches

PART
3PDT stomp

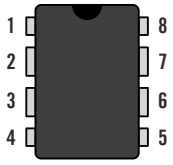
TROUBLESHOOTING INFORMATION

If you finish building the kit and find that it doesn't work right, we've written a separate in-depth Troubleshooting Guide that applies to all of our kits. The main troubleshooting process is covered there. Here you will find information specific to this kit that will help with that process.

Voltages

The following voltages are taken from our prototype unit using a **9.60V** supply. Your measured voltages won't be exactly the same due to variance in power supplies and component tolerances. However, if you see anything more than +/-0.5V from the listed voltages, it's a good indicator of an issue, and the exact voltages can help narrow it down.

Note that IC pins are labeled counter-clockwise from the upper-left, as shown in the diagram to the right. For the regulator (REG), the pins are labeled 1-2-3 left to right.



IC1

PIN	VOLTAGE
1	4.30
2	4.31
3	4.30
4	0
5	4.30
6	4.31
7	4.31
8	8.61

IC2

PIN	VOLTAGE
1	5.08
2	2.54
3	0
4	0
5	3.25
6	2.47 *(delay min)* 2.54 *(delay max)*
7	0.70
8	0.72

PIN	VOLTAGE
9	2.54
10	2.54
11	2.54
12	2.54
13	2.54
14	2.54
15	2.54
16	2.54

REG

PIN	VOLTAGE
1	8.61
2	0
3	5.08

SUPPORT

Aion FX does not offer direct support for these projects beyond the provided documentation. Replacements and refunds cannot be offered unless it can be shown that the circuit or documentation are in error or that the included components are non-functional.

Where to get help

The three best places to ask for help are the DIY Stompboxes forum, the DIY Stompboxes Facebook group, and the r/diypedals subreddit. These communities have more than 150,000 members between them and they are very accommodating to new builders.

When posting a troubleshooting request, always include the following:

1. A thorough description of the problem you are experiencing
2. A photo of the inside of the pedal
3. A list of all the measured voltages of each of the pins, described on the previous page

While we cannot offer direct, private support, you may send a link to your public troubleshooting thread to Aion FX using the contact form on the website. There is no guarantee that we will be able to join the discussion and help solve your problem, but this improves the chances.

It benefits the whole community if the troubleshooting process is public because then people who have the same issue in the future may come across it when searching. And if you do get help, remember to pay it forward! The best way to learn new skills is to help others. Even if you've only built one pedal, you have more experience than someone who is brand new, so you have something to offer.

RESALE TERMS

These kits may be used for commercial endeavors in any quantity unless otherwise noted. It's okay to sell individual builds locally or online, or even to offer a service to build pedals based on these kits.

No direct attribution is necessary, though a link back is always greatly appreciated. The only usage restriction is that you cannot "goop" the PCB or otherwise obscure the source. In other words: you don't have to go out of your way to advertise the fact that you use Aion FX kits, but please don't go out of your way to hide it. The guitar effects industry needs more transparency, not less!

LEGAL INFORMATION

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These kits are intended to be built by the customer. Aion FX is not responsible for language that may be used by the customer in the marketing or resale of the finished product.

DOCUMENT REVISIONS

1.0.3 (2024-08-08)
Added link to troubleshooting guide on page 25.

1.0.2 (2023-11-23)
Updated LEDR (LED current-limiting resistor) to 10k to reduce brightness.

1.0.1 (2022-07-01)
Added MC78L05 as an alternate for REG (normally LM78L05).

1.0.0 (2019-07-04)
Initial release.