PROJECT NAME

FLARE

aion
DIY GUITAR EFFECTS

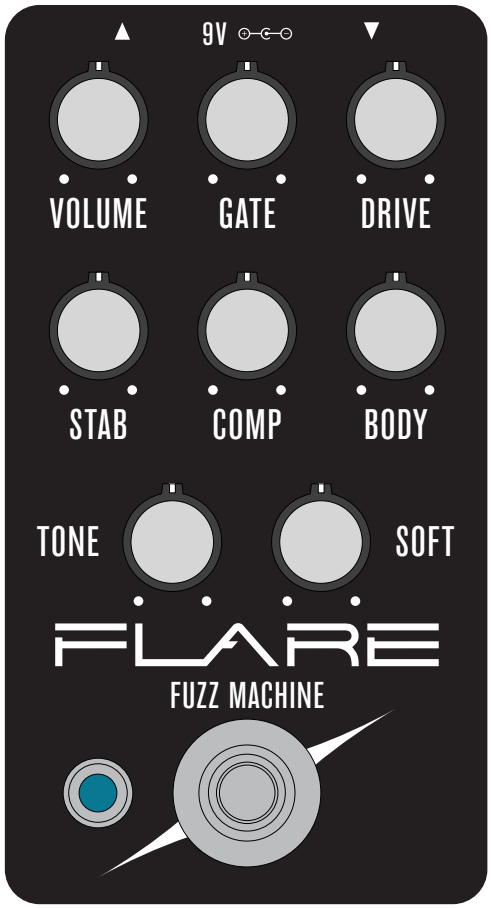
BASED ON
ZVEX Fuzz Factory™

BUILD DIFFICULTY
Intermediate

EFFECT TYPE
Fuzz

DOCUMENT VERSION
1.0.2 (2024-08-08)

PROJECT SUMMARY
A glitchy silicon/germanium hybrid fuzz known for its dizzying array of controls and untamed sounds.



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 25.

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

Film Capacitors

NAME	QTY
10n (0.01)	1
18n (0.018)	1

Electrolytic Capacitors

NAME	QTY
10uF	4
100uF	2

MLCC Capacitors

NAME	QTY
100n (marked “104”)	1

Diodes

NAME	QTY
1N5817	1

Resistors

NAME	QTY
100R	1
470R	1
5k1	1
10k	2
47k	1
120k or 121k	1
220k	1
2M2	1

Transistors

NAME	QTY
2N3904	1
Transistors, germanium, matched for Fuzz Factory	2

PACKING LIST (CONT.)

Potentiometers

NAME	QTY
5kB	1
10kB	5
100kB	2
Dust cover	8
Knob, 1/2”	8
Mounting nut, potentiometer, 0.44"	8
Lock washer, potentiometer, 0.5"	8
Outer washer, potentiometer, 0.475"	8

Other

NAME	QTY
LED bezel	1
LED, blue	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

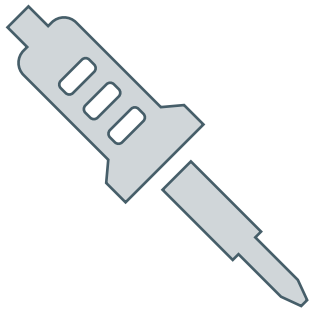
Switches

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

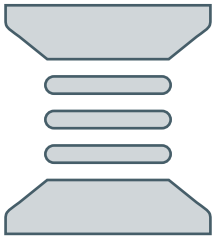
NAME	QTY
3-strand wire assembly, 70mm	2
4-strand wire assembly, 122mm	1
3-pin wire assembly header	2
4-pin wire assembly header	1

TOOLS NEEDED



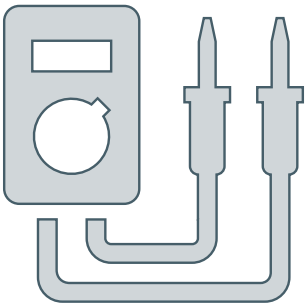
SOLDERING IRON

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.



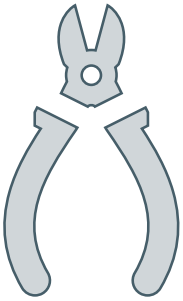
SOLDER

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.



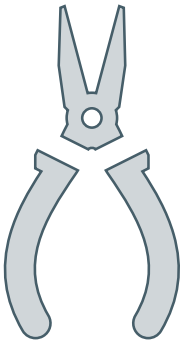
DIGITAL MULTIMETER (DMM)

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.



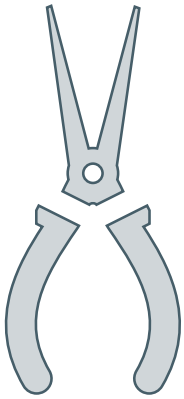
WIRE SNIPPERS

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



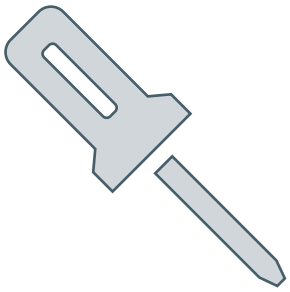
FLAT-NOSE PLIERS

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



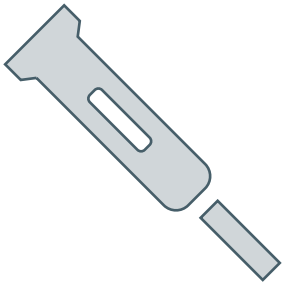
NEEDLE-NOSE PLIERS

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.



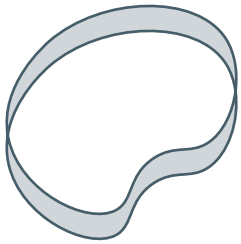
SCREWDRIVER (PHILLIPS)

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.



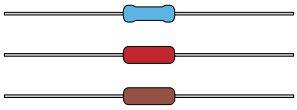
RUBBER BAND

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).

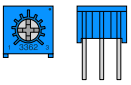
COMPONENT IDENTIFICATION

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.)

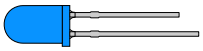
RESISTOR



TRIMMER POTENTIOMETER

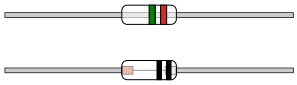


LED



SILICON DIODE

GERMANIUM DIODE



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

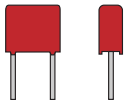
RECTIFIER DIODE

Some Schottky diodes also look like this.

SCHOTTKY DIODE

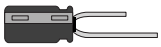
ZENER DIODE

FILM CAPACITOR



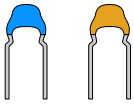
Not polarized. Color may vary by brand and type.

ELECTROLYTIC CAPACITOR



Polarized. The negative side is marked.

MLCC

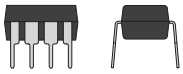


Not polarized. MLCC stands for "multi-layer ceramic capacitor."

TANTALUM CAPACITOR

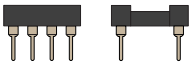
Polarized. The positive side is marked.

OP-AMP / IC

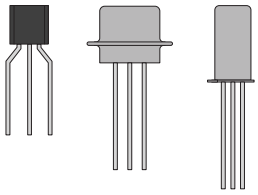


Charge pumps and delay chips also look like this. They may have more than 8 legs.

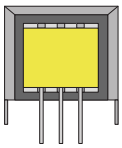
IC SOCKET



TRANSISTOR OR JFET

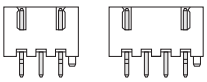


TRANSFORMER

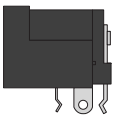


WIRE ASSEMBLY

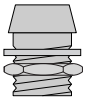
WIRE ASSEMBLY HEADER



DC JACK



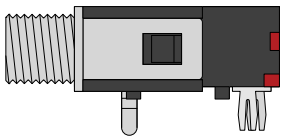
LED BEZEL



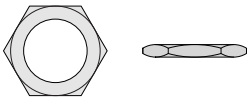
HARDWARE IDENTIFICATION

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

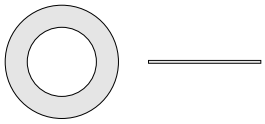


MOUNTING NUT



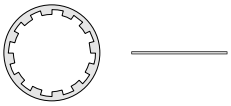
DIAMETER: 0.54" / 13.7mm

OUTER WASHER



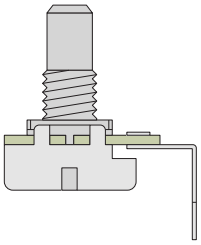
DIAMETER: 0.6" / 15.2mm

LOCK WASHER

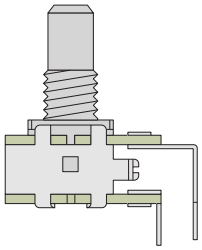


DIAMETER: 0.5" / 12.7mm

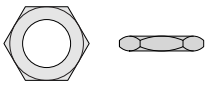
POTENTIOMETER (SINGLE)



POTENTIOMETER (DUAL)

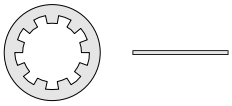


MOUNTING NUT



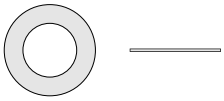
DIAMETER: 0.44" / 11.2mm

LOCK WASHER



DIAMETER: 0.5" / 12.7mm

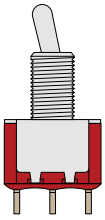
OUTER WASHER



DIAMETER: 0.475" / 12mm

KNOB

TOGGLE SWITCH



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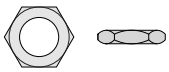
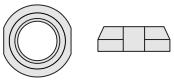


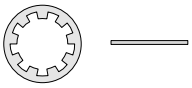
DIAMETER: 0.36" / 9.1mm

DRESS NUT



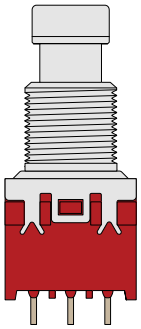
DIAMETER: 0.375" / 9.5mm

LOCK WASHER

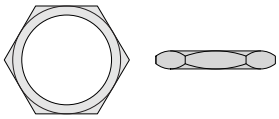


DIAMETER: 0.4" / 10.1mm

FOOTSWITCH

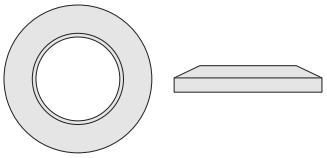


MOUNTING NUT



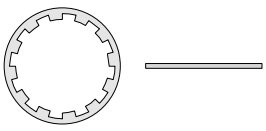
DIAMETER: 0.6" / 15.2mm

DRESS NUT



DIAMETER: 0.77" / 19.6mm

LOCK WASHER



DIAMETER: 0.6" / 15.2mm

PCB ASSEMBLY OVERVIEW

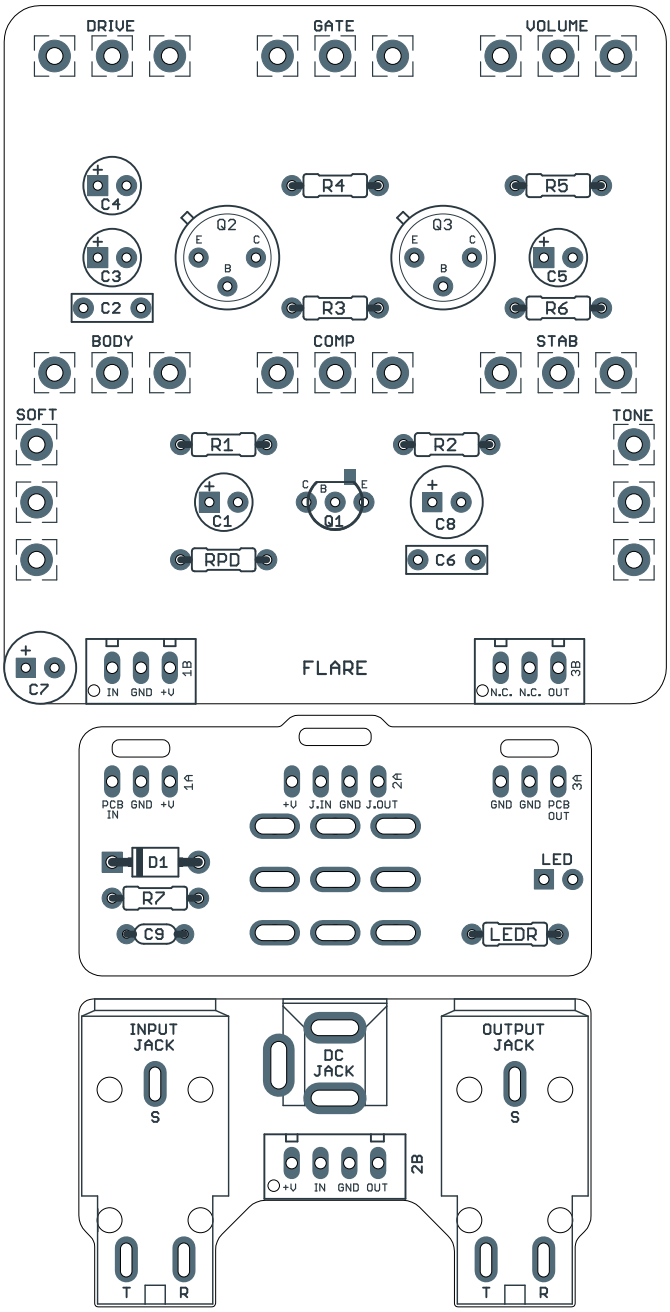
Now it's time to start building!

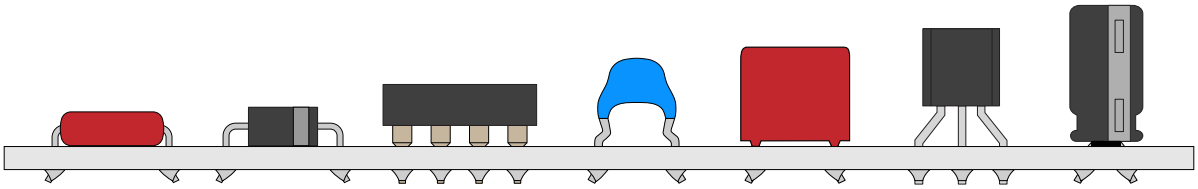
The first thing you need to do is snap apart the PCBs into 3 separate boards (if needed) and break off the tabs from each using needle-nose or flat-head pliers. You should be left with the PCBs shown to the right.

The general principle for PCB population is that you want to work in layers from shortest components (i.e. lowest-profile) to tallest so that when the PCB is upside-down, everything is making contact with the work surface and is held in place.

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

1. Resistors
2. Diodes
3. MLCC capacitors
4. Film capacitors
5. Transistors (silicon)
6. Electrolytic capacitors
7. Transistors (germanium)



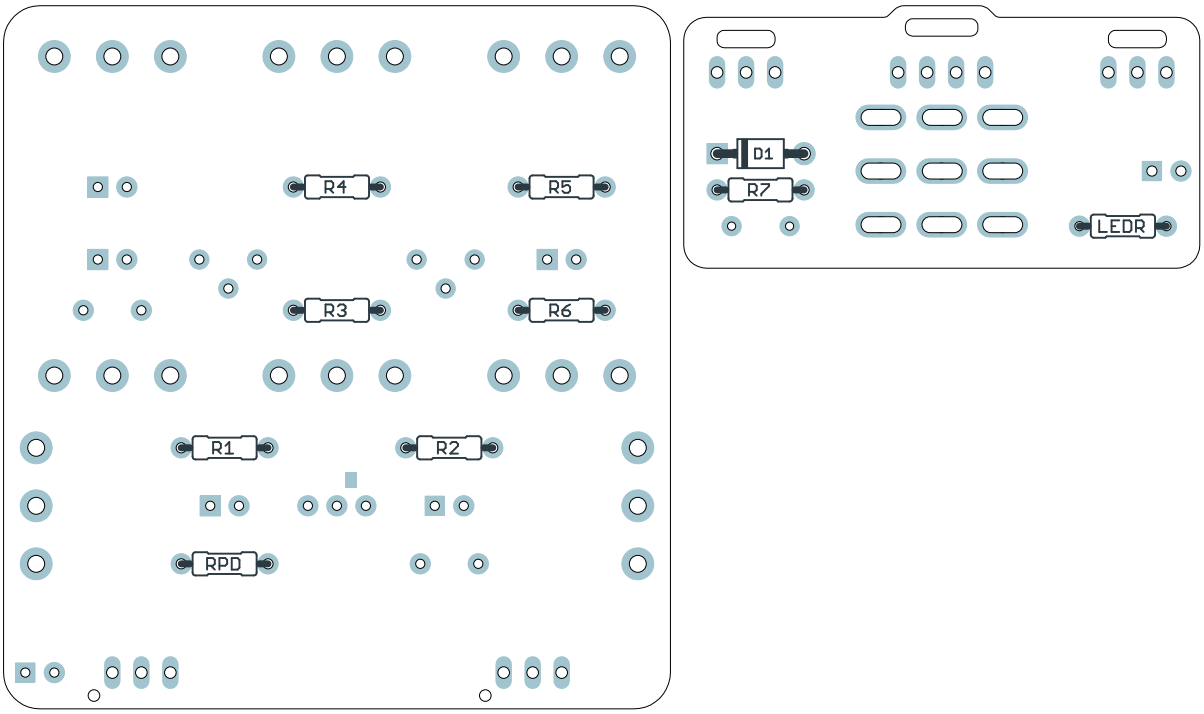


RESISTORS & DIODE

PART	VALUE
R1	120k or 121k
R2	10k
R3	47k
R4	470R
R5	5k1

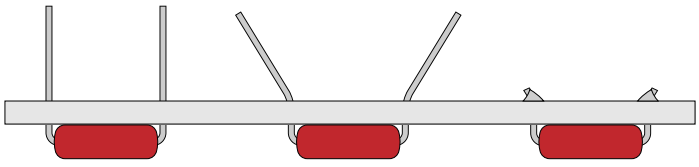
PART	VALUE
R6	220k
R7	100R
RPD	2M2
LEDR	10k
D1	1N5817

Note: *R1 may be either a red 120k resistor or a brown 121k resistor depending on availability. In this position, the 1% difference in value won't have any impact on the circuit.*



Using the parts list above, populate the resistors and diode 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, but note that the diode is polarized and must be installed with the silver band lining up with the band on the PCB silkscreen.

Turn the board upside-down to keep the components held in place while you solder.

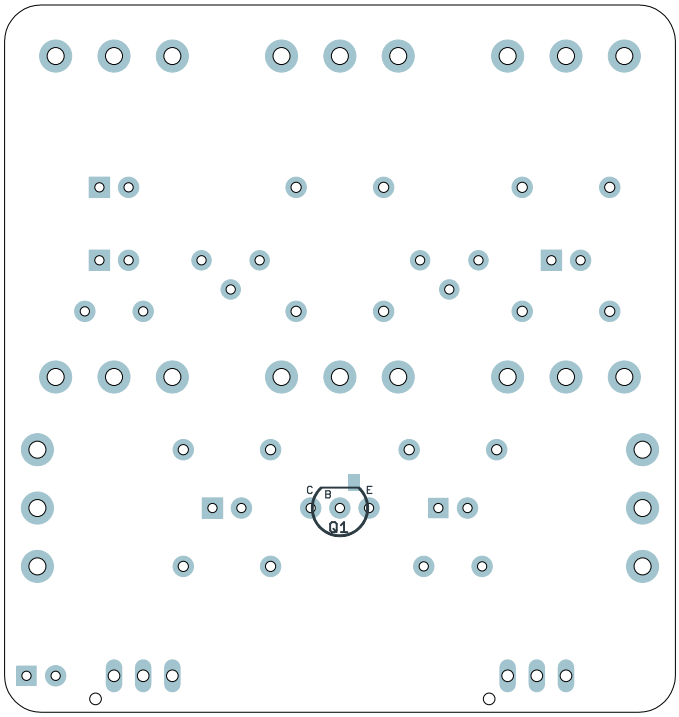


You'll use this same technique for most of the other components as well.

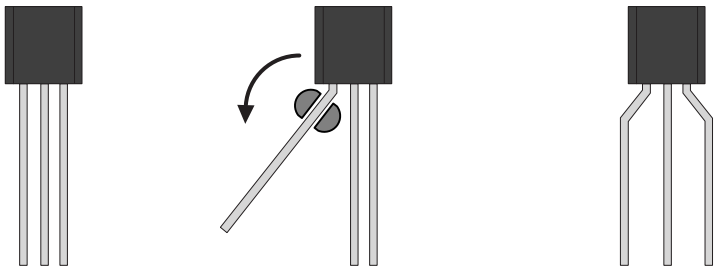
If this is your first time soldering, watch tutorial videos on YouTube and make sure you get it down before you begin. You don't want to practice or experiment on this board!

SILICON TRANSISTOR

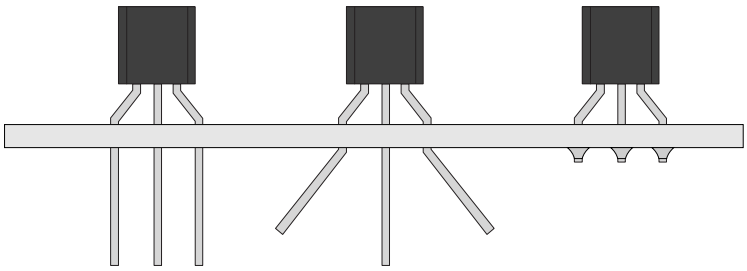
PART	VALUE
Q1	2N3904



Now we'll do the silicon transistor. If the legs are not already bent into 0.1" spacing, use your needle-nose pliers to bend the outer two legs as shown.

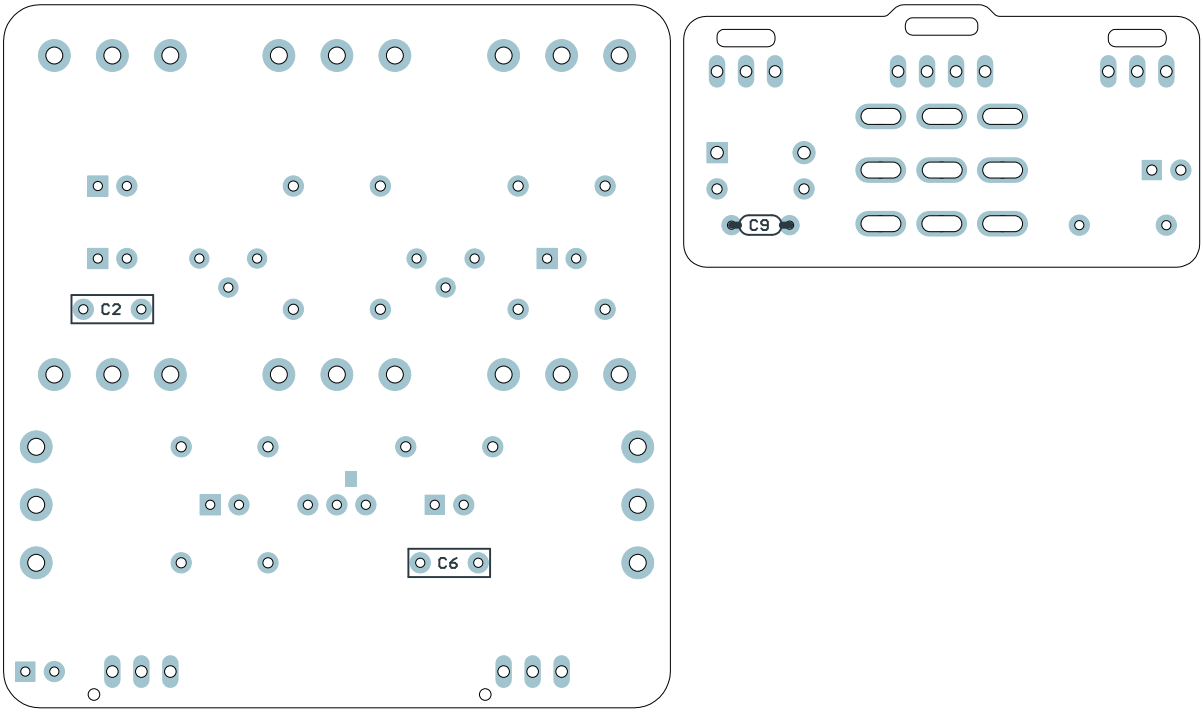


Bend the outer leads of the transistor to hold it in place on the board. Then, solder it and clip the leads.



CAPACITORS (NON-POLARIZED)

PART	VALUE
C2	10n (0.01)
C6	18n (0.018)
C9	100n MLCC

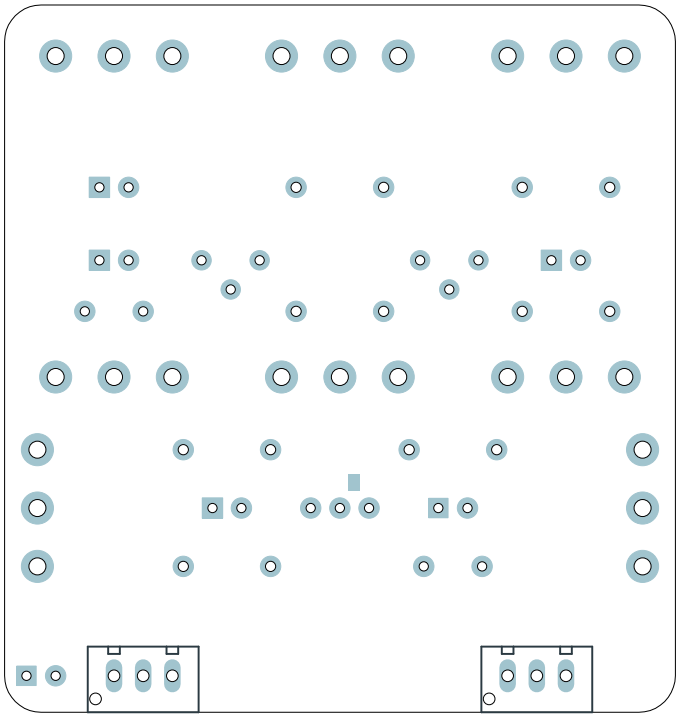


After the silicon transistor come the box film and MLCC capacitors. As with previous components, bend the leads at an angle to hold them in place.

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 so the values can easily be read.

Note: C2 is sometimes a blue box film capacitor and C6 is sometimes gray. These capacitors have the value printed on the top, while the more common red capacitors have the value on the side. The text on the side of the blue and gray capacitors is not related to the value and can be ignored.

WIRE HEADERS

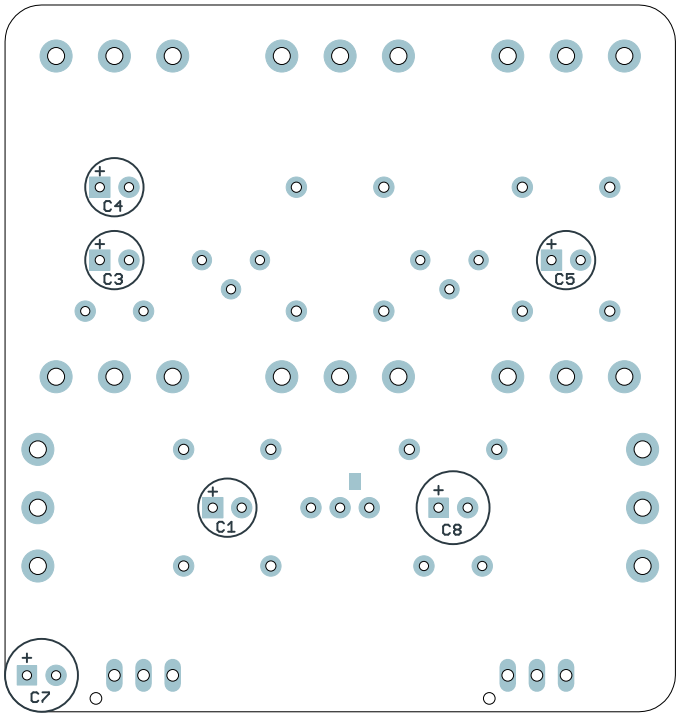


Install the two 3-pin headers (wire connectors) as shown above. These have a polarity pin, so as long as they are pressed all the way down, there's only one possible way to install them. They do fit pretty tightly in the holes, though, so press firmly.

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

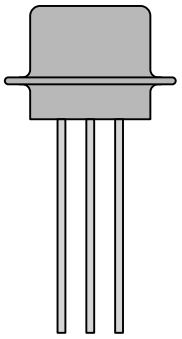
CAPACITORS (POLARIZED)

PART	VALUE
C1	10uF
C3	10uF
C4	10uF
C5	10uF
C7	100uF
C8	100uF



Populate the electrolytic capacitors. 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.

GERMANIUM TRANSISTORS: INTRODUCTION



Next are the germanium transistors. These are very different than modern electronic components, so they need an introduction before we cover how to install them.

Silicon vs. germanium

Compared to silicon, germanium transistors are imprecise and inconsistent, even among the same part number. As a result, when classic fuzz circuits use germanium transistors, it's not the part number that's important, but the specifications of the individual device. Two transistors of different part numbers with identical gain and leakage will sound exactly the same. Conversely, not all transistors of the same part number will work in a particular circuit.

Because of this, be aware that this kit may include any of several different part numbers. In this document we will refer to them as Q2 and Q3, not by specific part numbers such as AC125 or МП16Б.

Matching

The transistors included in the Flare kit have been measured and matched for best performance in the Fuzz Factory circuit. The transistors come in two bags stapled together, and each bag has two numbers written on it that are used for the matching process.

It's not necessary for you to understand what these numbers mean, but if you're curious, the top number is the gain (h_{FE}) and the bottom number is the leakage current in microamps (μA). All you need to know for a successful build is that the transistor in the front is **Q2** and has a lower gain value. The second transistor is **Q3** and has a gain value approximately 40 to 60% higher than Q2.

It is extremely important that the transistors are not removed from the bags until it's time to install them, and only one at a time, to avoid inadvertently mixing them up. They are not visually distinguishable from each other, and outside of the bags there is no way to tell which is which. The pedal may not sound right if the transistors are used in the wrong positions.

Temperature sensitivity

Germanium is a delicate semiconductor material and very sensitive to overheating. If the transistor is overheated, it could be permanently damaged. It's recommended to mount the transistors so they are elevated above the PCB by about 3/8" (9.5mm) to allow some of the heat to dissipate before it reaches the body of the transistor. If it takes longer than two seconds for the solder to form a good joint, move to a different component and let the transistor cool a bit before trying again.

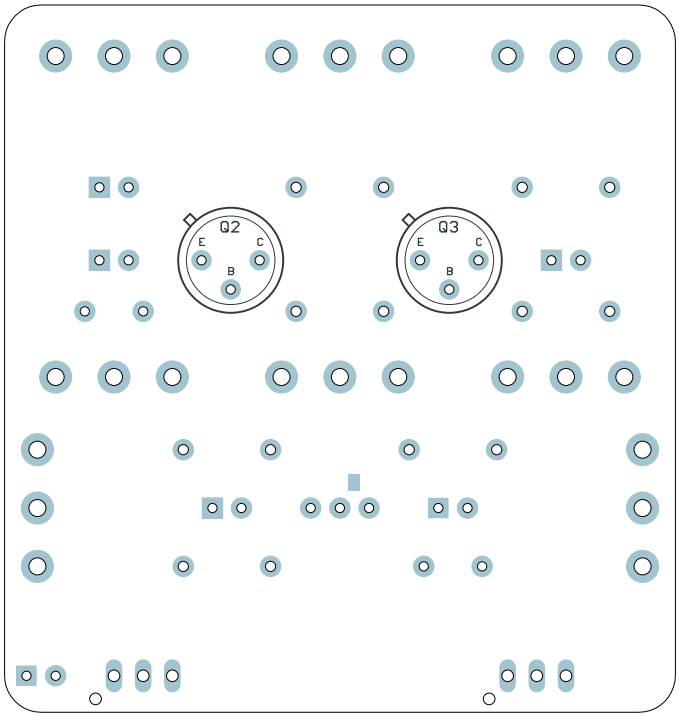
Old-stock precautions

Germanium transistors are not manufactured today except for some expensive industry-specific applications, so nearly all of the germanium transistors used in guitar pedals are old-stock. The transistors in this kit are at least 30 years old, and sometimes 50 or more.

While age has nothing to do with performance of the device itself, the leads may be corroded and solder may not adhere well unless they are cleaned first. If you notice any corrosion on the leads, use medium-grit sandpaper or a fine metal file to remove it, and ensure the leads are shiny before soldering.

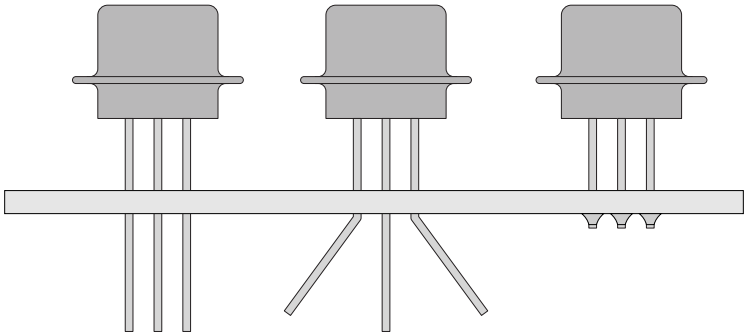
GERMANIUM TRANSISTORS

PART	VALUE
Q2	Germanium
Q3	Germanium



Now that we've covered the basics of germanium transistors, it's time to install them. Remove Q2 (the front transistor with a lower gain value) from the bag. As mentioned on the previous page, it's important to leave Q3 in its bag until Q2 has been soldered so they don't get mixed up.

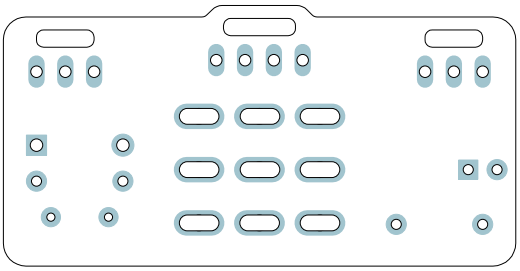
Insert it into the pads on the PCB, being mindful of the "V" pattern of the pins. Keep it raised about 3/8" (9.5mm) above the PCB, then bend the legs on the bottom side to keep it attached. Turn the PCB over and let it hang down while you solder it in place. Be quick and make sure the transistor casing doesn't get too hot or the transistor could be damaged.



Now, repeat the same step with Q3, the one labeled with the higher gain value.

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's previously-installed components facing up.

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

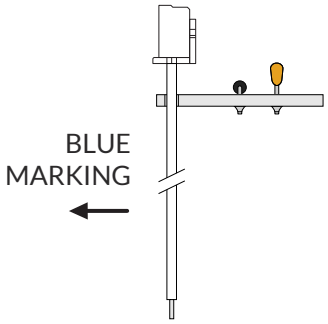
STEP 2

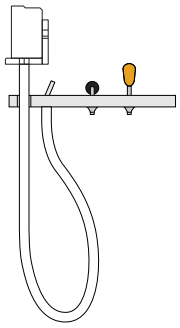
Next, bend the wires back upward and fit the ends of the wires into the solder pads.

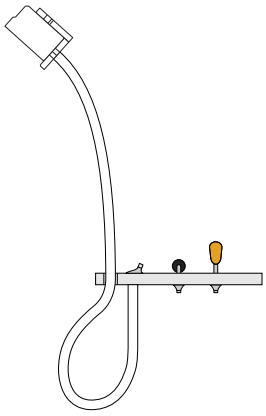
On the top side of the PCB, bend the exposed wires backward so it holds the wire in place. Pull the header back up through the slot partway.

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.



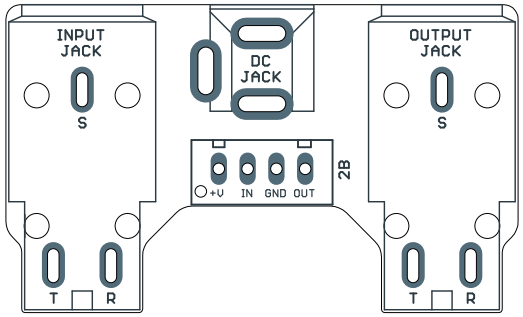




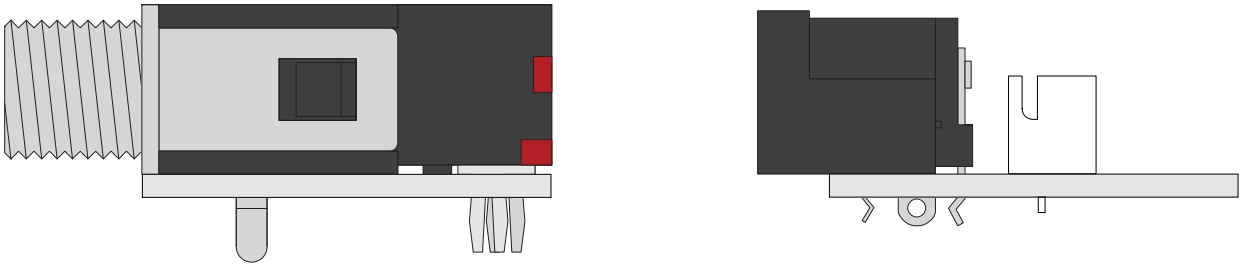
Once all three wire assemblies are soldered, set the footswitch PCB aside. We'll solder the actual footswitch and LED in a later step.

INPUT/OUTPUT PCB

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



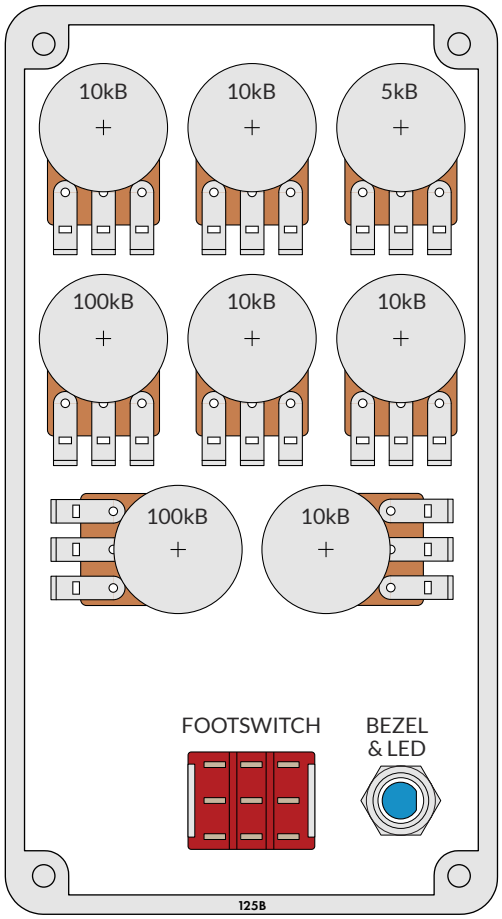
Almost done! Get the two input/output jacks, the DC jack and the wire header and snap them in place. The PCB is designed for them to fit securely, so you can do them all at once before flipping and soldering.



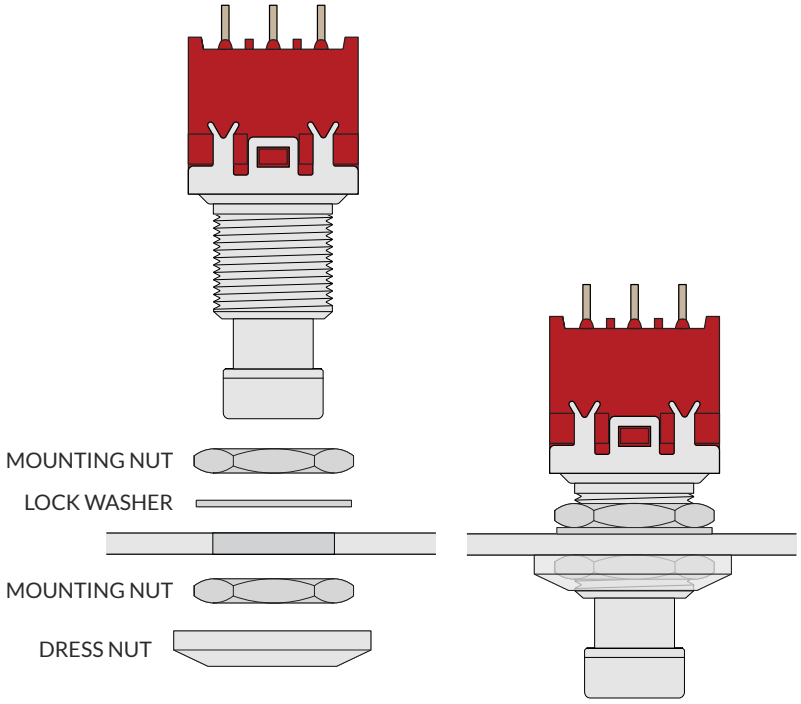
After you've soldered everything, make sure to **snip the leads on the I/O jacks as close as possible to the PCB**. There's not a lot of clearance between the bottom of this board and the top of the main PCB once everything is in place, and you don't want the pins to short against anything on accident.

ENCLOSURE LAYOUT: PANEL MOUNTS

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

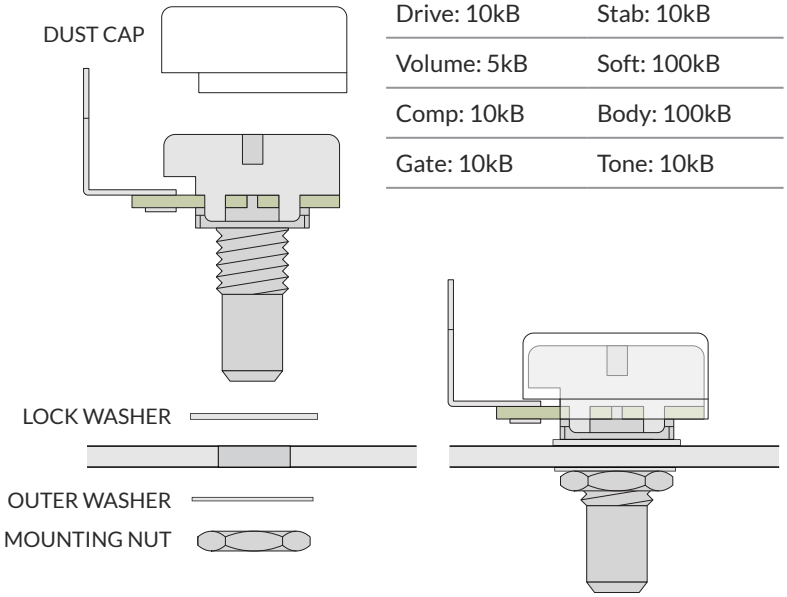


FOOTSWITCH



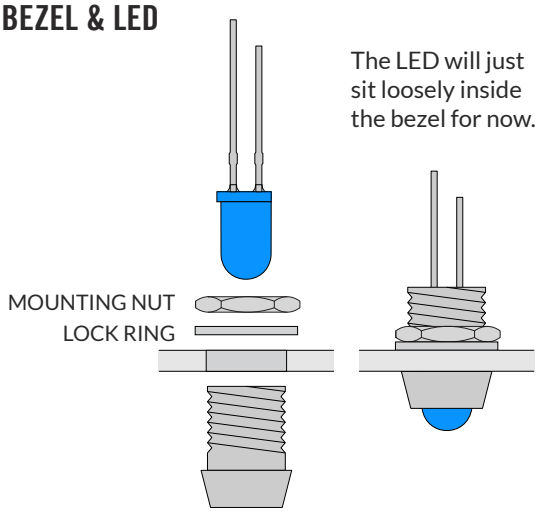
The dress nut fits over the top of the mounting nut and is for aesthetic purposes only. Wrap a rubber band around it to use as a grip when tightening. Avoid using metal tools on it or you run the risk of scratching or denting it.

POTENTIOMETERS



Drive: 10kB	Stab: 10kB
Volume: 5kB	Soft: 100kB
Comp: 10kB	Body: 100kB
Gate: 10kB	Tone: 10kB

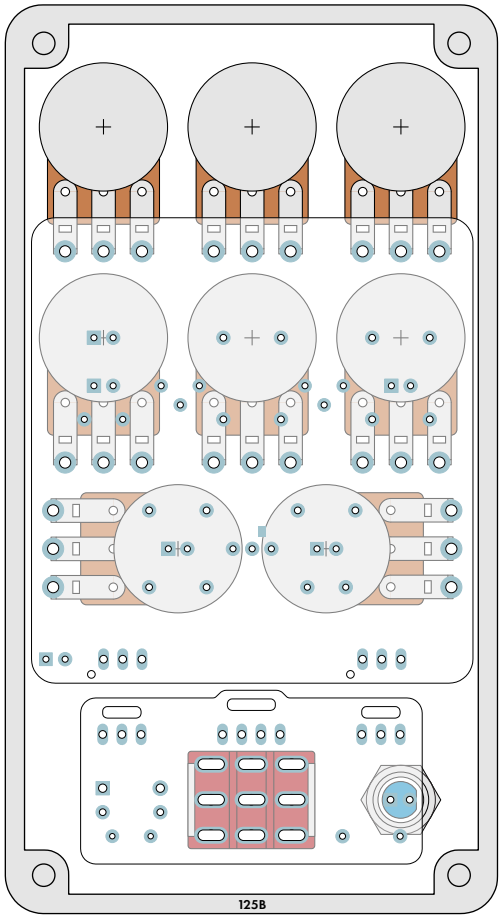
BEZEL & LED



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 as in the diagram to the left.

You may need to adjust the position of the potentiometers slightly if they are not aligned straight. There are a lot of them, so it may take some trial and error. You can try bending some of the pins very slightly to compensate.

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 three uppermost pots because the input/output PCB overlaps them and you need to avoid any of the components shorting.

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?

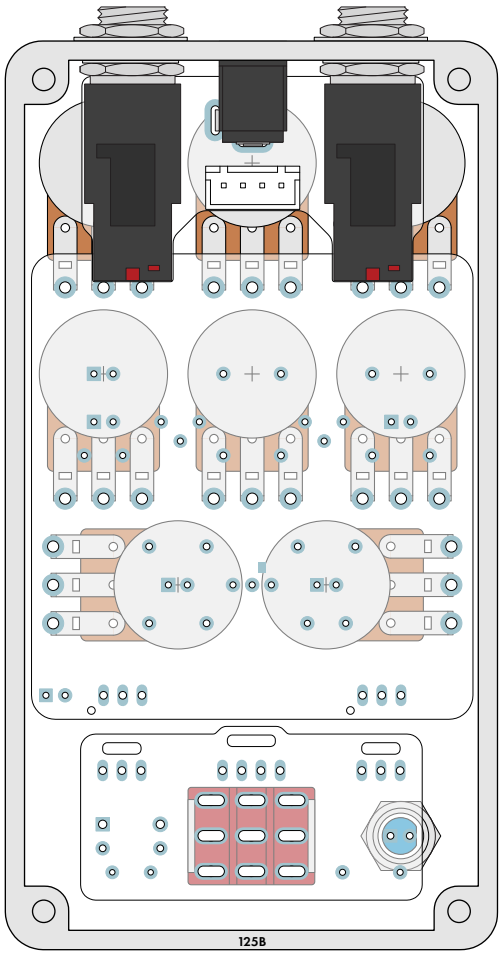
"Rock it before you box it" is conventional wisdom in pedalbuilding, and you'll often hear it recommended that builders should test the circuit before putting everything inside the enclosure. However, Aion FX projects are designed to be extremely easy to remove from the enclosure for troubleshooting,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

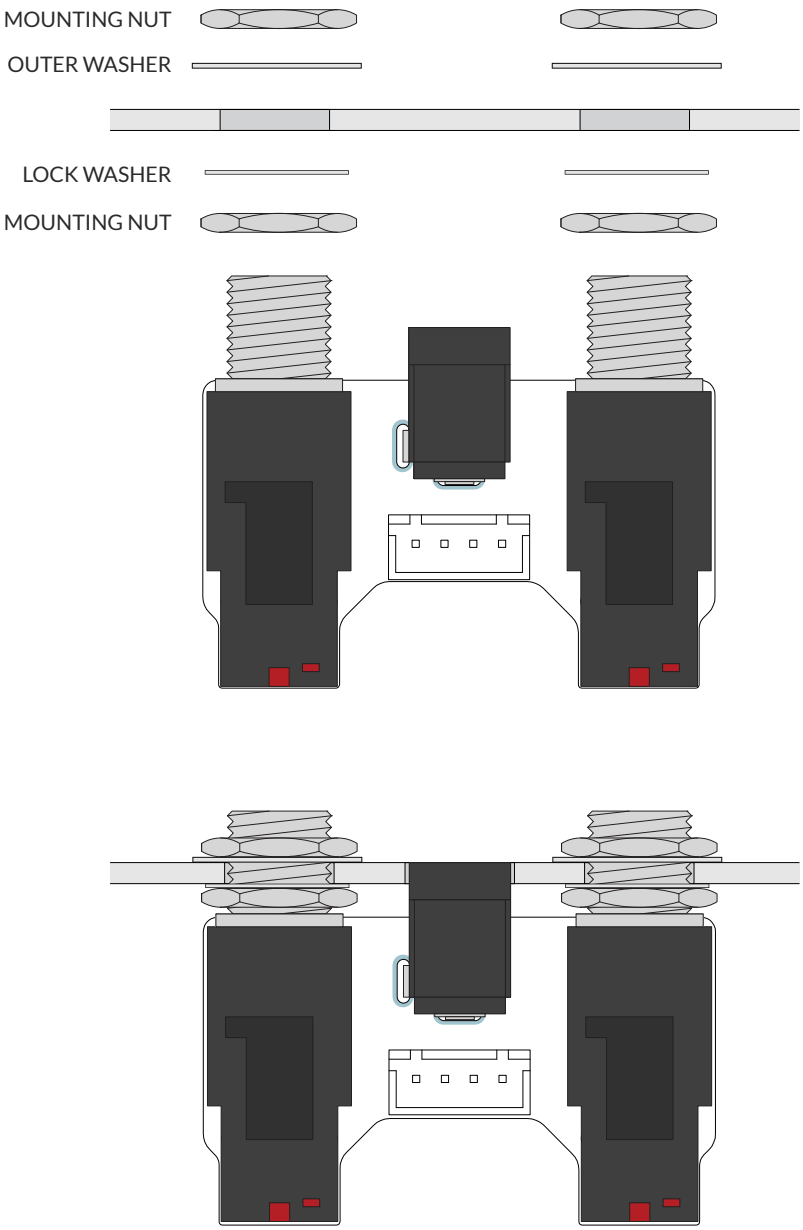
If you've read the documentation carefully and followed all the instructions, there's a good chance you will get it right the first time!

ENCLOSURE LAYOUT: INPUT/OUTPUT PCB

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

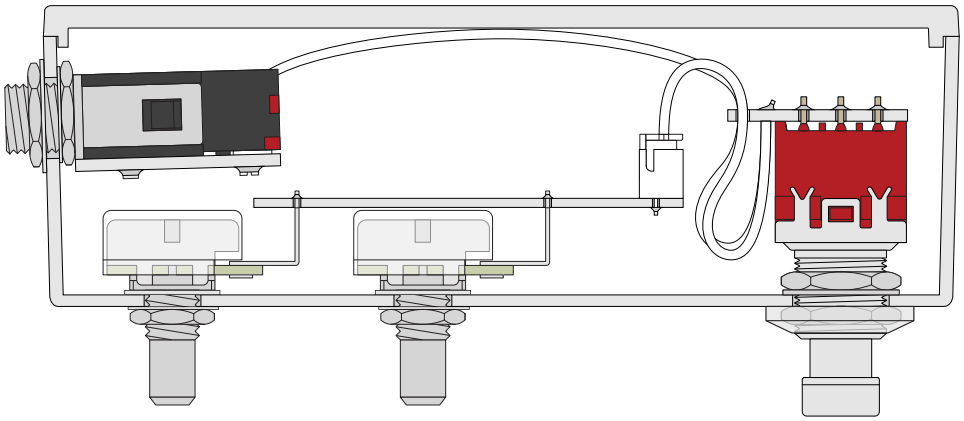
Note the use of two mounting nuts on each of the jacks, one inside and one outside. The inner nut acts as a spacer to set the DC jack flush with the outside of the enclosure. The inner nuts should be threaded as far down as they can go.





FINAL ASSEMBLY & TESTING

After everything is in place, just plug the 3 wire assemblies into their respective headers and make sure they're secure. That's it! 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. It's recommended to use the starting knob positions on the next page if you're not familiar with the Fuzz Factory circuit.

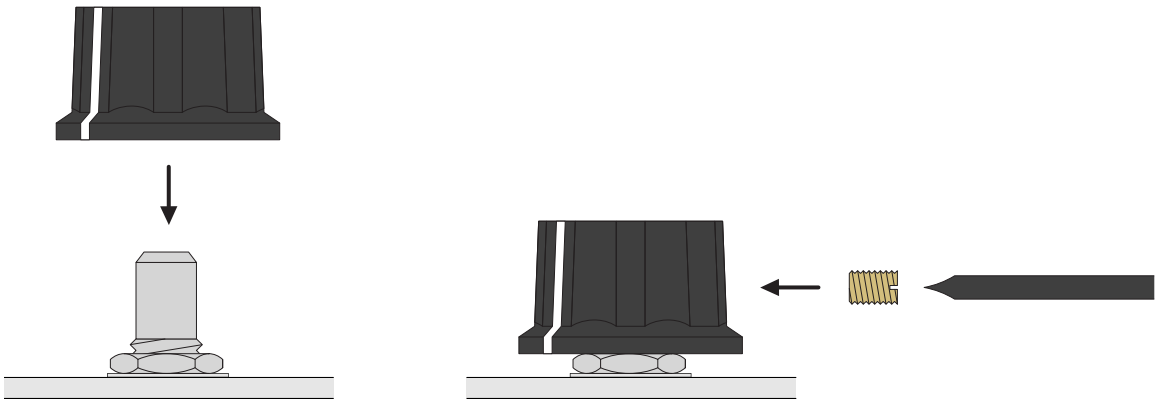
Test the bypass switch a few times, then start turning the knobs and see if everything sounds OK. If it works, great! If not, don't be discouraged. See page 26 for troubleshooting info.

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!

USAGE

This is not a user-friendly pedal! The knobs are very interactive with each other, and there are many setting combinations that don't work at all. This is a large part of the appeal of the circuit, though it can be intimidating if you were expecting anything like a traditional fuzz.

Control overview

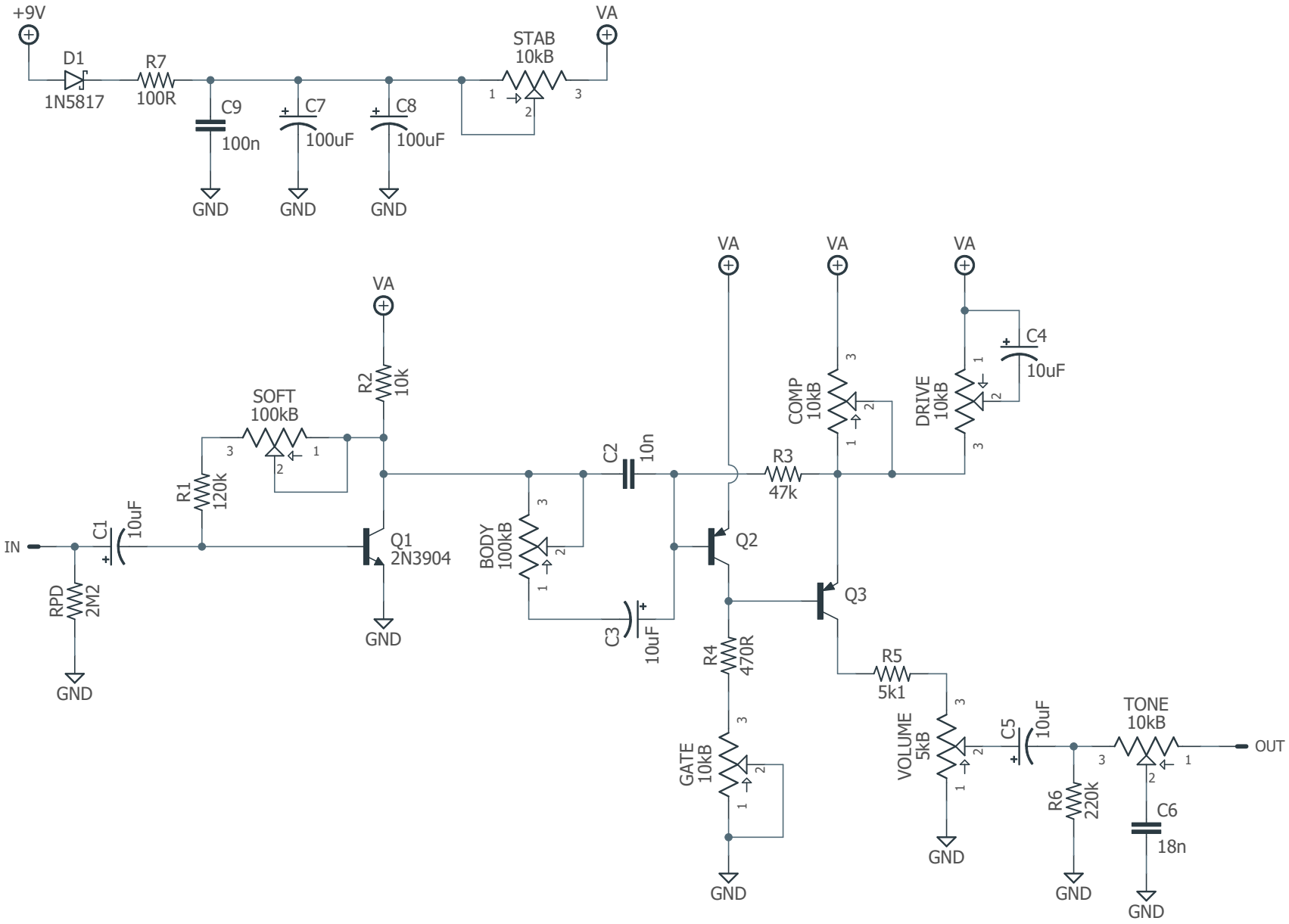
First, it's helpful to understand what each control does.

- **Drive** controls the amount of fuzz, equivalent to an overdrive's gain control. This also turns into something of a feedback pitch control when the Stab control is reduced.
- **Volume** is the output level of the effect.
- **Comp** (compression) changes the attack. It is heavily affected by the Stability control.
- **Stab** (stability) reduces the +9V supply to change the bias of the whole circuit, changing the overall character of all of the knobs and eventually throwing it into oscillation. This control cuts the voltage as it's turned down, so full rotation is full voltage.
- **Gate** turns off the transistor when the signal is below the threshold. Useful for creating glitchy velcro-ripping sounds.
- **Soft** reduces the gain of the first boost stage, which rounds out the fuzz a bit and gives it more of an overdrive character.
- **Body** is an input capacitor blend that fades between a 100n and 10uF capacitor. This increases the bass and thickens up the effect.
- **Tone** is a a treble cut appended to the end of the circuit.

Starting positions

The Flare is a very fun but very glitchy beast. If you turn it on for the first time with the knobs in random positions, you will probably be disappointed in what you hear. Use these positions as a starting point and then adjust it from there to get the sounds you're after.

- **Drive:** 12:00 (center)
- **Volume:** 9:00
- **Comp:** 8:00
- **Stab:** 5:00 (full)
- **Gate:** 7:00 (off)
- **Soft:** 7:00 (off)
- **Tone:** 10 (full)
- **Body:** 8:00


+9V
D1
1N5817
R7
100R
C9
100n
C7
100uF
C8
100uF
STAB
10kB
VA
GND
R2
10k
SOFT
100kB
R1
120k
IN
C1
10uF
RPD
2M2
Q1
2N3904
C2
10n
BODY
100kB
C3
10uF
R3
47k
COMP
10kB
DRIVE
10kB
C4
10uF
Q2
Q3
R4
470R
GATE
10kB
R5
5k1
VOLUME
5kB
C5
10uF
TONE
10kB
OUT
R6
220k
C6
18n

FULL PARTS LIST

Resistors

PART	VALUE
R1	120k or 121k
R2	10k
R3	47k
R4	470R
R5	5k1

PART	VALUE
R6	220k
R7	100R
RPD	2M2
LEDR	10k

Diodes

PART	VALUE
D1	1N5817

Capacitors

PART	VALUE
C1	10uF electro
C2	10n (0.01)
C3	10uF electro
C4	10uF electro
C5	10uF electro

PART	VALUE
C6	18n (0.018)
C7	100uF electro
C8	100uF electro
C9	100n MLCC

Transistors

PART	VALUE
Q1	2N3904
Q2	Germanium
Q3	Germanium

Potentiometers

PART	VALUE
Drive	10kB
Gate	10kB
Body	100kB
Comp	10kB

PART	VALUE
Stab	10kB
Soft	100kB
Tone	10kB
Volume	5kB

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.

It doesn't sound right.

Then it's probably working! The Fuzz Factory™ is capable of an enormous array of tones, but it also has many settings that sound awful or don't work at all. Before anything else, make sure to set it at the starting knob positions outlined on page 23. This should be a fairly traditional fuzz sound without much oscillation or glitchiness.

Be aware very slight knob changes can have huge impacts on the sound, resulting in massive changes in volume or even cutting out the signal entirely. Compare it with the Aion FX demo video (especially toward the end) and see if it sounds similar at the same knob positions.

Test voltages

The Fuzz Factory circuit is little more than a Fuzz Face with most of the resistors replaced with knobs, and the sounds are created by abusing the transistor bias in several different ways.

Because of this, there is not a set of correct or ideal voltages for this circuit as there would be with most others. Usually measuring the pins of active components can help identify simple issues, but in this case it's not going to tell you very much.

Variances between units

Since there is no biasing procedure, there will likely be differences in sound between units if you are doing an A/B test and comparing knob positions directly. All the same tones should be available, but they may not be found in the exact same knob positions.

In addition, since germanium is highly susceptible to temperature variations, one unit may not sound the same in different environments. If you're the type to find one favorite tone and "set and forget", this tone may change over time and need re-adjustment.

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

Fuzz Factory™ is a trademark of Zachary Vex d/b/a Z.Vex Effects.

Any use of trademarks is for comparative advertising purposes only under fair use. It is not an endorsement of this product by the trademark holders.

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

1.0.2 (2024-08-08)
Added link to troubleshooting guide on page 25.

1.0.1 (2023-08-29)
Updated LEDR (LED current-limiting resistor) to 10k to reduce brightness.

1.0.0 (2022-01-21)
Initial release.