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DEBUGGING GUIDE



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Debugging guide

We're sorry to hear that you are having troubles with your kit, but don't worry! At first building your pedal may be a bit tough, and we'll do our best to help you. To do so, please follow these steps and send us the results so that we have a better idea of what may be causing the problem.

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Debugging guide

Although building your pedal is quite easy when following the building manual, here you can find some points to check in case you are having some troubles getting it to work.

This is a quick reference chart where most common problems can be found as well as the solutions. If you don't find your problem listed here or are not sure, follow the steps in the guide.

PROBLEM	Things to check	Comments
THE PEDAL DOESN'T	1. Jacks are connected	
WORK, EVEN IN BYPASS MODE	2. 3PDT connection	section 1
THE PEDAL ONLY WORKS IN BYPASS MODE	1. Jacks are MONO	
	2. DC/battery connected and working	section 2.a
	3. 3PDT connection	section 1
	4. Solder joints	section 2.b
	5. Part polarity	section 2.b
	6. Signal path	section 2.c
THE POTENTIOMETER	Pins 1 and 3 of the potentiometer are	
WORKS BACKWARDS	swapped.	
THE PEDAL WORKS,	Multiple causes, check section 3	
BUT NOT AS EXPECTED		

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<u>1- The effect doesn't work at all, and there is no bypass signal either.</u>

If that's the case, as the footswitch bypass is independent from the effect circuit, the problem must be in the 3PDT connection. Please check that everything is connected as stated in the *kit assembling guide* that can be found in the building guidelines of the pedal. Check that your jacks are perfectly plugged as the connectors may be a bit hard the first times you use them. The cables may also be damaged, so please be sure that you are using new or at least perfectly functional ones.

2- The bypass works well, but the effect doesn't

First of all, check that you are using MONO jacks. The automatic switch-off function to disconnect the battery when unplugging the input jack requires mono jacks. Consequently, to do all the tests the jacks must be connected or the effect will be disconnected.

The DC connector must be connected too even if the battery is being used.

Double-check that resistors, capacitors... have the right values and are in the right place. You can check out our tutorial on reading part values here:

http://puzzlesounds.com/guides-tutorials/

a. If the led is not shining when the effect is engaged

First of all, check that the LED polarity is correct (check the *kit assembling guide* in the building guidelines of the pedal).

If the polarity is correct and the LED is still not shining, the board is not getting power. Check that the connections of the DC connector and battery are as specified in the *kit assembling guide* that can be found in the building guidelines of the pedal.

b. If the led is shining when the effect is engaged

In this case, there is a problem in the assembly of the board. We recommend you to check the following points:

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<u>Solderings</u>: the aspect of a good soldering joint is the following one:



If your soldering has not enough/too much tin, or if it has been heated too much/not long enough... your solderings may look as the followings. Try with a good quality tin and soldering iron, **as good solder joints are a must to get your pedal working perfectly.**



- **Adjacent pins not touching**: if near pins are touching, as in the following picture, the pedal won't work properly.



- ICs, transistors, diodes, and electrolytic capacitors polarity: these elements, as explained in the building guide, must be connected with the appropriate polarity or they won't work, and might even be damaged permanently. Check your pedal's building docs to find all the information concerning the right polarity of the parts.

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c. Follow the signal path, and find out where the signal stops.

You can do this with both the schematic and layout pictures you can find in the pedal's building guidelines. To do so, you'll need a jack with one of the sides cut, and with two probe pads as in the following picture:



You can build your own from an old/cheap guitar jack. You just have to cut one side, and solder one probe to the external wire mesh (ground) and the other to the central wire (signal).

Then, connect the ground probe to the ground point as in the following picture.



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Now, using the signal tip, we'll be checking the signal in different points from the signal path. This would be the signal path in our example schematic:



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And these are the joints you should check to find where the signal stops:



The connectivity between parts can be checked with a multimeter, and all the information can be found in the building docs. To check the joints, just touch them (from the top or the bottom, whichever is easier), while you play something with the guitar. It's usually easier when somebody helps you:



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Knowing how to follow the signal path will require some electronic knowledge; but in general, it will be the shortest way from the input to the output. If there is something missing, or you need anything else, send us a mail.

In this example, if you find out that the signal stops working on 5, it would be a good idea to check that:

- C5 has the good value
- C5 is connected with the right polarity (if electrolytic)
- R6 has the right value
- The other pin of R6 is connected to VCC (9V)
- Q2 has the right orientation

- Q2 is the right transistor (some circuits have different transistors, as 2N3906 and 2N2222; the code is written on them, but as they look similar, it's possible to swap two of them by mistake). Usually, using the wrong transistor will make the pedal not to work at all.

3. The effect works, but not as expected.

This case is the harder to debug, because anything could be causing the problem. First of all, check that all the resistors and capacitors are at its place with the right values. If swapping two resistors whose code may look similar (as 47k, with a red multiplier color band, and 470k, with an orange one), you could make a pedal stop distorting (for example, an overdrive) and just providing a slight boost of the signal, or not distorting as much as expected; a delay having different delay times than it should; or an autowah filter not working at all, among other examples. This also applies to capacitor values, and transistor, diodes and IC polarity.

Proceed to the step 2.c, looking where the signal stops sounding as it is supposed to, and work on the parts around them.

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None of this worked? Don't worry, we're here to help you! Learning to solder and debug a pedal takes time, and it's often very frustrating.

If your solder joints look good, no adjacent parts are touching, and everything looks fine, please send us a mail with a description of the problems, as accurate as possible:

- Kind of jacks used,
- DC source (battery/power adapter and voltage),...
- Results to the step 2.c/3: where does the signal stops/starts degrading?
- Include also some pictures of the top and bottom of your board, with the best resolution possible to make it easier for us to find the issue.

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