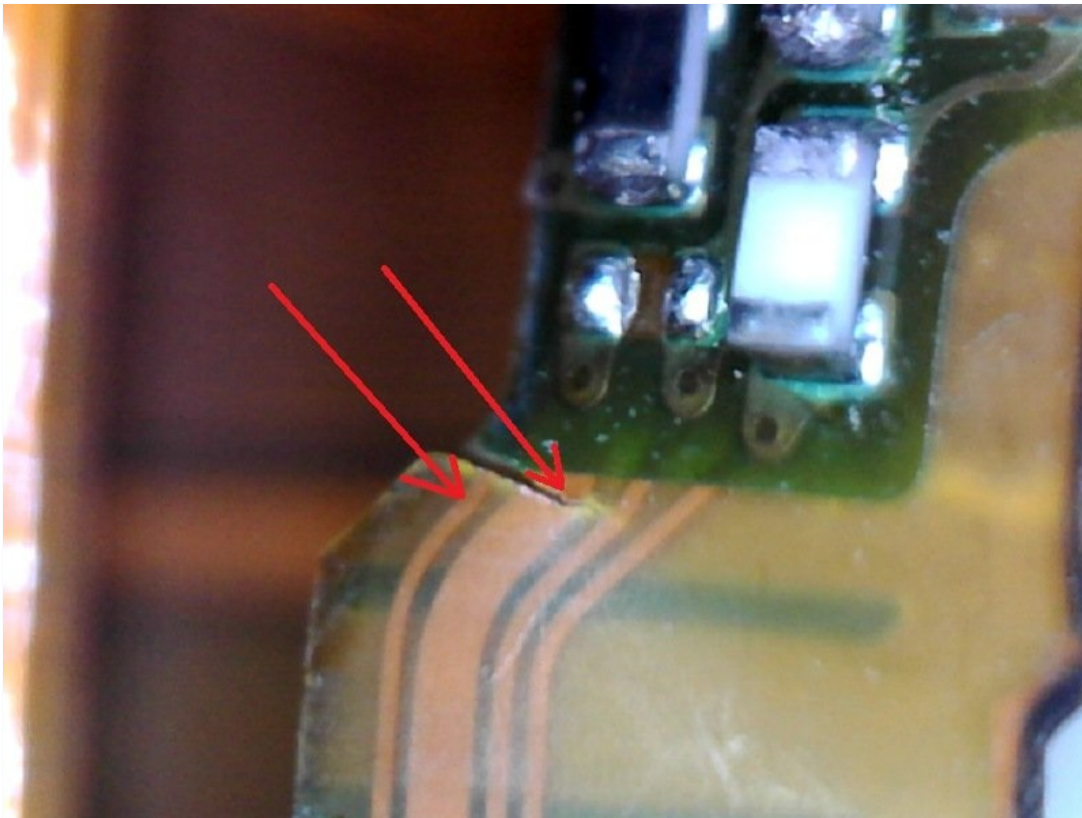




How to repair a broken flex cable (Sony Xperia Z1 microphone flex)

It indeed seems to be a fairly common problem...

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INTRODUCTION

It indeed seems to be a fairly common problem for Sony Xperia Z1's microphone to stop working. There are different levels of microphone problems, and in this guide I will try to explain each of them as well as I can. You must have previous experience with surface-mount soldering, and obviously [disassembling and reassembling the device](#) is a piece of pre-requisite knowledge. This guide's main objectives are to show step by step how to make a jumper, advanced techniques on repairing flex cables (Yes, i know it is in most cases absurd to even consider bothering to fix a flex cable) and also to collect together scattered info about the Z1 microphone problems. Keep in mind, however, that all this knowledge has no official source, only scattered forum posts around the web and my personal experiences.

TOOLS:

[Microscope](#) (1)

[Soldering Iron](#) (1)

[Lead-Free Solder](#) (1)

[Flux](#) (1)

[Tweezers](#) (1)

[Precision Utility Knife](#) (1)

Step 1 — Diagnostics



- To begin understanding the problem, you should go to *settings -> about phone -> diagnostics -> tests* and test the functionality of the microphone. Alternatively, you can dial **##7378423##* and test the mic in the service menu.
- The test result is important for understanding the problem. You can get muffled sound, no sound at all, or just buzzing. The test result defines what kind of actions you should take to repair your device.
- Also test the secondary microphone (used for things like recording sound for video), it might come in handy later to know if it works.

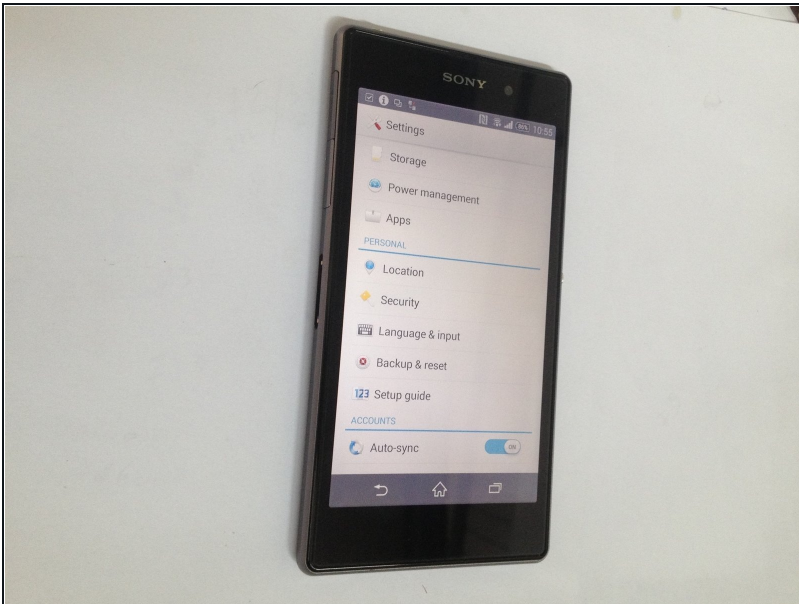
Step 2 — Exclude the obvious problems



- Sometimes solving the problem can be way simpler than anticipated, and therefore you must exclude the obvious problems, such as pocket lint in the holes at the bottom of the phone, where the microphone picks up the air pressure changes that the phone interprets as sound.
- So, check the holes at the bottom, and you might save yourself a lot of work. I have had this help for one of my customer's phone before. If this helped you, great! If not - which it usually doesn't - don't worry.
- ① Depending on the device in question, there can be washers, grounding pieces, or even plastic covers above or between parts that should be checked and then *re-checked* if you have **previously replaced something** inside the device. If not, it is *possible* that replacing the part, for example the microphone, *might* help.

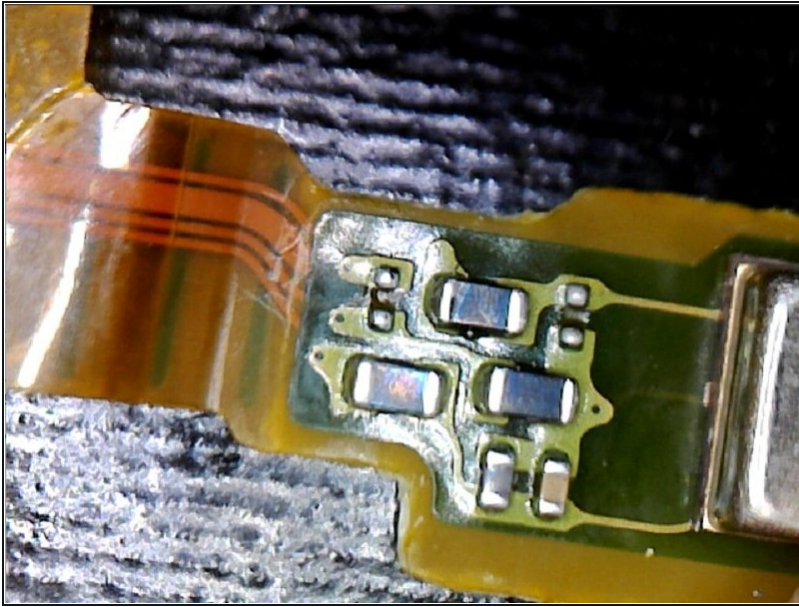
⚠ Keep in mind, that without the proper know-how, precision, and patience, you can do more harm than good to your electronic device if you try replacing things on your own. Always exclude the simple problems and software problems first before jumping to conclusions and replacing a part.

Step 3 — Software problems



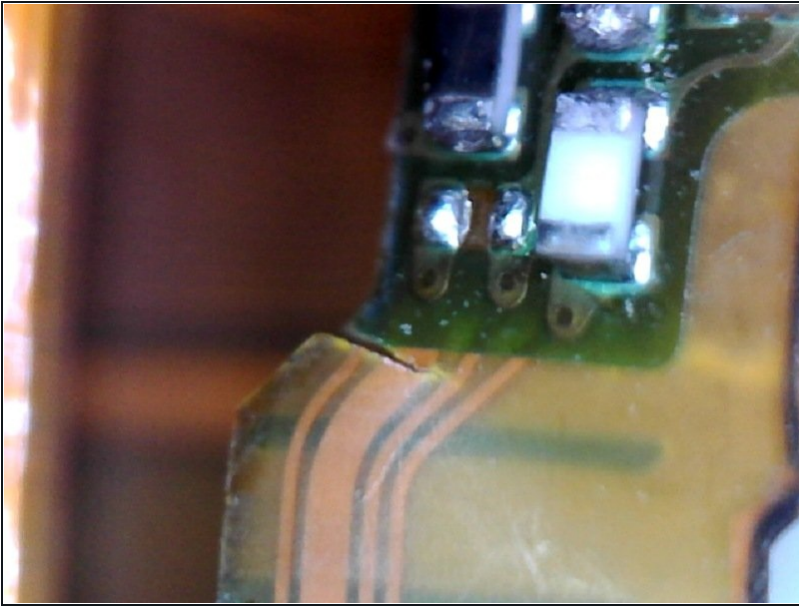
- You can try a [hard reset](#), or updating the device's operating system or going back to an older, working system. I will not go into detail about the software side of the repair here, for I am way too ignorant of such matters to guide anyone about them. To find help look your device up on sites like xda developers.
- I have come to believe that usually problems that you have caused by meddling with the devices software are only solved by fixing the software.

Step 4 — Different symptoms



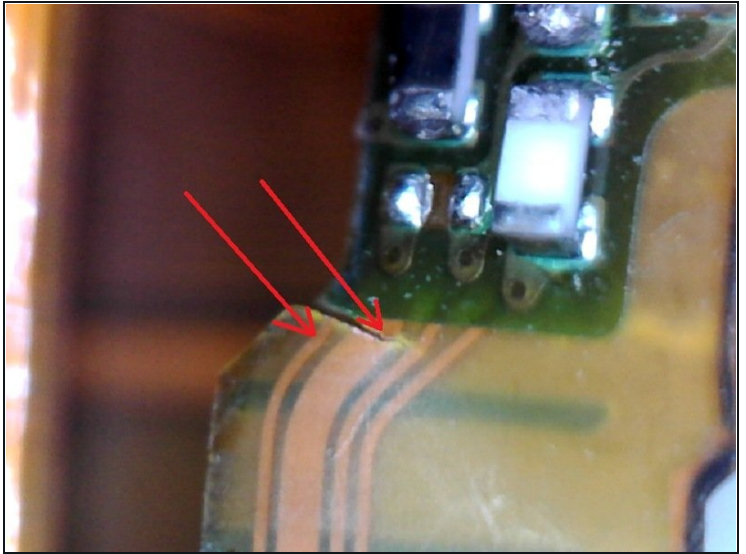
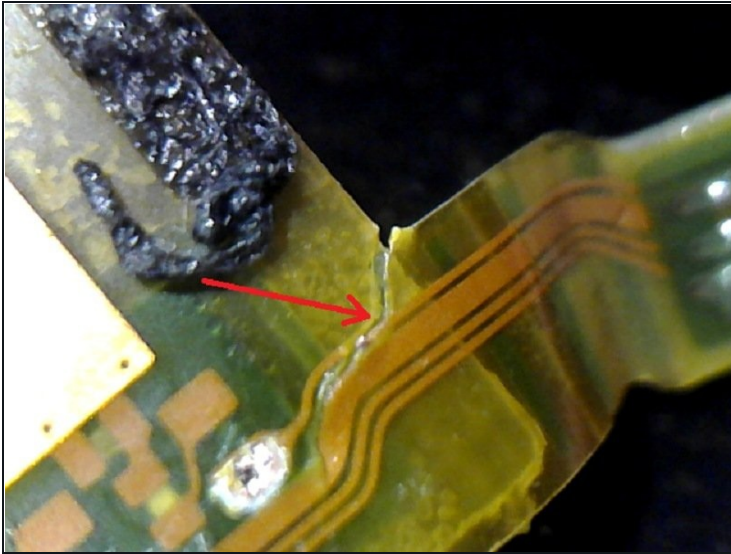
- If you get **muffled** sound, you most likely **do not have any problems with the flex cables**. This might mean there is dirt somewhere, or you have faulty mic settings.
- **No sound at all points to a broken mic or damaged flex cables**. If you (or anybody else) have never opened up the device you do not have a broken flex. They don't break on their own.
- **Buzzing noise** might mean **damaged** mic (water, moisture...) or some faulty mic settings. For some people, disabling mic noise suppression and equalizer have helped.

Step 5 — Broken hardware



- If you have had no problems with the mic prior to an operation on the phone that requires opening up the device, but problems appear right after, chances are, a mistake was made at some point.
 - For Xperia Z series it seems to be a common problem that upon screen replacement the microphone goes mute. And the culprit is *almost* **always** the flex cable. Even experienced people make mistakes sometimes, and flex damage is a very common thing to go wrong during the screen replacement. And that is what this guide is about.
- ① Other possibilities include
- A surface-mount component has been knocked off the board or on the flex.
 - There is dirt or a bad connection between the flex and the motherboard, or between the part and the flex.

Step 6 — Spotting the broken flex



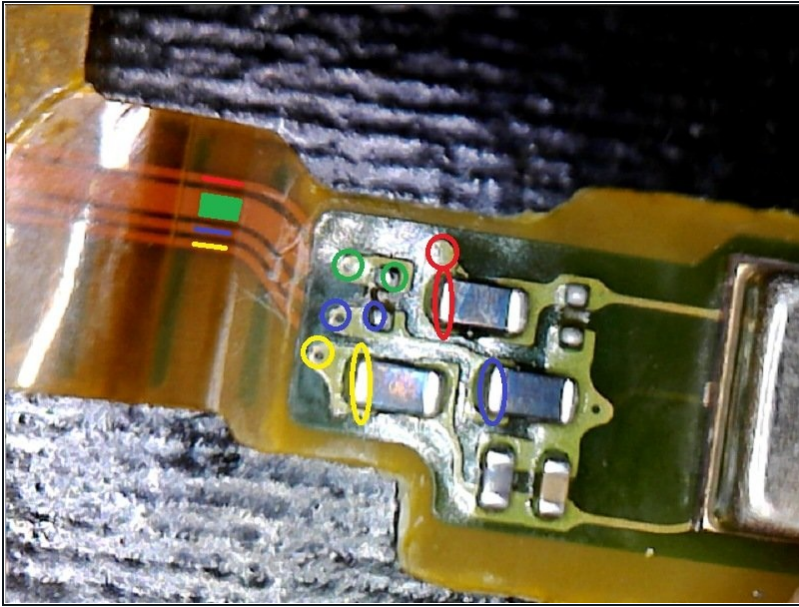
- To find a broken flex you will need to obviously focus on the flex cables and areas of flex cables that were touched during the previous repair. For Xperia Z1, the problematic cable is the large flex cable that leads from the motherboard to all the buttons and the screen.
 - You will need a keen (or experienced) eye to spot a damaged flex cable by eye, and therefore some magnification is recommended.
- ⚠ Note how the tear was under the black rubber that has been peeled upward to uncover the torn trace. Sometimes it can indeed be difficult to spot the defective points.
- The flex commonly tears near a bend in the flex or in a narrower area. See the pictures from two broken mic flexes for Z1. The first image is the original flex which I accidentally tore and the second is a replacement which arrived broken. Not trusting the second replacement to be ok, I repaired the original...

Step 7 — Buying the new flex



- Finding the broken flex is usually the end of the diagnostics part, and the replacement pieces are oftentimes fairly cheap.
- ⚠ When ordering a new part, double check the model numbers and the pictures to ensure compatibility.
- For iPhone 6 home button flex cable repairers (Error 53) , or people who do not have the time to wait for a new part, I will include these following parts more as a curiosity than actually something worth doing as common practice. Unless you don't have a good reason (or enjoy it like I do) don't fix a broken flex cable. It rarely is worth it.

Step 8 — Planning the repair



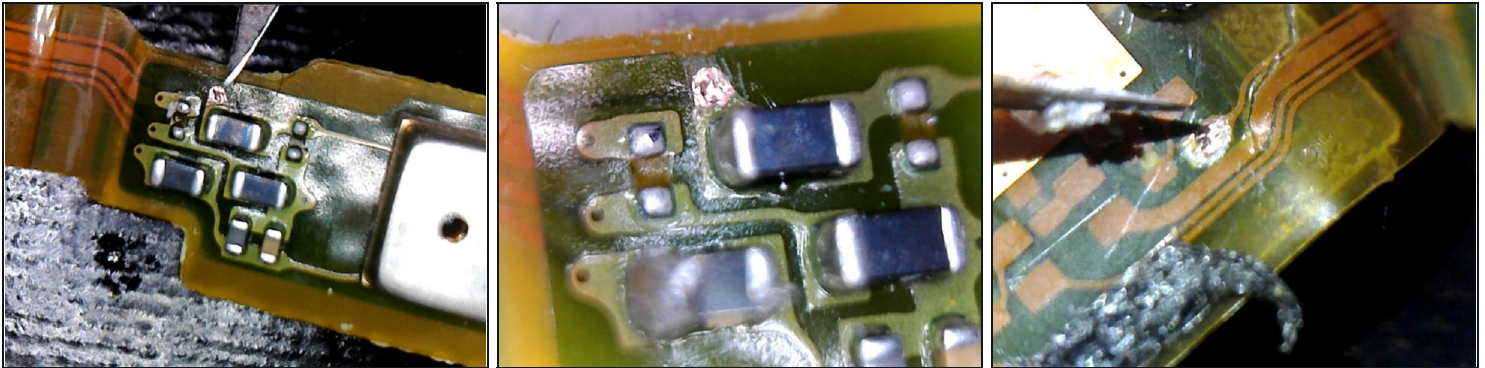
- If you have decided to fix a flex cable, you must have a good plan where to attach jumpers from and where they will lead to. Good jumper points are for example the sides of SMD components, or broader areas of the trace. I have circled a few potential points for jumpers for different traces in the picture, so that you get the general idea.
- You must understand the concept of jumpers to successfully make a jumper on the flex. The wire has to be insulated, or you will end up with strange connections and damage. Enameled copper wire is something I personally use a lot, or sometimes pieces of scrap flex cable (more difficult).
- ① Look for as much free space as possible for the jumper points to avoid knocking over SMD components with your soldering iron. It is also possible to accidentally burn or desolder a component, so I would advice to favor the free, empty pads for jumpers.

- ① Keep in mind the routing of the flex cable inside the device to avoid placing solder and jumpers where there isn't room for them.

⚠ *Avoid using hot air, this can burn and warp the flex. You must do most of this by hand soldering using an iron, so previous SMT experience and a microscope are a **MUST**.*

- See the next steps of the guide before cutting your jumper to get the general idea of what kind of a jumper you're looking to make.

Step 9 — Cleaning pads

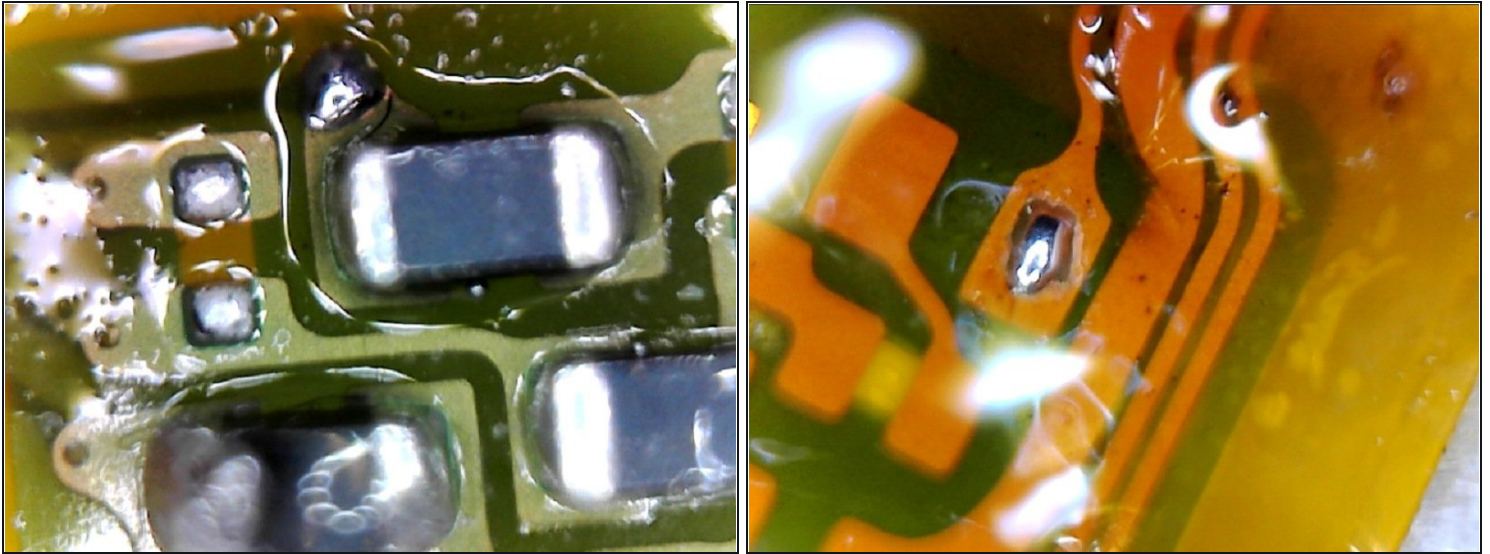


- After locating an auspicious looking pad, scratch it with the tip of an exacto knife until the copper is exposed.

⚠ Be extra careful with the knife; don't press hard. You might have to gently scratch the surface for half a minute for the copper to show. Practice this (and actually all parts of this repair procedure) on scrap flex cables.

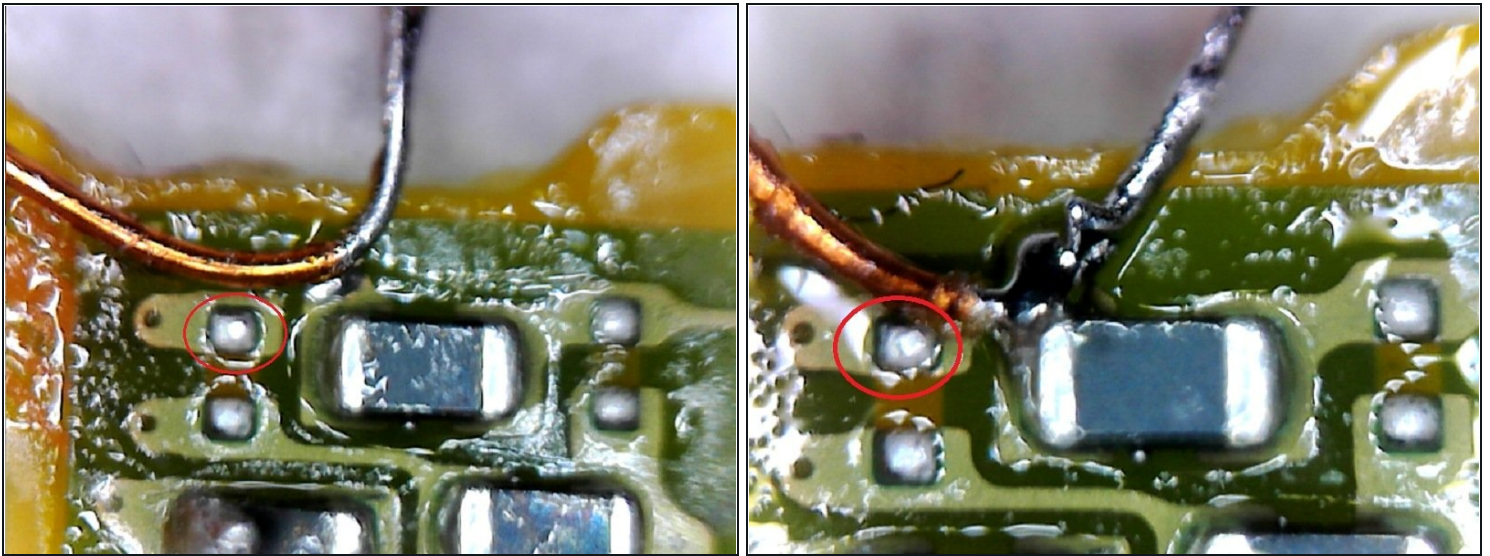
- Proceed to clean the pad with alcohol (not under the influence, though), and a Q-tip.
- Do the same procedure for the second jumper point.

Step 10 — Tinning the pads and the jumper



- Spread flux onto the pads, and with your soldering iron gently touch the pads with the tip of the iron with some solder to tin them. See the pictures and practice this beforehand. In the second picture the pad has received a smaller tinning due to insufficient cleaning done to the pad. Go for larger solder pads than that if you have the space.
- Also tin the ends of your jumper. To remove enamel on the jumper, use a file or a knife, and then with lots of flux add some solder (Not a lot!) onto the end of the jumper. It is enough to see that the end of the jumper is silvery. A large blob of solder is bad.

Step 11 — Soldering the jumper

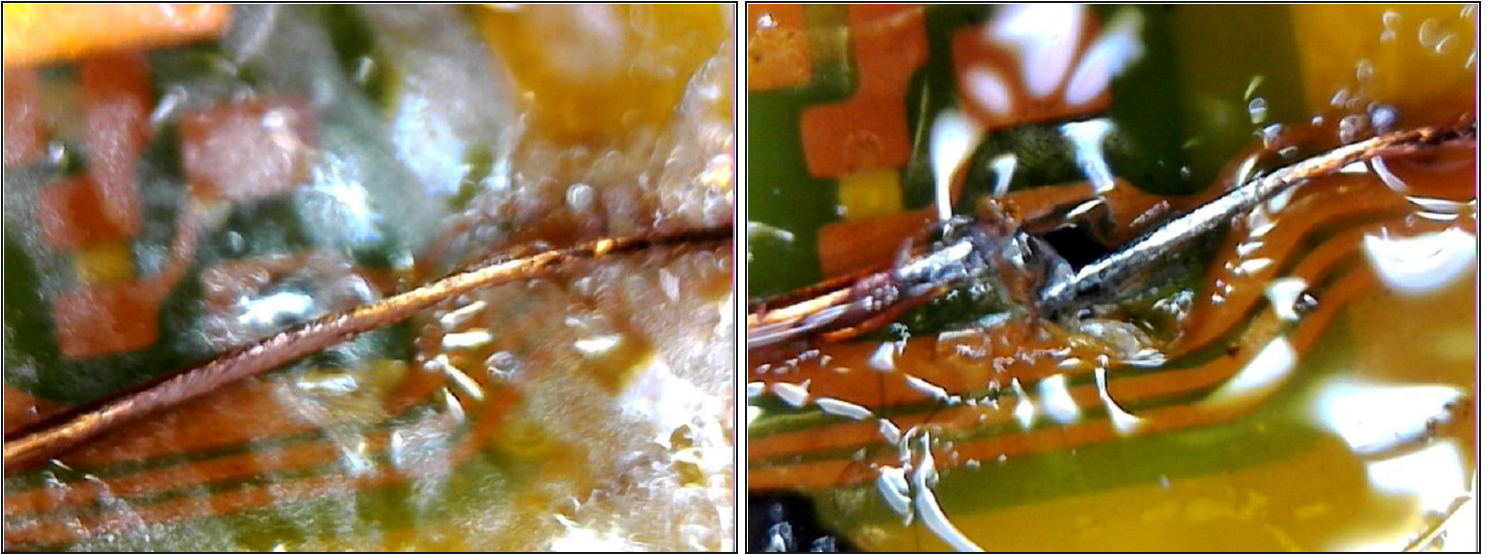


☑ Add more flux ([Jessa](#) quote)

⚠ Avoid leaving any exposed wire after the solder contact - this can and will touch other components and **** up the device. Check the first picture: I am leaving all the extra tinned section of the wire to be cut off later. Even now there is an empty pad slightly too close for my liking (circled in red).

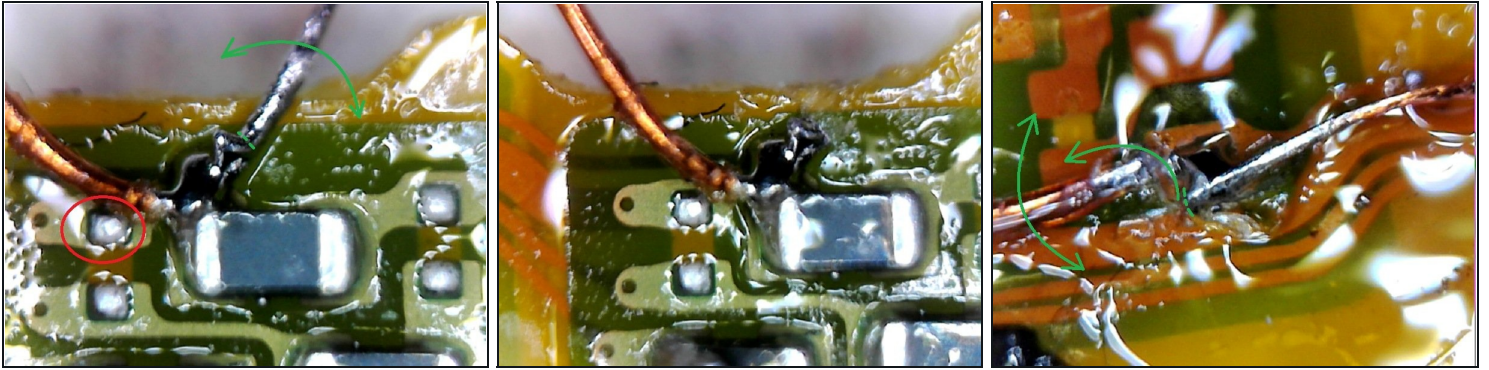
- Carefully solder the jumper into place, holding it with [tweezers](#). Don't worry about the length of the jumper yet.
- In the second picture, a solder bridge has formed, due to too much solder used. I believe this is a good example of failed soldering, of what can happen if you're not careful. But, in this case, the bridging didn't matter (check the first pic to see why) so I just let it be.
- The pad that was already a little bit too close now got way too close, and I ended up wiggling a piece of tape as insulation in between the jumper wire and the pad after cleaning the area of flux.

Step 12 — Soldering the jumper cont'd



- Measure the jumper to easily reach the pad you're going for. Remember to route the jumper *flat* across the flex. If the flex needs to bend somewhere on the way, make sure the jumper wire is long enough. Also keep in mind that you should never use copper wire to repair flexes that need to move in the device, for it will without doubt, break.
- Poke the wire a couple times with a file to expose copper if your earlier tinning is insufficient, and only enough to solder onto. And then tin the wire again.
- ☑ Add more flux.
- Solder. Apologies for bad pic quality. In the second picture, I have also already cut the extra wire off.

Step 13 — Removing the excess wire



- Grab the excess wire with your tweezers, and bending back and forth, gently snap it off. Repeat the same procedure for the other end.
- ☑ If you break your solder joint by twitching the leftover wire carefully back and forth, the joint was too weak to begin with.

Step 14 — Cleaning



- Wipe away all the flux with a Q-tip and some IPA (Isopropyl Alcohol). **Never** spray "IPA" straight onto the mic, or anywhere near the screen, it might cause distortion later on in the mic and color distortions between the LCD layers.
- Tape and or glue the torn parts of the flex cable so that it doesn't tear further. **Never use super glue for gluing**, rather use epoxy or such. I personally added a drop of epoxy and then taped around it to create a neat package around the torn flex.
- I also had to cut a small hole in the mic enclosure for my jumper wire to fit through atop the flex nicely.

Repeat the same procedure for all torn flex traces and you're done. Good luck. And also, if you do attempt this, post your results here, and if possible, send me pictures of your results. And most importantly, if you're an expert reading this, please take the time to correct me if I do something wrong.