

Troubleshooting

Common Issues & Fixes

Fixing ugly solder joints and removing components is just a fact of soldering life. But it's all good, because I'm going to show you how to fix them. In most cases, it might be easier than you think. Let's go through some common issues, what might have caused them, and how to fix it.

Solder Wick/Desoldering

Learning to use solder wick is very important. It's not hard, and you'll eventually have to do it. The basic jist of how solder wick works is that when you heat the solder and wick together, the solder will be sucked up to the wick and away from your joint. Let's see it in action.

Make sure you have a hot iron ready to go. You'll want to apply flux to the joint first to help things flow. Pull out a little solder wick and put the end of it over your joint. Apply heat to the top of the solder wick. Once the solder melts it should be drawn into the wick. If you need more solder removed, move up the solder wick until you get the desired level of removal. That's it! That portion of solder wick is now used and you can cut it off and throw it away.

If you want to remove the component, you just keep using the solder wick until the part becomes free to remove.

Sometimes that can prove to be difficult to do. If it seems like you just can't get the component out, you can use a pair of needle-nose pliers to pull on the component as you heat up the joint. It's not the funnest thing you'll do that day, but sometimes it's the only way to get those stubborn components out.

Cold Solder Joint

A Cold Solder Joint is one that did not melt completely. They may work, but the joint is very weak both electrically and physically. It can develop cracks and eventually separate from your board. You'll be able to recognize these by their rough or lumpy surface. You most likely didn't have enough heat, or didn't allow the entire joint to heat before applying solder.

To fix this you just need to apply flux to the joint. Then apply the iron to the joint for a few seconds to allow it to adequately heat up the entire joint. Remove heat and clean up.

Overheated Joint

At the other extreme, we have an overheated joint. If your heat is too high, you'll likely cause damage to the board and/or component. You'll find that you will likely burn any flux before the solder has a chance to melt, which can inhibit the flow of solder.

To fix this you'll need to clean the joint really well with IPA. Once you've done that, reevaluate your iron temperature and iron tip, apply some flux, and try again.

Too much solder

So, you got a little carried away with the solder? It happens to the best of us. While it's not ideal, it's not the end of the world. You may still have a good solder joint, but you can't really tell since the joint is completely covered.

To fix this you can use your iron to remove little bits of solder at a time. The solder will wick itself to the iron, just like when you tin the tip. You'll want to add flux to the joint so that you don't oxidize the joint when applying heat. Just wipe the excess solder from the tip, and repeat until you get a good amount of solder on your joint.

Solder Starved

A solder starved joint simply does not have enough solder. It may work electronically, but the joint is weak and can crack over time.

To fix this, apply some flux to the joint. Then solder like normal until you get your volcano shaped solder in the joint.

Disturbed Joint

A disturbed joint is one that has been subjected to movement as the solder was solidifying. While not a huge issue, it can cause issues later in the project's life, and isn't good practice to leave a joint looking like this.

To fix a disturbed joint, you'll want to apply flux and then apply heat to the joint for a couple seconds, then remove heat and clean up.

Insufficient Wetting

Insufficient wetting refers to when the solder doesn't adhere to the pad or leads correctly. The solder will appear to ball up as it touches the surface. The main cause for this is a dirty circuit board, or inadequate heating. Any kind of oils or dirt on your board can make soldering almost impossible.

To fix this, you'll want to clean the component and board as best you can with IPA. Apply flux to the joint. Solder as usual.

Bridging (AKA Solder Bridge)

When pads and components are really close to each other, it can be easy to join them together if you apply too much solder to a joint. If you find that you've bridged two joints, you only need to remove the excess solder.

To fix a bridge you can use just the iron to wick away little bits of solder from the joint. Or you can use solder wick to remove more at a time. Just know that you might need to resolder the joint if you use solder wick. You'll want to apply flux to the joint either way you go.

Lifted Pad

A lifted pad on a printed circuit board is a pad that detached from the surface of the PCB. You'll find that this happens when you heat up a joint too many times, or with too much heat. Cheaper boards are prone to lifted pads, so use extra caution when using them.

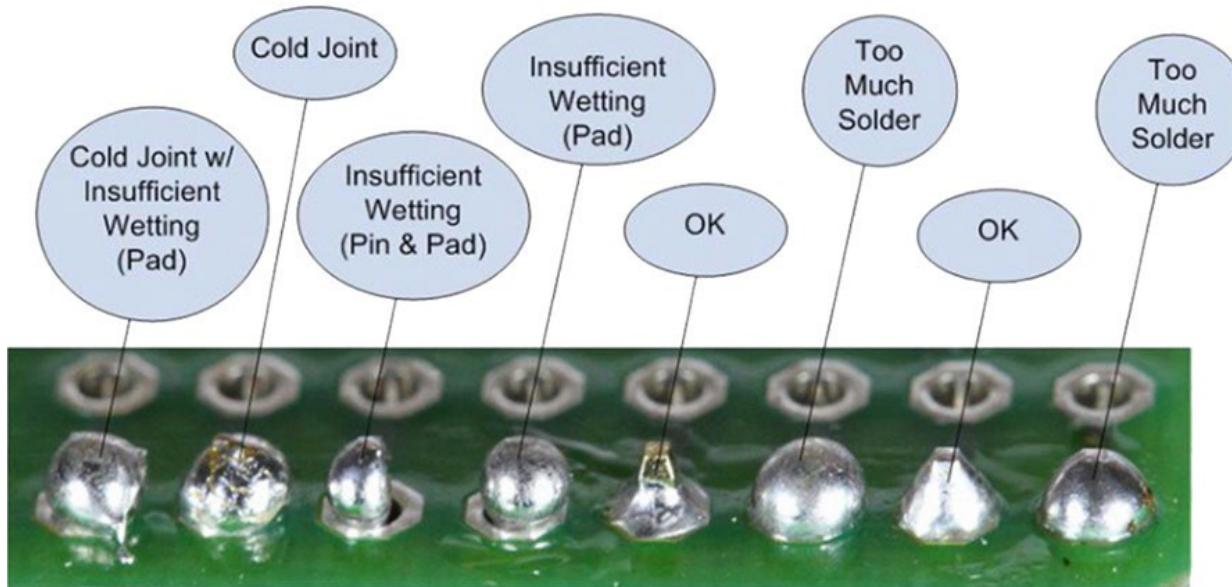
This can be a tricky issue to fix, but there are a couple of things you can do to fix it, or go around it. The first thing you can try is bending the lead in the direction of the copper trace until it overlaps a part of the trace that's still in contact with the board. Then apply solder from the tip of the lead to the hole. It's not pretty, but it'll work.

If the trace is coated and you don't have access to it, you may end up having to run a wire from the component lead to the next component lead. If you end up going this route, make sure you use some hot glue to secure the wire and keep it from dancing around.

Helpful References

Common Soldering Problems

by Bill Earl



SOLDERING

