
Basic Soldering

Note: The “Basic Soldering Guide” was written by Alan Winstanley, is © 1996-2006 Wimborne Publishing Limited, Wimborne, Dorset, England. Everyday Practical Electronics Magazine has provided this document as a free web resource to help constructors, trainees and students. It is available on the web at

<http://www.epemag.wimborne.co.uk/solderfaq.htm>

E-Lab #2 requires that you build a simple oscillator circuit using an LMC555 timer chip. Use the attached “Basic Soldering Guide” as a reference even if you have soldered before. Soldering is part technique and part art. Pay particular attention to the photos in the galleries. Below I have added some comments to emphasize some of the common errors that Engineers make when trying to solder. While soldering is not something that an engineer is typically called upon to do in their career, it is an important skill and you need to have a basic understanding, particularly regarding how soldering can go wrong.

1. Novices always use too much solder. It only takes a tiny amount.
2. Solder flows toward heat. To obtain a proper solder joint, you need to get even heating of both the pad and the lead.
3. For good heat transfer, your soldering iron must be clean. Use the sponges to wipe you iron before every solder joint.
4. You are usually better off heating the joint and then applying the solder. However, it is not uncommon to need your other hand to hold a component in place during soldering. In this situation, apply a small amount of solder to the iron and bring it to the first joint. This joint will then hold the component in place while you solder the other leads. Then go back and fix the first joint as it likely is not the greatest.
5. Too much heat can delaminate the pad or, more importantly, damage the component. Most components have a spec for the soldering temperature and time. This is particularly important for surface mount components as there is less thermal mass to dissipate the excess heat. Cracking the case or melting the internal wirebonds is the primary failure mechanism
6. Liquid solder flux is a heat activated cleaner that can dramatically improve solder joints. It only takes a tiny amount of flux for a joint. Never use acid flux (plumbers flux) on electronics. It will damage the joints. Always clean the flux residue using alcohol or a commercial flux remover.
7. Desoldering is accomplished using copper braid or suction type tools. It is likely that braid is all you have available. Desoldering can be difficult and it takes some time to get proficient.
8. You will eventually burn yourself either with the iron or when you are trying to hold a component lead in place. However, if you use a little care and you can avoid severe burns. Be careful!