A No-Special-Tools SMD Desoldering Technique

You don't need a fancy fabrication shop to get surface-mount devices off the board.

Wayne Yoshida, KH6WZ

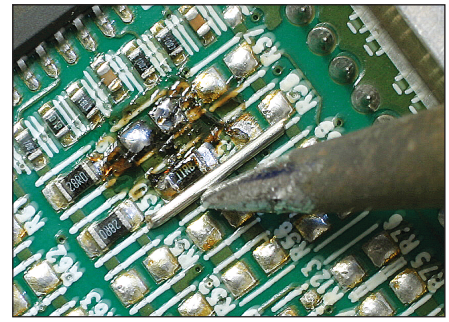

Figure 1 — A small piece of bus wire is used to transfer heat to both sides of the component at the same time.

While modifying a commercial 23 GHz assembly for ham radio use on the 24 GHz band, I had to remove and replace several small surface-mount devices (SMDs). Although several techniques have been described to remove an SMD from circuit boards, I have developed a way to remove these tiny parts without any special tools or a need for a second soldering iron. In addition, this technique does not destroy the component or the circuit board.

Flood, Float and Flick

I call this the *flood, float and flick* (*F3* for short) technique: The component and board are heated, and as the solder begins to melt, more solder is added to the area, flooding the component area. Then, a flick of the iron tip moves the part so that it can be picked up with a pair of tweezers. I use a standard Weller WTCPT soldering iron, with an 800° screwdriver tip for all work.

The main idea is to heat all sides of the component at the same time, so that the device can be picked up and removed from the circuit board. Since surface-mount components are so small, it may be possible to use a large chisel-point soldering iron tip to heat both sides of the component.

The general concept is based on the old trick of wrapping a piece of solid copper wire around a soldering iron tip, to solder small components. In this technique, a small piece of 20 gauge tinned bus wire is used to transfer heat to both sides of an SMD resistor, as shown in Figure 1. In this photo you can see that a component has already been removed, using this technique.

Although I have not tried this, it should be possible to shape the wire into a small circle, rectangle or square to remove other components, such as SOT-223 packaged transistors or SMT DIP packaged devices.

Making it Happen

Refer to Figure 2. As the leads heat and the solder re-flows, quickly add more solder to flood the area. I use Kester rosin-core solder, in a 63/37 (tin/lead) alloy. The component will float, and you can use a wiping action to flick the component away from its mounting pads.

Next, a length of solder wicking is used to remove excess solder from the board, as shown in Figures 3 and 4. The flux can also be removed with some alcohol and a little scrubbing.

The removed chip resistors ended up stuck to the 20 gauge bus wire. Although a bit discolored, these little bits can also be cleaned up with solder wick and alcohol, and be reused in another project. Of course, the little chip resistors are cheap enough to go into the trash bin (the hazardous waste bin). If the component were more valuable, such as a PIN diode or a transistor, however, it would be worth saving.

SMT is Here to Stay

This is another chapter in the *don't be afraid to use surface-mount components* story. As electronic products get more complex and component densities increase, SMT is the only way to go. Experimenters must practice using (and repairing) this construction method, and become comfortable with using these types of components.

By the way, the 24 GHz project I am referring to is discussed on a Yahoo! interest group site started by Frank Kelly, WB6CWN, of the San Bernardino Microwave Society (SBMS).[1]

[1]**groups.yahoo.com/group/24GHzHam/**.

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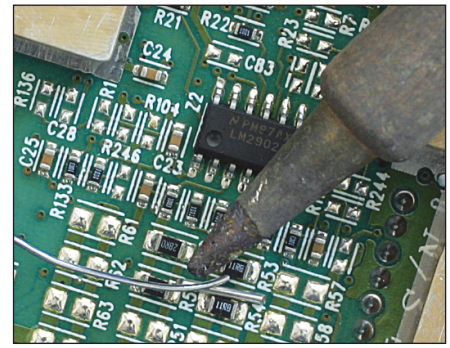

Figure 2 — As the component heats and solder begins to reflow, quickly add more solder to flood the component area. The component will float and you can flick the iron tip to push the component off of its pads.

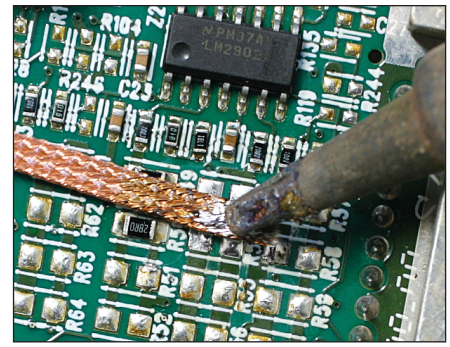

Figure 3 — Remove the excess solder and flux from the board with solder wick. Additional scrubbing with a swab and alcohol will remove the flux residue.

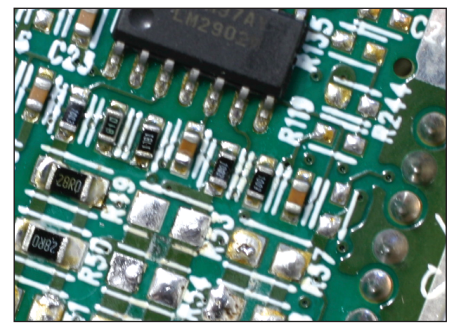

Figure 4 — The board should look like this. Two 0603 size resistors have been removed, and the cleaned board is ready to receive two new resistors. QST