Considering the two schools of thought for the angle at which the solder nozzle leaves a header strip.

This is the first in a series of columns discussing tips and tricks for using a selective soldering machine.

When soldering a double row header, or similar part, the solder can easily bridge at the end where the solder nozzle comes off. I don't know the technical term for this but I call it the "drag off." There are multiple arguments for the way you can drag off the end of the double row header. The most common recommendation is to drag off at a 45^0 angle.

I don't necessarily agree with this. I found greater success dragging off parallel with the double row (in other words, straight). The key here is the speed you drag off at. The slower the better. (You can go too slowly though, so be careful. If you go too slowly, you'll melt the header you're soldering.) More important, you need to use that same speed across the entire header. The trouble is, when the nozzle changes speeds or angles, it stutters, but not much. It's almost imperceptible, but if you look closely, you'll see it. I don't know that this is necessarily what causes the bridging, but I suspect it is. So what we do more often than not is drag straight off the double row headers at 0.200" per second.

Now, after explaining all of that, I must point out that sometimes it is still necessary to drag off at a 45^0 angle. Take a look at **Figure 1**. You'll see two double row headers. The one on the left we drag off at a 45^0 angle. The one on the right we drag off straight.

FIGURE 1. To avoid solder bridging at the end of a header row, consider dragging off at a straight angle, instead of at 45°.

You'll notice that on the double row header where we drag off at a 45^0 angle, the pivot point is right at the last two pins, while still barely touching the previous two pins. What's happening here, as best I can understand, is that we change all the surface tension of the solder wave. We now have four pins all tugging at the solder as it's dragging off. This causes the solder to want to adhere just to the pins and not to fall back onto itself. That said, I've still had better success dragging off at a straight angle, without "stutter stepping" on the last four pins.

To sum up, try dragging off at a straight angle, making sure to go slowly over the whole double row header. We find 0.200" per second works best. If you get inconsistent results with that technique, try dragging off at a 45^0 angle, making sure your pivot point is adhering to the last four pins to use them as tension against the solder bridging itself.

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