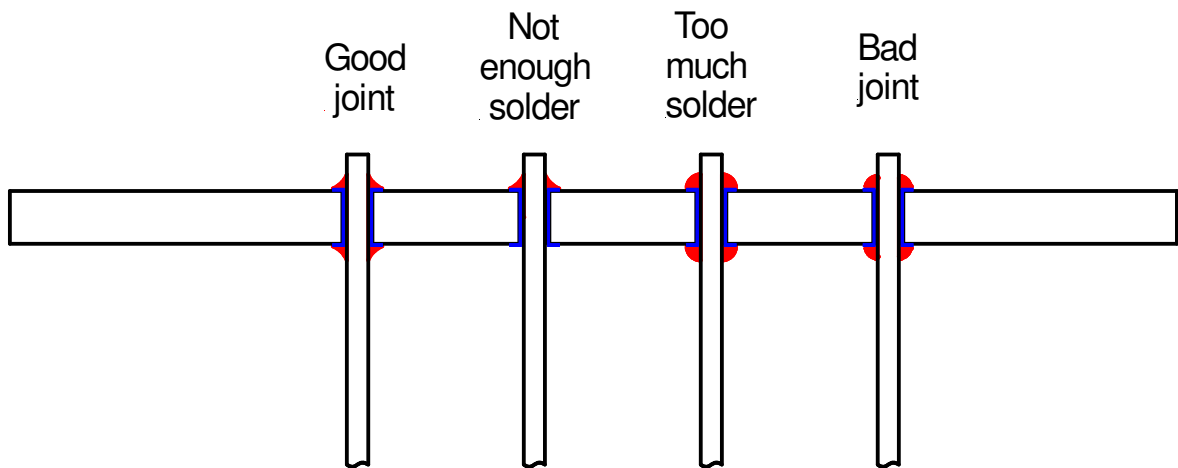


Soldering Tips

A good solder joint is one in which the solder "wets" both the component lead and the copper circuit-board pads. With the proper amount of solder applied, the solder will have a concave fillet around the wire on the soldering side, and will be visible on the component side, surrounding the component lead. If too much solder is used, the solder will have a convex surface, which is not bad in itself, but makes it difficult to know if you have a good joint. A bad joint in which the solder does not wet the wire or the pad, will always assume a slightly convex shape, which can be hard to distinguish from an over-filled joint. Excess solder can be removed with solder-wick material.

Soldering Side



Component Side

As you begin to solder the joint, rosin from the core of the solder melts and quickly flows over the solder pad and down the component lead, preparing them for the solder to make a good connection. As the solder melts it is drawn by capillary action through the hole in the board and slightly up the component lead on the other side as just enough solder is added to complete the joint.

The soldering iron is held on the joint for perhaps a second longer to cause the flux to boil (watch for this) and convert from a liquid acidic material to something which becomes a brittle plastic-like solid when it cools. Then if the iron is removed quickly, the solder will be able to assume the desired concave shape before it cools. The converted rosin, especially if from non-activated or mildly activated or no-clean fluxes will be a

very good, non corrosive, insulator and may be left in place without harm. Or it can be flaked off with the tip of a scribe if appearance is important. Washing with a flux-remover is not necessary, or maybe not even desirable, as there is always the possibility of adding contaminants to the board surface in the process.

Best results will be obtained with 60-40 or 63-37 Tin-Lead solder. The FBV circuit boards use Tin-Lead plating and will solder much more easily using Tin-Lead material.

At Hewlett-Packard, when we were having circuit board surface leakage problems the process engineering folks passed along their method for cleaning boards, which might be useful if you have to deal with a board you know is contaminated.

1. Clean the solder side of the board with a high-quality flux remover solvent. When I was doing this we used trichlorethylene or Freon, though one can't use those today.
2. Let that dry and follow by flushing the surface with dilute, chemically pure ammonia to neutralize any remaining organic acids.
3. Then finish up with hot distilled water to wash off ionic salt residues, then let the board dry. I would expect it would take a day or two to dry completely and perform like new.
4. To speed drying, the board may be rinsed with 99% isopropyl alcohol. This high concentration can be obtained from some chain drug stores and from some Wal-Mart stores. The more concentrated it is, the better job it will do to absorb and remove any residual moisture.