TIPS & TECHNIQUES FOR

SOLDERING COPPER

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1. MAKE YOUR SEAMS TIGHT & CLEAN — Clean and tight seams are essential: solder much prefers bright copper with a very close fit. Lap seams should have a minimum 1" overlap and no gaps larger than 1/16". Install only as much copper as can be soldered by the end of the day. Sloppy or dirty seams take much longer to solder: the extra time spent making a clean seam will pay dividends when soldering. Figure 1 shows what a good lap seam looks like, Figure 2 shows a good flat-lock seam.

2. RIVETING MADE EASIER — We carry self-drilling, metal lath, pan-head screws, size 8, about 1/2" long, in our pouches or rivet boxes — they hold the sheet or panel in place, can be easily removed, drill exactly the correct size hole for standard rivets, and can be reused indefinitely. Install the screws along the entire length of a lap seam working from the bottom to the top, then remove each one and replace with a rivet: you won't get copper shavings stuck between the sheets since they're held tight together. Put your drill bits back in the truck — you won't need them.

3. PEEN DOWN YOUR JOINTS — Even the best seams always have some gaps, slightly protruding rivet heads or irregularities which require extra attention. Use the well mushroomed head of a wide brickset to gently tap lap seams and rivet heads flat, taking care not to dent the joint. The wide blade of the brickset is handy for getting corners of box gutters tight. We go over flat-lock seams first with a Nupla 4 lb. dead blow hammer and then again with a 2-3 lb. drilling hammer with a slightly convex face, hammering the leading edge of the overlying panel flush with the adjacent panel. This allows the soldering iron tip to more easily bridge the flat-lock seam.

4. FLUX IT — Get some Stay-Clean Liquid Flux by Harris: it works much better than Ruby Fluid. Don't dip your brush into the quart container or you'll dirty the whole quart: we decant a half-finger at a time into a small glass container (baby food jars are great) and work from that. You can find Harris Stay-Clean at a good welding supply store (Airgas, etc.).

5. GET YOUR IRON HOT — Good soldering is done with the solder flowing in the liquid stage, not the plastic stage. The solder should look like you've laid a ribbon of liquid mercury on the copper (see Figure 3). If you're getting ridges in the finished solder, turn up your iron and slow down.

6. KEEP YOUR SOLDER CLEAN — Solder bars are a bit like welding electrodes — they like to be kept clean and dry. If you leave the solder roll around in your truck or gang box, you'll get impurities on the bars which will accumulate on your iron tip and require extensive cleaning.

7. DIP YOUR TIP — Here's how to make yourself a good iron dip: combine 3 parts tap water with 1 part Ruby Fluid in a medium sized glass pickle jar with a tight fitting lid. Quickly dip your hot soldering iron tip in this mixture after soldering each joint and watch the dross come right off, leaving the tip clean and bright — no more brushing or wiping or cleaning with sal ammoniac. Also useful for cooling down your iron if it gets too hot. Figure 4 shows iron dip & flux jars.

8. USE AN ELECTRIC IRON FOR VERTICAL JOINTS — We use a 550-watt American Beauty soldering iron w/ chisel tip for soldering our vertical joints: if you hold the iron perpendicular to the joint, press the tip into the seam and work from top to bottom, the joint can be soldered beautifully in one pass. The vertical joint in Figure 5 was soldered with an electric iron. Since these irons are engineered for shop work, they don't get hot enough in ambient temperatures below 65 deg F. and, under those conditions, we revert to propane fired irons.

9. USE YOUR IRON CORRECTLY — Both lap and flat-lock seams should be soldered in one pass with the hot iron placed across the joint so that the most heavily massed part of the tip is on the folded or "high" side of the seam. Remember the heat is transmitted from the soldering iron tip to the seam through the puddle of molten solder bridging the joint, so as in welding, watch your puddle and work along continuously.

10. WASH YOUR JOINTS — If joints are not washed properly after soldering, the flux remains active and will leave a green discoloration on the adjacent copper. We keep a pump sprayer filled with tap water and a few squirts of dish soap, and spray joints and adjacent copper copiously and scrub thoroughly. This works quite a bit better than the usual baking soda/water scrub. The sprayer acts as an emergency fire extinguisher as well. The sprayer & soldering outfit are shown in Figure 6 at left.

Figure 6

[For more about Paulin, see Project Spotlight on page 22.]

All photos by Christopher Paulin.


Figure 1


Figure 2

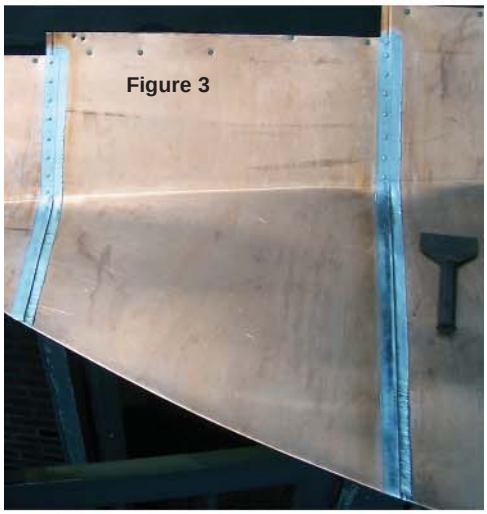
Figure 3

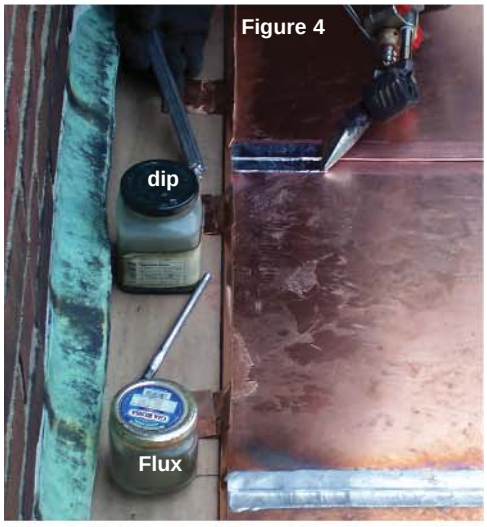

Figure 4

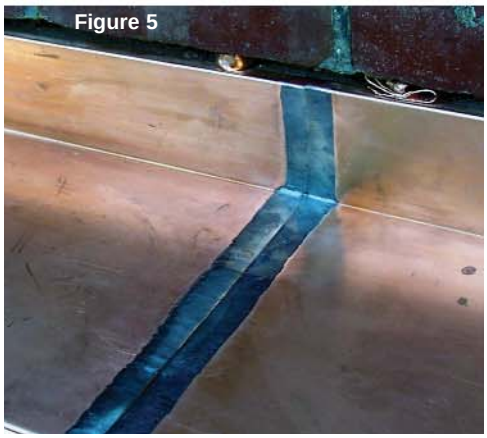
Figure 5