

# Mechanical Soldering

*Written by: Christopher Dahle, Del Norte, CO, USA*

**P**roperly done, soldering is the best way to attach clevises to music wire, harden cable for cutting, or assemble landing gear components. Once this valuable skill is acquired, there will be dozens of things to solder.

**B**riefly, the steps to soldering are:

1. Clean everything thoroughly
2. Wire wrap, clamp, or otherwise thoroughly secure every part of the assembly
3. Liberally apply paste flux
4. Apply heat until the flux vaporizes
5. Apply solder to the joint, not the iron or flame
6. Continue to apply heat until the solder flows
7. Remove heat
8. Remove solder
9. Douse with liquid flux
10. Clean everything thoroughly

**A** propane torch can be used for everything except electronics. Everything should be cleaned with emery paper, a fine wire brush, or a ScotchBrite pad. All of the components must *shine* before soldering is started. If wire is being used to wrap the components, all enamel coating *must* be removed from the wire.

The components are assembled and secured by clamping or wire wrapping so that nothing can move. Both hands must be free while the soldering is being done. For holding small items, like soldering clevises to music wire, hemostats can be used to hold the parts, which are then clamped in a vice or other holding fixture. Landing gear assemblies can usually be arranged to be free standing but it is better to clamp them down so they cannot wiggle.

**A** good flux is very important, especially if the parts are not quite clean. The purpose of the flux is to clean the surface and to inhibit corrosion while the heat is being applied. Do not rely on the flux but ensure that everything is very clean before proceeding. NoKoRode brand soldering paste comes in a neat little tin and does an excellent job.

**A** good choice of solder is 50/50 (50% lead and 50% tin) wire solder. Because lead solder is now illegal for plumbing use under the UPC, it is hard to find but it *is* available at some electronics supply and hardware stores. The lead free solders available at most home centers are harder to use because they require more heat. The additional heat promotes quick surface corrosion and reduces the chance of a strong solder joint.

**T**he process begins with dabbing the joint with flux and painting the joint with the torch flame. Heat is applied until the flux flows throughout the joint and starts to bubble or vaporize. When the solder is applied to an adequately heated joint it will begin to flow. It will displace the flux and will coat the surface to which the flux was applied. When the solder has flowed through the whole joint, the heat and the solder wire are removed from the joint.

**A**t this point, the joint is doused with a liquid flux like Kester All Purpose Liquid Flux. Flux is highly corrosive, so the joint, tools, *and* hands must be washed thoroughly when done.

**G**ood soldering skills are a pleasure to have and to watch. Like any other skill, it takes time to learn and develop but is well worth the effort.

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