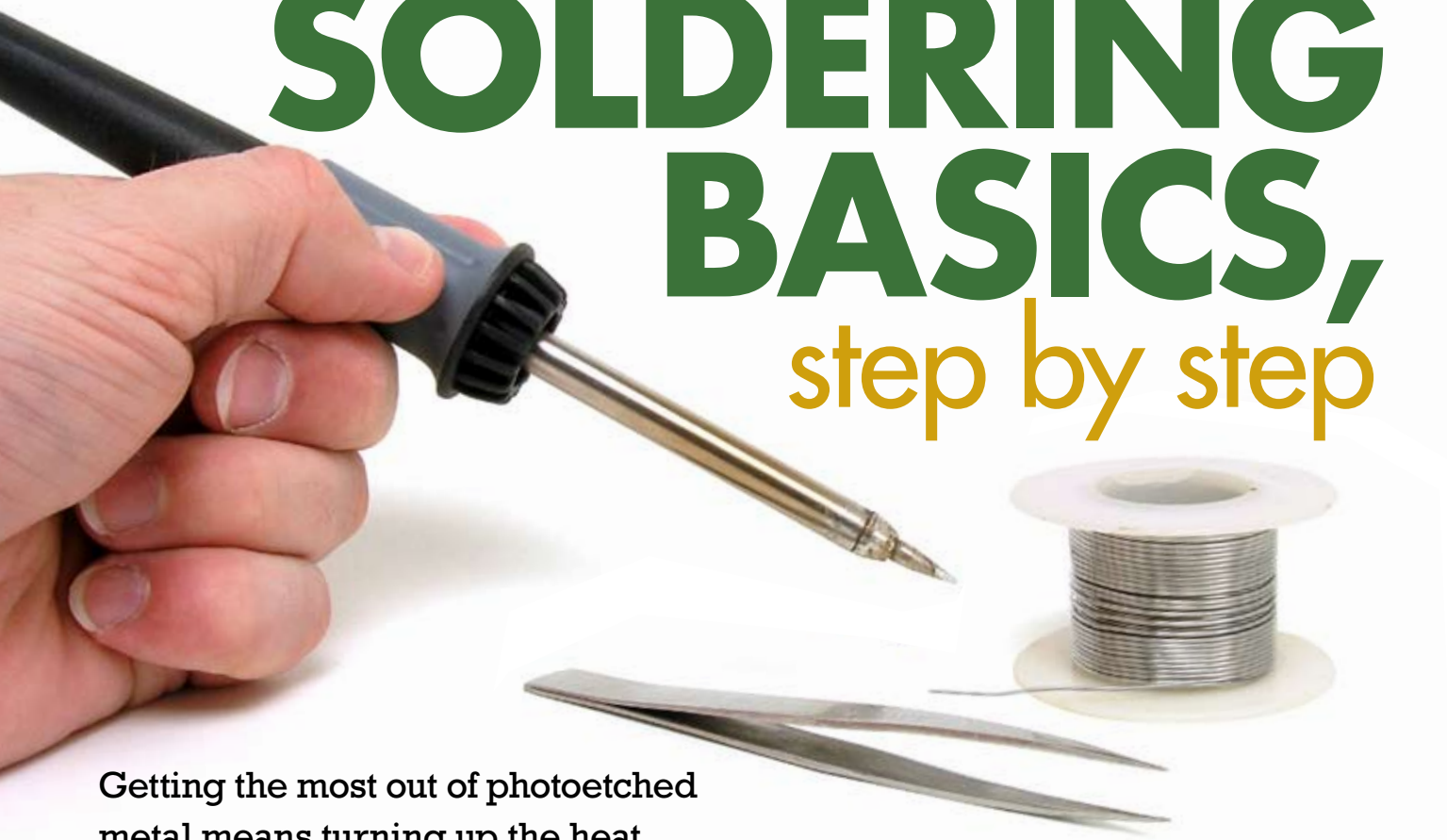
Skill Builder

by Rick Lawler

SOLDERING BASICS, step by step



Getting the most out of photoetched metal means turning up the heat

For some modelers, photoetched metal is the scourge of the hobby. Others embrace the delicate brass bits. Most seem to fall somewhere in between, with a sort of reluctant acceptance that, at some point, they will use photoetched metal on a model.

I was one of the latter: Although I could see the potential of using the thin metal accessories, I could not seem to get over some of the technical hurdles.

Starting slowly, I built up my experience with photoetched-metal parts. Moving on to complex assemblies, I quickly came to realize super glue had its limitations. And these shortcomings would make it difficult to take my work to the next level.

If I was to truly embrace photoetched metal, I needed to come to grips with the soldering iron. Boy, was I apprehensive! In my mind, soldering was an advanced technique reserved only for a select few who had "traveled to the crossroads."

Turns out, it's not that hard if you take it step by step and practice. Start with scrap photoetched metal, not a key project.

What you need

There are a bunch of soldering tools available, some with more features, but they all serve the same purpose: Melting the solder for a strong, durable join between two metal parts.

My tools are basic: An inexpensive 40-watt soldering iron, solder, flux, pliers, tweezers, single-edge razor blades, sandpaper, steel wool, and an Etch Mate folding tool, **1**.

Tinning

Tinning is the process of adding a thin layer of solder to the parts being joined prior to actually sticking them together.

Begin by applying flux to the surfaces to be joined. Flux dictates where solder will stick. I use a small brush to apply flux to the area where I want the solder to flow, **2**.

Next, I cut small chips of solder (a new hobby knife works well) and position them on the flux-coated areas, **3**.

Finally, I touch the tip of the soldering iron to the flux near the solder chips. Soon, the flux will sizzle and bubble. Then, as the surface temperature rises, the solder chips liquefy. Keeping the iron's tip in contact with the molten solder, I spread it over the fluxed area, **4**.

Assembly

To join the parts, I apply a little flux to the tinned areas of each piece. Then, holding the parts together, usually with tweezers, I apply heat. The flux sizzles as the solder liquefies and sweats between the parts, **5**. Removing the hot iron stops the process. The result is a tight bond.

Simple cleaning of the area may be required if the solder has oozed from between the parts. Light sanding with fine-grit paper or steel wool is usually all that's necessary, **6**.

If small gaps remain, squeezing the parts together while heating the join will eliminate them, **7**.

To add small parts, tin the attachment point of the detail, **8**,

SAFETY

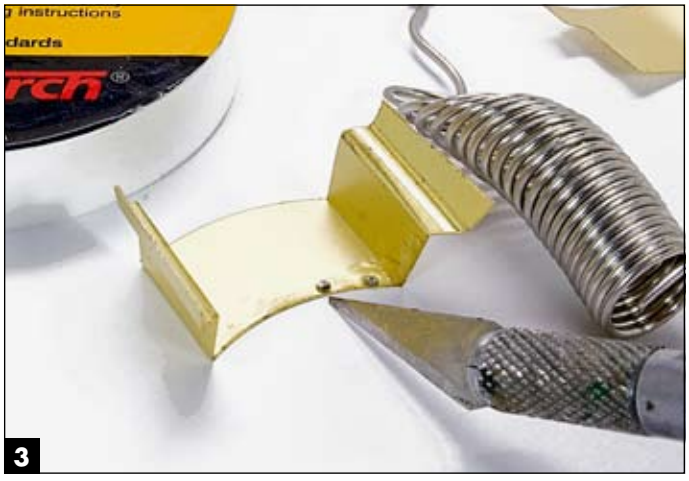
Soldering involves heat, molten metal, and chemicals, so there are potential hazards. It's a good idea to wear eye protection. Cotton clothing that covers arms and legs, as well as closed-toe shoes, can prevent burns from runaway solder, which melts at more than 350 degrees Fahrenheit. It goes without saying that the iron's tip is hot. Don't touch it, don't leave it on while not working, and use a stand – don't lay it down on your workbench. Also, work in a well-ventilated area.

1

Tools of the trade: Rick's soldering arsenal includes a 40-watt soldering iron, solder, and flux, as well as sandpaper, files, an old paintbrush, a hobby knife, and tweezers. A folding tool, such as Mission Models' Etch Mate, is great for working with photoetched metal.

2

Rick paints flux along the mating edges of Aber's Panzer IV turret stowage bin. Precise flux placement keeps solder where it belongs and minimizes cleanup.



3

Rick cuts chips or slices of the soft solder and places them in the flux on the part.

4

Tinning: Heating the metal part with a soldering iron, Rick melts the solder, then spreads it over the mating surfaces.

5

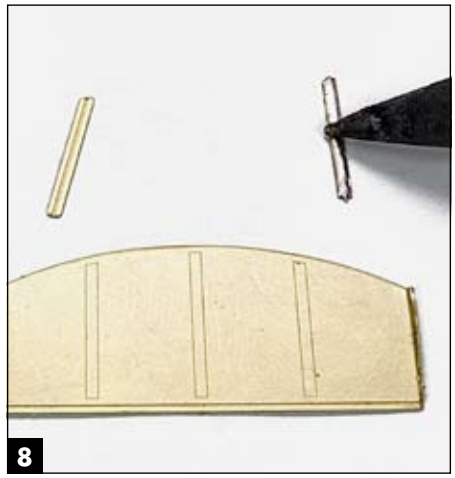
The moment of truth: Holding the tinned parts together, Rick heats the join with the iron, liquefying the solder on both parts and bonding them.

6

Cleanup is easy. Most joins require only simple sanding to smooth the solder and blend the components.

7

To take care of gaps, Rick squeezes the joint closed, then heats it to liquefy the solder.



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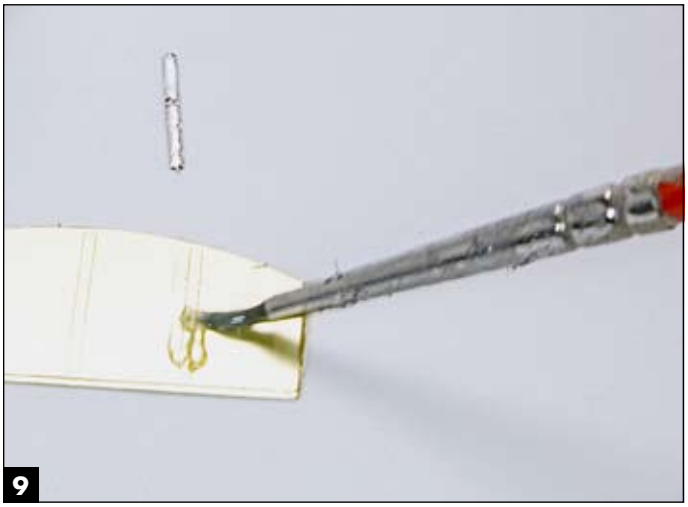
To add ribs inside a stowage box lid, Rick tins the attachment side …



9

… then paints flux onto the larger part where the rib will attach.

10

After placing the part, Rick touches the iron to the back side of the detail, melting the solder and binding it to the lid.

Glossary

ANNEALING: Heat treatment that alters the microstructure of a material, causing changes in properties such as strength and hardness. This technique is especially helpful in softening the brass to ease bending.

FLUX: Chemical cleaner that removes oxidation from surfaces to be soldered, seals out air (thus preventing further oxidation), and improves the wetting characteristics of liquid solder.

SOLDER: Fusible metal alloy; easy to find at electronic, hardware, and home improvement stores. It is the material that joins metallic surfaces.

TINNING: The process of adding solder to mating surfaces before joining them.

and brush flux onto the larger part, **9**. Using tweezers, position the detail solder-side down. Touch the iron to the part; the heat will transfer through the thin brass, liquefying the solder on the underside and attaching the part, **10**.

Practice, practice, practice

There you have it: Soldering in a few easy steps. As with any modeling technique, practice makes perfect. Don't train on shiny new kit parts – find some unused or spare parts. Scraps are great sources of material to practice every aspect of working with photoetched metal, from bending to soldering.

If there is one point to remember, it is to be restrained with the amount of solder you use. The thinnest coating yields more than enough holding power for modeling. Using too much solder results in buildup, less definition, tougher cleanup, and, worst of all, destroyed parts.

The good news: If you make a mistake, you can unsolder parts. Just add a little flux to the area, heat it, and pull the pieces apart. This is especially handy if you should happen to attach a part incorrectly or it becomes crooked during soldering.

I hope I've taken a little of the mystery out of soldering by describing these simple techniques. Enjoy the brass bits, and happy modeling! **FSM**