A supplement to FineScale Modeler magazine

# Build Better MODELS

Great how-to advice from FSM's team of experts!

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# GET STARTED ARBRUSHING

### The secrets of choosing and using your first airbrush

By Matthew Usher

irbrush. It's a simple word that easily intimidates a lot of modelers. If you've been reading FSM for two decades or two issues, you've seen "airbrush" pop up in almost every article. Learning to use an airbrush is probably the single most important step toward building better models. After a little practice, you'll be able to apply beautiful finishes in whatever color you choose.

You'll be able to apply complex camouflage schemes, apply subtle weathering effects, and other special finishes that would be impossible with spray cans or brushes. It's an ideal paint applicator for scale modeling.

Twenty years ago, airbrushes were widely used for photo retouching and illustration work. Nowadays that work has gone to computer software, and it would be easy to think that the airbrush might go the way of the rotary phone or the wind-up watch. Quite the opposite is true, thankfully. Airbrushes are still in use every day in new roles, doing everything from decorating nails to applying spray-on suntans. There's a staggering variety of airbrushes available from plenty of manufacturers.

That's good news on one hand, but it does make choosing your first airbrush more difficult – which one is best for modeling?

### Single-action or double-action?

Generally speaking, airbrushes can be divided into two groups: single-action and double-action. With a single-action airbrush, the fingertip button controls only the supply of air. The paint flow must be adjusted separately. On a double-action airbrush, the button controls the airflow and the paint flow.

Double-action airbrushes give you the most control over the spray pattern, but I wouldn't recommend one for a beginner. How can that be? Isn't a *double*-action airbrush *twice* as good? Well, yes and no. Double-action airbrushes are complex, hard to clean, and can be tough to handle if you've never airbrushed before. If you're looking for your first airbrush, I'd suggest a single-action model from an established manufacturer, **1**. Single-action airbrushes are less expensive, are easier to clean, **2**, and are still up to the task of most modeling work.

(This is not to say double-action airbrushes don't have their place in modelbuilding. As you progress, you can always add one or more to your collection of tools. Most intermediate and advanced modelers have multiple airbrushes, the same way woodworkers will have more than one saw and mechanics will have more than one screwdriver.)

### Metal or plastic?

You can find single-action airbrushes that are all-metal, a combination of metal and plastic, and all-plastic. I'm a little "oldschool" in my thinking, and prefer a mostly metal, traditionally designed airbrush. However, I do have friends who love their lightweight, high-tech all-plastic airbrushes. You can get great results with any version, but what kind of "feel" you want is something to consider.

### Color cup or bottle?

Airbrushes hold their paint supply in either open-top color cups or bottles that attach to the airbrush. (Some airbrushes can handle both.) If you have a choice, pick the airbrush that can handle a color bottle. Bottles hold more paint, and since they're closed on top, you'll be less likely to spill paint. On a related note, if you're lefthanded (like me) make sure you pick an airbrush that will work in either hand, **3**.

### Putting the air in airbrush

When you think about investing in your first airbrush, don't forget to factor in the air supply you'll need to operate it ("air" is right there in the name, after all!). A lot of entry-level airbrush sets include an air line, a simple regulator, and a can of compressed-air propellant, **4**. Propellant works fine, but that little can won't last very long, and buying replacements can get expensive quickly. Shop for a diaphragm compressor that's designed to work with airbrushes. These are relatively quiet and will provide all the air you'll need for many years. One with a regulator (or one that can have one added later on) is even better, **5**.

### Ask around

It never hurts to ask other modelers which airbrush they'd recommend. While model building can be a solitary activity, there are online forums where modelers gather to talk about their craft (the best by far is at www.FineScale.com, by the way). Before you take the leap and buy your first airbrush, log in and ask other modelers what equipment they use, and what they like and dislike about it. The FineScale Forum is subdivided by subject matter, so if you only model armor, you can talk directly to other armor modelers. There's also a very active general "Painting and airbrushing" section. The FSM Forum has almost 40,000 registered users worldwide, so you're bound to get plenty of answers from modelers of all skill levels.

### Spray booths

A small spray booth, **6**, is a fantastic investment for a number of reasons. First, by drawing air through the area where you're painting, the spray booth keeps any overspray from falling on the model.

Second, the fan and filter capture paint particles that might otherwise float around in the workshop where you (or your family) could inhale them. Enamel and lacquer fumes are unquestionably dangerous, and even "safer" acrylics can contain ammonia and other ingredients you don't want to inhale. Even with a paint booth, a respirator mask and eye and skin protection are a good idea, **7**.

If your paint booth is vented to the outdoors, it will remove paint odors from your workshop. This is especially important when you work in a room used by the rest of your family, and if you use strongsolvent-based paints such as lacquers, the ventilation the booth will provide will be vital to your health. A good rule of thumb is if you can smell the paint while you're airbrushing, you're inhaling it, and you need to step up your ventilation and respiratory protection.



A straightforward single-action airbrush is an ideal way to get started airbrushing!



This metal-and-plastic airbrush has interchangable paint and air nozzles for everything from moderately fine to heavy paint coverage. It can be fitted with a bottle or a color cup.

On a lighter note, a paint booth can help you keep dust out of your finishes. I turn my booth fan on about 20 minutes before I plan to paint, and the fan helps remove any dust that's in the air.

### Preparing the paint

You'll absolutely need to thin paint before you load it into your airbrush. Straight from the bottle, model paint is too thick to flow through an airbrush's tiny nozzle, and even if it does, it'll produce a nasty looking finish. Thinning will help the airbrush atomize the paint into a fine spray.

Don't listen to the guy who says "I just jack up the pressure to 45 pounds and spray paint full strength." Your best bet for obtaining a high-quality finish is to thin the paint and apply it as recommended by the paint maker and the airbrush manufacturer.

For paints without manufacturer recommendations, experiment by cutting the paint 15 to 50 percent with thinner. Different paint brands and even different colors within a brand require varying



Because of their simple construction, singleaction airbrushes are easier to clean. This paint nozzle is big enough to see inside; when it's shiny, it's clean!



This single-action Testor Aztek airbrush can be adapted for left- and righthand operation, and can also be fitted with a number of color cups.



A good compressor designed for airbrush work (like this Iwata Smart Jet) is a fantastic investment. This one operates quietly, and features a regulator and pressure gauge. Also, it's portable and easy to store, in case you don't have a dedicated work area.



A paint booth with an exhaust to the outside makes it easy to use a variety of paints, from acrylics to lacquers. This is a "downdraft" booth, where fumes are drawn down through the booth's floor.

amounts, but generally, light colors must be thinned more than dark colors because light paints have more and heavier pigment in them.

If you have problems with your airbrush clogging, try straining the paint after you thin it. You can strain the paint through a fine tea strainer, an enamel washing strainer, or fine carburetor screening. Some manufacturers offer in-bottle strainers that fit inside the paint bottle, over the siphon tube. It's amazing how much material straining will remove from a new bottle of paint, and even a tiny lump can bring your painting session to a halt.

### Preparing the model

A model you're going to airbrush must be clean, dry, and dust free. Even the oil from your fingertips can affect a freshly applied finish. A little dish soap and plenty of water will clean things, or you can use Floquil's Plastic Prep cleaner.

Holding the model during painting is important, because you'll have one hand tied up with the airbrush, and there's nothing worse than dropping a freshly painted model.

Depending upon the shape of the model, I use wire coat hangers, a length of dowel, or an inexpensive plastic turntable to hold the model. When other options won't work and I have to hold the model with my hand, I wear latex examination gloves to keep me from painting myself. Latex gloves are available inexpensively at most drug stores, and when you're done painting, you can toss them. Investing in a stand for the airbrush is a great idea, too, **8**.

### Starting to paint

With the paint and the model prepared, start the compressor, depress the button on the airbrush, and (if you can) adjust the pressure to 20 psi while the airbrush has air flowing through it. You'll find you have the best control at pressures between 15 and 20 psi. Very thin paints, such as colors thinned for weathering, Future, and Testors Metallizers, can be applied at between 8 and 10 psi.

Now load the paint into the color bottle and practice spraying on a box top, an empty soda can, or (best of all) a scrapped model. Vary the setting of the color control and adjust the airbrush until you can apply a smooth, even coat of paint.

Control – of the pressure, spray pattern, and paint consistency – is what this tool is all about, and you should be able to adjust the airbrush until you can paint along at your own pace without hurrying. Keep the airbrush moving so you don't cause puddles or sags.

### Fire away!

Now it's time to try your hand at airbrushing a real live model. Hold the airbrush 3" to 6" from the surface you're painting, and keep the airbrush moving while you build up thin coats of paint. I usually start by painting recessed areas first (such as landing gear wells and the seams where wing roots meet the fuselage), then I finish up by painting flat or gently rounded surfaces.

While you're spraying, remember to stop occasionally. There's a tendency to be drawn into the work when you're airbrushing, and this can cause you to apply too much paint, especially when weathering. The solution is simple: Stop every now and then, put the airbrush in its stand, and take a break for a couple of minutes.

### Troubleshooting a clog

Paint clogs are a common problem. Straining the paint will eliminate most clogs, but when it happens (and it will), keep your temper in check. Put the model aside (someplace where you won't spill something on it or knock it over), turn off the compressor, and determine the cause of the clog. The places to look, in order, are:

- **1.** The paint-nozzle tip, or the tip of the needle
- **2.** The siphon tube, or the color cup
- **3.** The air hole in the top of the color bottle. If this is blocked, the paint won't flow

Regardless of the cause of the clog, the remedy is usually to stop and clean the paint passages of the airbrush and paint bottle siphon before continuing.

### **Cleaning and maintenance**

As soon as you're through painting, move the model safely out of the way and clean the airbrush immediately. Most problems with airbrushes are caused by lack of thorough cleaning, and it's easiest to clean right after you've finished painting. Be aware that the instructions for your airbrush may not take into account the kinds of paint we use for modeling, which, compared to artist's paints and inks, are closer to glue when they start to dry. You've got to get every bit of paint out of the airbrush before you put it away.

Start by removing the color cup or bot-



Even with a paint booth, it's never a bad idea to invest in a protective mask. Eye and skin protection go hand-in-hand.



Where's that extra hand when you need it? A clamp-on workbench airbrush holder is a lifesaver, particularly when you're using a color cup.



When used and stored properly, hardwarestore lacquer thinner makes a great all-around airbrush cleaner.

tle. Open up the paint nozzle, and spray the paint left in the airbrush into a paper towel. Then rinse the color cup or bottle with solvent, and fill it with clean solvent, **9**. Spray solvent into a rag, then hold the rag against the tip of the airbrush, deflecting air back into the paint passages.

Complete the job by cleaning the paint passages with cotton swabs and pipe cleaners. Never force the pipe cleaner where it won't fit – doing so can ruin an airbrush – but gently poke the pipe cleaner wherever you can. On internal mix airbrushes (such as the Badger 200), make sure every last trace of paint is removed from the needle and the needle bearing; I've seen airbrushes literally welded together because paint was allowed to dry on the needle and in the needle bearing. This kind of trouble is easily avoided and almost impossible to fix without damaging the airbrush.



Always keep track of the little wrenches that are supplied with the airbrush. This Aztek one helps disassemble and clean the airbrush.

### **Final words**

There's plenty to learn about airbrushing beyond what's presented here – I'm still learning tips and tricks after more than 20 years. Beyond what you take from this article, keep a couple of things in mind as you go forward. First, the best way to get better at airbrushing is to practice, and there's nothing better than practicing on a model. Knock together a few sale-table kits and fire away. You'll be able to experiment without fear of damaging a model you've invested months of work in.

Next to practice, the best thing you can do to maintain your airbrush is to clean it meticulously every time you use it. A clean airbrush functions properly, is ready to go when you're ready to paint, and will last for years and years. Take care of it, and it will help you take care of your models.

Now go get started – good luck, and good airbrushing!



### Organize vorkbench

Build this simple, inexpensive tabletop tool caddy

By Mark Büchler

love tools! I can't have too many.

The problem is, the more tools I get, the harder it is to keep them organized. Stashing them in a drawer or box is impractical; I spend more time searching for necessary implements than building models. I want my tools readily accessible in plain sight.

I solved the problem with a low-tech, dirt-cheap design using items available at any hardware store.



Shopping basket contents: precut sheet of clear acrylic, assortment of 3/4" and 1" PVC pipe connectors, and a tin of PVC glue.



Pipe connectors come in various lengths and diameters appropriate for different modeling tools and accessories.



Pipe end caps make excellent paint- or gluebottle holders, preventing tips and spills.



First, I dry-fitted the components to the clear acrylic sheet, reworking the layout until I was happy.



I attached the PVC pipe components to the base. Pipe glue is very aggressive and sets rapidly, so I positioned the parts quickly. Always wear gloves and eye protection and work in a well-ventilated place when using PVC cement.



After about 30 minutes, I loaded up the caddy with tools. A piece of rubber or cork in the bottom of each tube protects the tool points.



End caps at the front edge of the caddy are a great way to prevent knocking over expensive paint bottles.



A small, snap-lid box glued to the base provides storage for spare hobby-knife blades.



I finished my caddy with a tray from a discarded knick-knack box, a nifty place to stash model parts during construction.





## Cutting tool roundup

### Outfit your workbench with the tools you need

By Matthew Usher



t's an ironic fact of model building that before you glue parts together, you usually have to cut some apart. Not surprisingly, having the right tool for the job makes building a lot more enjoyable, so here's a look at the most commonly used knives and cutters for model building.

A small pair of sharp scissors makes cutting decals and masking tape a whole lot easier. I found this pair in the needlework section of a craft store, and I have a similar pair with curved blades.



Cutting shears are a great all-purpose tool, but they're especially handy for removing delicate parts from the sprue. This pair is from Xuron (www.xuron.com). Precision shears like these save lots of time at the workbench. What little sprue remains on the parts can be trimmed away with a hobby knife.



My first modeling tool was a hobby knife with a pointed No. 11 blade; it replaced my trusty Cub Scout pocket knife. Now I keep several knives on my workbench and I use color-coded handles to tell them apart easily. When the blades wear out, I place them in a plastic "sharps" container. You may have seen a sharps container in a doctor's office; they're normally used to dispose of syringes. With a sharps container, the old blades are stored safely, and when the container's full, it's disposable.



Although it's especially handy for grinding, drilling, and sanding, you may not think of your motor tool as a cutting tool. But if you need to cut more substantial materials, such as music wire, you may want to outfit your cutting tool with a mandrel and cutting discs.



A general-purpose razor saw and a miter box will serve you well, particularly if you're thinking about doing conversion or scratchbuilding work. There's no easier or more accurate way to cut a right angle in styrene stock.



When you use a motor tool or most of the cutters outlined here, it's always a good idea to wear a good pair of safety goggles, which are available inexpensively at hardware and home stores. Cutting wheels can break, and tiny bits of wire and plastic can go flying – protect yourself properly.

### Safety first

Few things are sharper than a new hobby-knife blade, and few things can tear you up more quickly. I've gone through plenty of Band-Aids in my modeling career, and once even ended up in the emergency room under the care of a plastic surgeon. I'll spare you the details, but I will tell you my wife almost fainted, and we could have filmed the model-building equivalent of a driver's-ed movie ("Red Workbench" starring Matthew Usher). In all seriousness, though, I made a stupid mistake with a common tool. The pain was considerable and I took a long, long time to heal. Bring up workbench accidents at a model-club meeting and you'll hear a wide variety of similar stories. Learn from our mistakes. All of the tools outlined here should be handled and stored with the utmost care.

### Improve CLEAR parts with Future



### Better canopies? They're soaking in it!

By Matthew Usher

ou've got to be kidding me. That was my first reaction when someone told me about using Future to improve the clear parts on my models. "Future? The floor polish you get at the grocery store?"

It's true. Among its many magical properties, Future not only makes clear parts appear "clearer," it also makes them easier to mask and protects them from dust and fingerprints. Really. Trust me. Here's a step-by-step guide to this easy-to-learn technique.



First, you'll need a fresh bottle of Future; look for it in the household section of your grocery store. A 27-ounce bottle like this one will last a long time on the workbench. To treat the clear parts in Future, you'll need to submerge them in it completely, so look around for a deep, wide-mouth container. I use an old salsa jar.



Remove the clear parts from the sprue, but leave a small section of the tree connected to the part.



The piece of the parts tree makes a perfect handle while you treat the part. Pick up the part with a good set of alligator clips or strong locking tweezers, and make sure it's held securely.



Here's the easy part: Submerge the part in the Future. Just dunk it in. Look for any air bubbles that might be trapped in the part's engraved details. If you see bubbles, turn the part over using the alligator clip and let them float out.



Once the part's thoroughly submerged and you're convinced there aren't any air bubbles, you're ready to remove the part. This is the tricky part. Slowly pull the part out of its Future bath. Removing the part slowly will allow the excess Future to flow back into the bottle and prevent runs. Use the edge of the jar to rest your hand; take your time. When you can, have a corner of the part be the last thing that comes out of the Future.



Here's why: No matter how slowly you remove the part, a drop of Future will probably remain at the last point to come out of the bath. If the drop's at a corner, you can drag the corner along a sheet of paper, and the excess Future will wick away. Look at the part while it's still wet – if the layer of Future has runs, dust, or looks uneven, give the part another dunk in Future and try again. If the coat of Future looks even and smooth, you're ready to let it dry.



I use an "extra hands" stand to hold parts while they dry. I also place them in a plastic storage container to keep the dust off. After 24 hours, the Future will be completely dry and the parts can be handled as usual. You can trim away the parts-tree handle and get to work. You'll be amazed at the smooth finish and extra clarity the parts will have. You'll also find that masking materials (like Bare-Metal Foil) will be easier to remove.



What happens if you're not happy with the coat of Future you've added? Dunk the parts in Windex. It'll remove the Future without harming the plastic parts.



Once you get the hang of dipping clear parts in Future, you'll be able to use it on all kinds of models and all kinds of parts, from windshields to headlights to periscopes and vision blocks. With a little experimentation, you'll find lots of new uses for Future on your models.

# Working with **PHOTOETCHED METAL**



Photoetched parts are a great way to add fine detail to almost any subject. Even basic parts, such as these engine-cover grilles on my Tiger I, really go a long way toward enhancing the model.

### TRIMMING AND CLEANUP



Photoetched parts arrive attached to a *fret*, the same way plastic parts come on a parts tree. Most photoetched parts are thin enough to cut loose with a sharp hobby-knife blade, but they have a habit of springing away and hiding in the carpet. To keep small parts from disappearing, put the fret in a clear plastic bag (if it isn't aready in one) and remove the parts with a pair of tweezers.



You can use a file or a sanding stick to remove any remaining attachment points – this is a miniature diamond file. File or sand in line with the edge of the part and you'll have less of a chance of bending it.

### Hints to help you get started and keep going

### By Matthew Usher

f you've never worked with photoetched metal detail parts before, you probably have a few questions about the best way to get going – the parts look great, but they're not going to behave like plastic ones. Here are a few tips to get you going in the right direction.



Regular plastic model cement won't work on photoetched parts, but there are plenty of other options depending on the application. Epoxy provides the strongest bond and allows you to adjust the parts before the glue cures. Gap-filling super glue is a good choice, too, and also provides plenty of strength. Water-based glues (such as Micro Krystal Klear and good old white school glue) are handy, too, when raw strength isn't a concern. I use white glue to attach photoetched emblems to car models – if I'm unhappy with the placement, I can remove the part and wipe off the glue with a little warm water on a cotton swab.

### FOLDING COMPLEX PARTS



Some parts, like this 1/32 scale Thunderbolt seat, must be folded into shape from the flat original. Making the folds in the right order is important, since photoetched metal is difficult to straighten once it's bent.



There's an easy way to practice folding the part without damaging it. Put the photoetched fret on a photocopier and run off a few copies.



Using a straightedge and a sharp hobby knife, cut out the paper copy and practice folding it up. When you're sure you're working in the right order you can move on to the metal original.



I decided to add Eduard's photoetched skirts to Tamiya's 1/48 scale Stug III. The parts are realistically thin, but they're a little too flat and factory-fresh for a vehicle that's been in combat for a while. Annealing the parts will soften them and make them easy to bend.



After trimming out one of the skirts, I heated it briefly over a candle flame.



Let the part cool slowly until it's room temperature. The annealing process removes the temper from the part. The metal will be softer and easier to bend with its springiness removed.



A little lacquer thinner on a cotton swab will remove the soot and discoloration from the part.



With the part softened, it was easy to bend in some wear and tear; annealing makes the parts look much more realistic. Using a hammer and a nail, I was even able to add a little small-arms damage.



At the other end of the spectrum, photoetched parts are a great way to add realistic trim to car models. After painting these Corvette enginecover grilles flat black, I polished them with a three-grit sanding stick from Squadron. The polishing left the paint in the recesses while giving the surrounding grilles a high shine. The grilles and the tiny emblems are attached to the model with white glue; using it gave me time to position the parts properly, and I could remove the excess glue afterward.



A variety of tweezers makes working with photoetched parts easier. Round-point tweezers (top) have a large gripping surface, and are ideal for large, delicate parts. Fine-point tweezers (center) can help place the tiniest parts. Locking tweezers (bottom) hold parts securely until you release them.

**COLOR PARTS** 



Eduard (www.eduard.cz) offers several photoetched-metal detail sets with color and fine details printed on the parts. A few are self-adhesive, too, making installation easier.



Eduard even offers photoetched-metal figures to man the decks of your ship models. These are 1/350 scale, and 1/700 scale figures are available, too.

### FORMING TUBES



This Fokker D.VII set includes photoetchedmetal cooling jackets for the aircraft's twin Spandau machine guns.



Mission Models' (www.missionmodels.com) Multi-Tool is great for shaping round and tubular parts accurately. Each stepped section is precision machined and laser-etched with standard and metric measurements. Anneal the parts first and they'll be easier to wrap around the tool.



The pointed end can be used to form conical parts, and it also makes a fine burnishing tool.

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