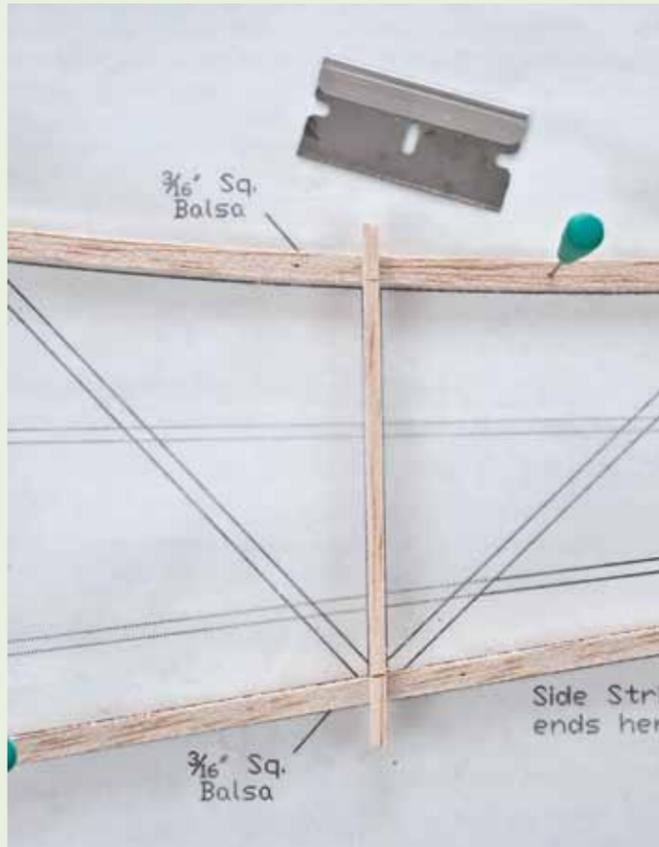


SCALE SCENE

Tools of the Trade

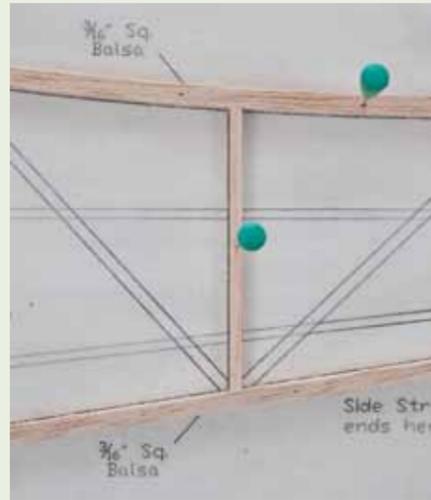
BY: Mike MacFarland



When cutting strips to fit, the trick is to place each piece where it will go and mark the cut by pressing lightly with the single edged razor blade.

The stick is then cut along the mark with a single edged razor blade, being careful to ensure a perpendicular cut with the chopping motion.

With practice and this technique, the sticks will fit tightly and your airframes will be strong and clean.



“Putty and paint make it what it ain’t,” is a funny saying with a painful truism. During years of construction, I’ve met many carpenters who lacked personal pride in their work, and who would spout this off with regularity. The simple truth is it doesn’t take any longer to do the job right, and the feeling of pride in a job well done is always worth the practice. Rather than hacking a model together and relying on the covering to conceal it, I would rather build clean and strong airframes from the start.

If you’ve been following

along with this column, we’ve been discussing how to get started in building scale model airplanes. The previous columns have discussed which glues to use and how to select balsa wood properly for your project as well as a “how-to” on balsa strip planking. Today we will look at some of the tools that are mandatory in starting to build airplanes as well as exploring good building practices.

Building By Hand

Model airplanes are hand-built using a vast variety of hand tools. Knowing which ones you

need and which ones to use for different tasks is the key to good results. The tool which you will undoubtedly use the most is the trusty hobby knife. There are many brands of hobby knives, with the X-ACTO® blade being the most well known. A straight X-ACTO® #11 handle, with a #11 carbon steel blade installed will handle many cutting jobs with precision and quality. I mainly use mine for cutting out curved parts, sheeting, strips of wood (1/16-in. and less), holes, and intricate parts. In addition, it is the blade of choice for making strips of wood and for trimming

“ I have found the X-Life™, blue tinted blades from X-ACTO® to be among the longest lasting ”



The razor saw is a thin, finely toothed saw blade that is attached to a handle and is used for straight, cross-cutting of larger and denser wood pieces.

covering. Just like a shaving razor, your knife blades are going to need to be changed regularly to keep your cuts clean, so plan on having some extras on hand as it is common to go through a half-dozen blades on a single project. I have found the X-Life™, blue tinted blades from X-ACTO® to be among the longest lasting and sharpest ones available, and I order them online in boxes of one-hundred at a time. One of the downsides of these carbon steel blades, which coincidentally make them great, is that they are extremely sharp and come to a very fine point. *Tip: Always tie and trim a small zip tie to a new blade shaft so that it cannot roll off your workbench and cause an injury. Never pry with the tip since the hardened blades*

are brittle, snap easily, and will become a flying shop projectile. As versatile as the #11 blade is, it cannot do everything well and that’s where the single edged razor blade shines. The single edged razor blade is a versatile companion to the hobby knife. Its flat blade is best used for cutting sticks of balsa wood squarely and to length, as when building “stick and tissue” models. When we refer to “stick and tissue” construction, we are talking about building models using sticks of wood to assemble an open, truss-type framework

that is ultimately covered with a lightweight tissue or cloth. The straight razor blade is the perfect chopper for all of the stick pieces, since it is easily held perpendicular to the building surface and easily aligned with the angles of the miter cuts. You’ll again want to buy these in boxes of 100 at a time at your local hardware store, since you’ll go through them in your shop as you regularly change out dull ones.

Let me interject here that as you change out blades, a new problem surfaces: What do I do with all of the old ones? I don’t recommend tossing them in the trash can for a variety of safety reasons. You could wrap them in protective tape and throw them away, but this is both another chance to cut yourself as well as a hassle. Instead, make yourself up a “hobby sharps” container for your workbench. The perfect container source is found by treating yourself to either a blended Starbucks™ coffee with whipped cream, or a Slurpee™ from the mini-mart. In both cases what you want is the domed top with the 1” straw hole. Permanently attach the top with some plastic glue and use a permanent marker to label it “Old Blades.” Then you’ll have something that can sit on your workbench for years, is naturally tip resistant, and won’t spill blades if knocked onto its side.

The best way to use a single-edged blade to accurately cut sticks to length is to practice



Two versions of hobby knives, both with sharp #11 XACTO® blades installed. The blue “soft grip” version has a hex nut on the end which prevents table roll-off, while the aluminum handled version has a zip-tie attached for safety.

COLUMN

cutting perfect 90 degree angles on scrap wood. Once you have the perpendicular chopping motion down, start at the perimeter of your model and cut and pin down the outer pieces. Place a stick of wood that is slightly longer than necessary on top and across the outer pieces, and mark the wood to length. The trick to the proper cut is to locate your eye exactly above the cut line and sight down the inside edge of the piece beneath. Once the blade is perpendicular and aligned with the edge, press it lightly into the wood, marking the location of the cut, and continue holding

the piece while you repeat the process on the other end. Remove it and finish both cuts on a solid cutting surface. One thing you'll notice right off is that the thicker the sticks, the harder it is to cut the wood perfectly plumb. Also, as the sticks become larger and the density increases, the amount of pressure needed to cut them multiplies. When the necessary force becomes too great, it's time to switch to a razor saw.

The razor saw is a thin, finely toothed saw blade that is attached to a handle. Its main use is for straight, cross-cutting of larger and/or

“ A thinner blade slices through the wood with more accuracy, less effort and waste, ”



Two excellent measuring and marking tools- a six inch steel rule and a steel angle protractor made by General Tools.

When cutting curving pieces of wood and roughing out blocks, such as nose blocks, a coping saw is the best hand tool for the job. It's a versatile tool for cutting larger balsa and hardwood blocks.



denser wood pieces. The one inch tall by five inch long, reinforced blade cuts on the pull-stroke, making it possible for the blade to be thinner than standard handsaw blades. A thinner blade slices through the wood with more accuracy, less effort and waste, making it ideal for intricate hobby work. I reach for my razor saw when the balsa pieces are 1/4-in. square, on up, as well as hardwood sticks larger than 1/8 in. For sheets thicker than 1/8 in. and up to 4-in. width, I use the razor saw with a T-square to cut them to length. When cutting sticks, I align the edge of the blade to the mark using the tip of my index fingernail as a guide. Since the teeth are set flush to the edges, meaning they don't poke out the sides, it's safe to flush cut against the edge. The flat edge of the wide blade guides the cut along the cut path, helping to ensure straight cuts. *Tip: Be sure to use a scrap piece of wood as a cutting board since you will leave a gouged surface when you've finished sawing through the piece.* This type of saw, when treated well, will typically last many projects and only occasionally need replacement.

For cutting along curved lines



On thicker sheets of balsa, start with a razor saw against the edge, being careful to not hit the metal protractor head, and pull the blade away from the piece to mark the line.



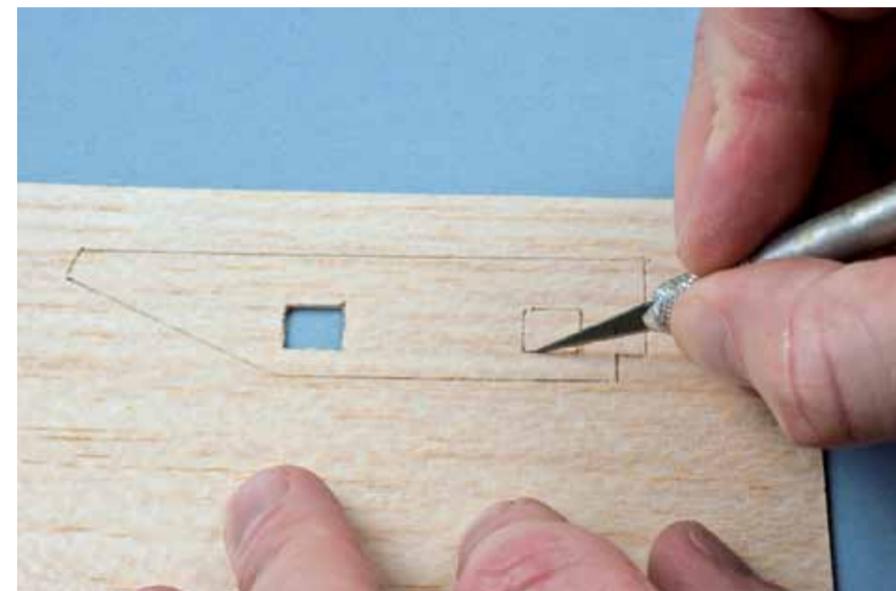
Remove the protractor after marking the cut, and then cut through the plank while ensuring the blade is kept plumb.

and roughing out blocks, such as nose blocks, a coping saw is the best hand tool for the job. The coping saw blade is narrow and the teeth have a bit of set to them, making it a versatile tool for cutting both balsa and hardwoods. The handle of the coping saw controls the tension and changing of the blade, and the blade ends can be rotated to permit the throat of the saw to clear the edges during scroll cutting. One of the secrets to using the coping saw properly is to orient the teeth of the blade so that it cuts on the down stroke. Because the down-force of the stroke presses the work against the supporting surface, the process of holding the piece still and following the cut line is made easier. Select a fine-toothed blade for most hobby use, with a high TPI (teeth per inch) count. Sixteen TPI is a course blade for rough blank cutting, while 24 TPI will give much finer cut and slice through hard materials nicely. Note that when using both the razor saw and the coping saw, a standard back and forth sawing motion is

appropriate, even though they cut on opposite stroke directions. The direction of cut is important to know, however, so you can ease the blade into the work to establish the rest of the cut. Being able to cut wood cleanly and squarely is best done by using a 6-in. stainless steel protractor purchased at a local hardware store. I have one made by General Tools Manufacturing, Inc., and it features a knurled thumbscrew to set perfect 90° angles for common sheet cutting. The ability to set and transfer a plan angle, to a part to be cut, is very useful in modeling. This \$20

tool will stay on your workbench through constant use and help you make accurate cross-cuts. On thicker sheets of balsa, gently ease the razor saw into the wood while against the edge, being careful to not hit the metal protractor head. Then remove the steel straightedge and finish the cut. For quick cutting of thinner sheets of balsa, I place the protractor head at the far side of the piece, and pull a hobby knife blade toward me along the edge. This tool will definitely keep you on the straight and true.

All of these tools get very frequent use in my shop and



Remove the protractor after marking the cut, and then cut through the plank while ensuring the blade is kept plumb.



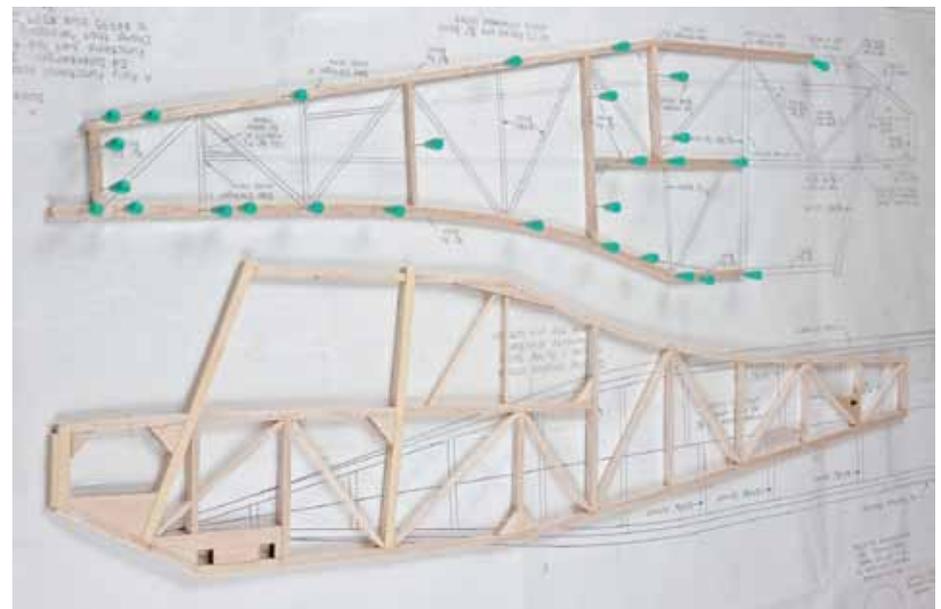
Thin sheets of wood can be crosscut with a straightedge and hobby knife with good results.

A perfect way to store old blades is outlined in the text, and is also a great excuse to get a blended, whipped-cream-topped beverage!

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should be considered staple tools for any model builder. If you don't already own them, go get them at your local hobby shop and hardware store. As we continue this series of exploring scale building, I'll show you some of the power tools that are more optional to own, but very enjoyable if your budget can stretch to accommodate them.

Currently on the workbench is an Aeronca Champ kit that I have begun the fuselage framing upon. Stay tuned for more details!

Now, with building season firmly underway, I just started on an Aeronca 7AC Champ designed by Sky Greenawalt of Acme Aircraft. It's a 60-in. wingspan, electric-powered, stick-built balsa, scale kit that should finish at around 38 ounces, which results in an 11 to 12 ounces per square foot wing loading. I'm still in the



Scale Scene

Source Guide

X-ACTO® X-Life™ bulk packs (100) #11 blades

Stock # X611
Elmer's Products, Inc.
1 Easton Oval
Columbus, Ohio 43219

Web site: xactoproducts.com/p_cuttingtools_blades.asp

Aeronca 7AC Champ Kit by Acme Aircraft

Distributed by:
TFC Aeroplanes
9461 Deschutes Rd Ste 10
Palo Cedro, CA 96073
(530) 547-1703
Web site: Fly2Build.com

framing stage at this point but things are moving along well and it will be taking shape soon. Send me your comments, thoughts and questions about the column

to the magazine editor and he'll send them on to me. I am looking forward to hearing from you and what's happening on your own scale scene.