SCARFING . . . ONE MORE TIME

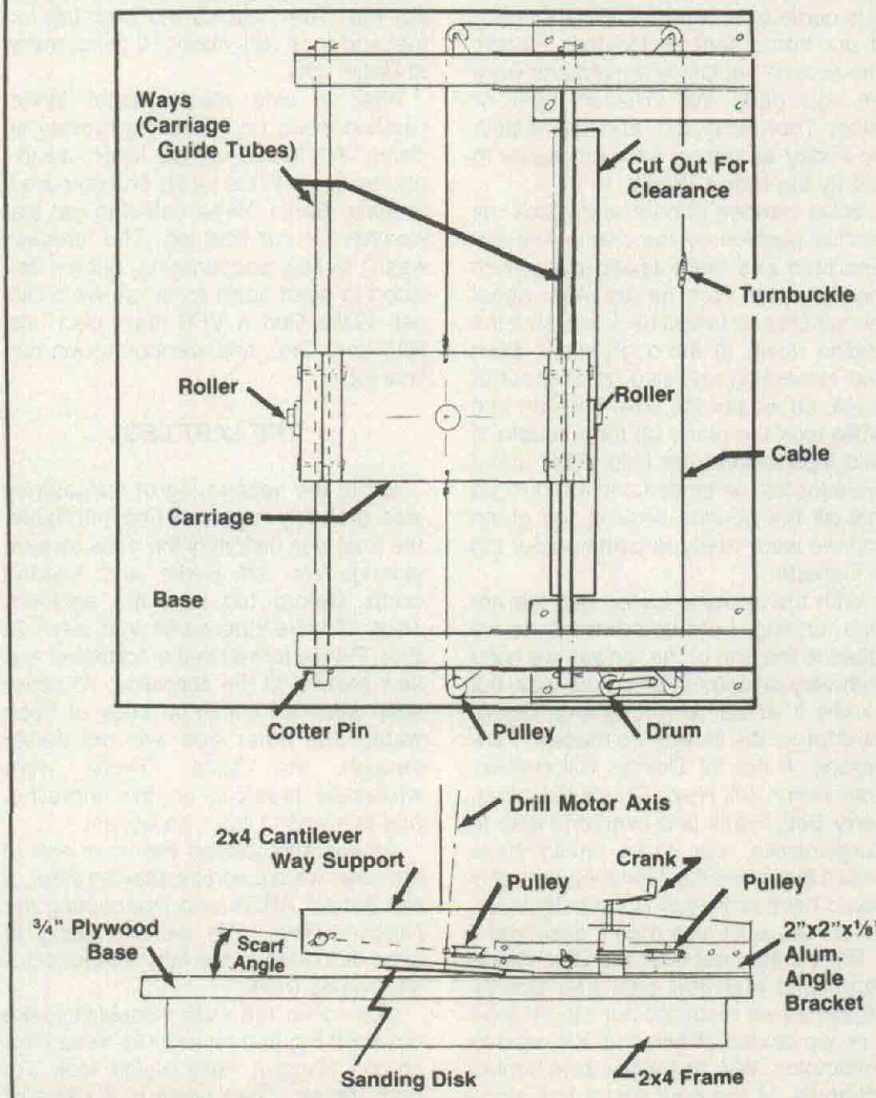
OR

How I Conquered The Scarfing Monster

by **Marty Maisel (EAA 114299)**
6552 Purple Vale Ct.
San Jose, CA 95119

There are probably as many ways to scarf a piece of plywood as there are ways to skin a cat . . . although, frankly, I've only tried my hand at scarfing. What I did find out is no surprise - the method or tooling used directly determines the character and quality of the finished product. My goal was to obtain a planar (i.e. a constant bevel angle and linear surface) cut for any desired length with plywood thicknesses ranging from about 1/16" (1.5mm) to 3/16" (5mm). I also wanted a 16-to-1 scarf ratio (recognizing that a 12-to-1 ratio is acceptable) which results in a feather edge that cannot be reliably produced by many methods. Dimensional control and precision were mandatory.

After my usual trial and error process I settled on the tool shown in Figure 1. The cutting is done with a 6" sanding disk on a hard backplate driven by a drill motor mounted on a moveable carriage. A Portalign drill guide fixture is used to mount the drill motor to the carriage plate. Two "ways" (carriage guides) made of polished thin-wall metal electrical conduit tubing (approximately 11/16" O.D.), set in cantilevered end supports, fix the carriage and sanding disk angle. The lower edge of the sanding disk is positioned to just touch the surface of the 3/4" thick plywood base. A drum/crank/cable/pulley system is used to move the carriage back-and-forth along the ways and over the workpiece. The cable is arranged to pull the carriage along a line parallel to the ways that passes through the axis of



SCARFING TOOL SKETCH

Marty Maisel
Oct. '88

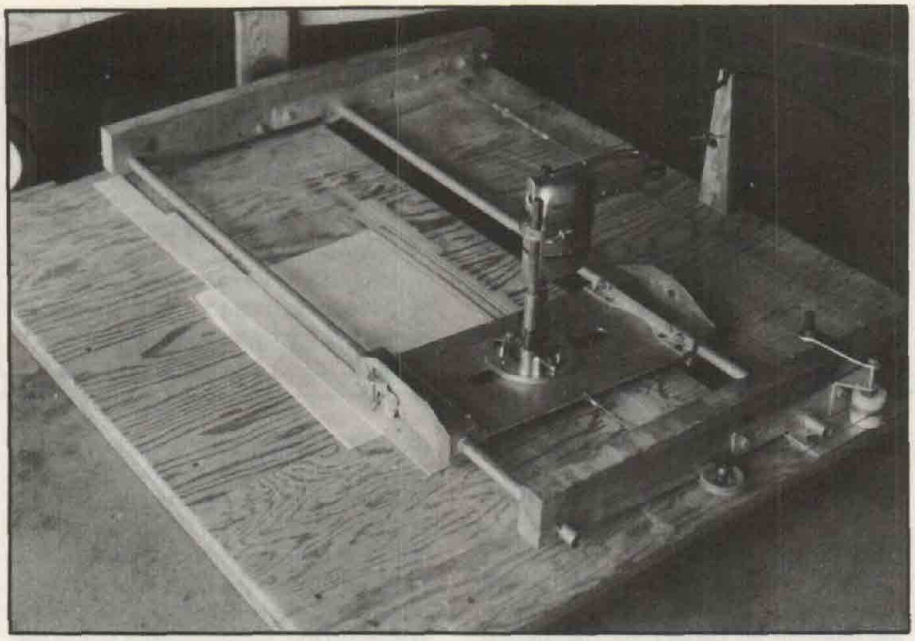


Figure 1

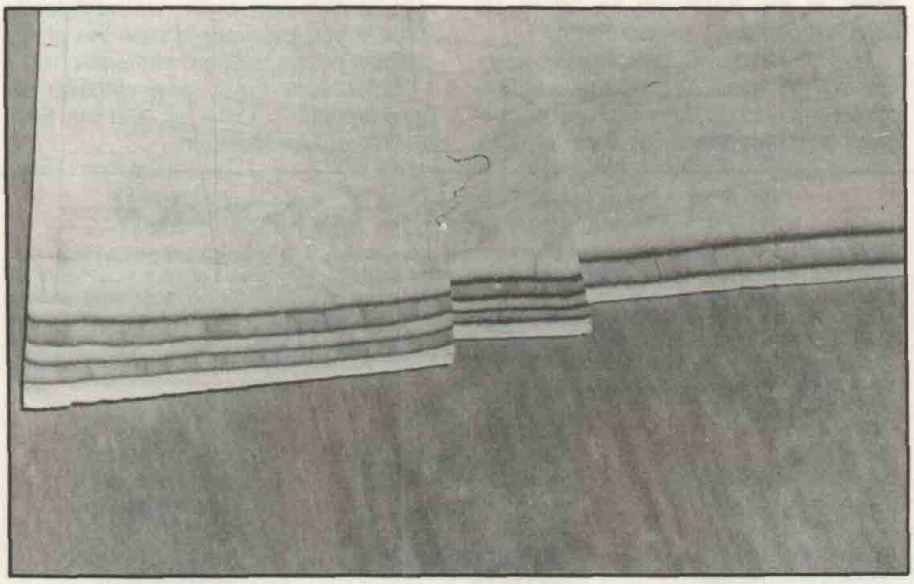


Figure 2

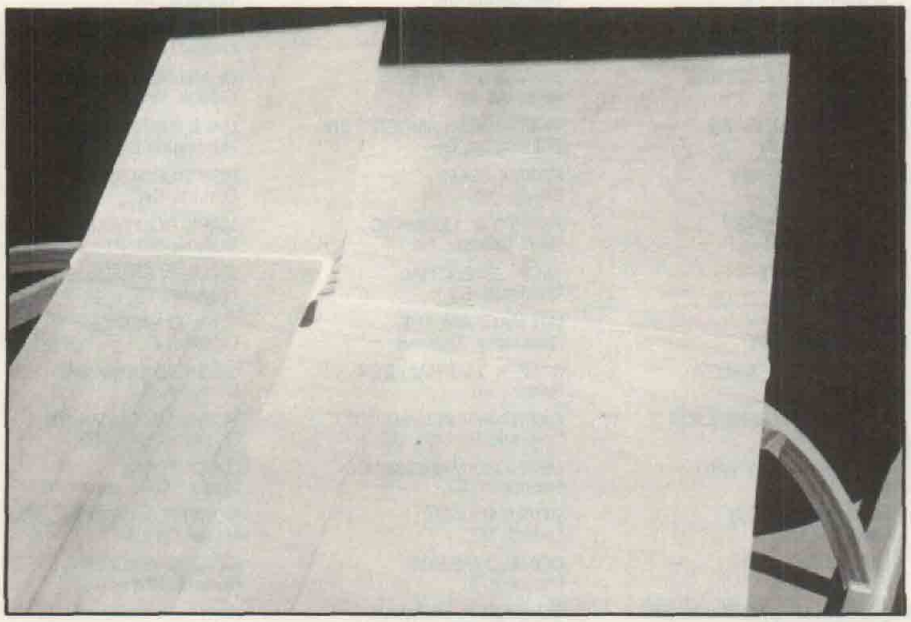


Figure 3

the sanding disk. Turnbuckles are used for cable tension adjustment. To eliminate the deflection (sagging) of the ways midway between the end supports, and its effect on the scarf cut, rollers are affixed to both ends of the carriage. The roller that will pass over the plywood workpiece is height-adjustable to allow for changes in plywood thickness.

With an 80-grit sanding disk, each back-and-forth pass scarfs a thickness of about 0.5mm. Following each cut the plywood is advanced about 3/8" into the disk and the back-and-forth cycle is repeated. About three cycles are required for 1/16" plywood. Figure 2 shows examples of scarf cuts in 3-ply 1.5mm and 5-ply 2.0mm plywood. The finished joints are shown in Figure 3. My scarfing tool cuts up to a 30" long scarf at a time. For longer lengths, after the initial 30" cut is completed, the uncut plywood is moved into the working range and the process is repeated. I have produced quality scarfs about 6 ft. long in 1.5mm plywood with relative ease. The hard part was deciding to take the time to make the tool.

Not only is the work associated with the scarfing reduced with this tool, but the structural quality and appearance of the finished product is improved because of the dimensional control of the cut. Was the decision to build the scarfing tool a good one? I'm sure most wood-aircraft builders would agree - you bet it was!

Readers are invited to submit entries to EAA, Hints For Homebuilders, Att: Golda Cox, Wittman Airfield, Oshkosh, WI 54903-3086. Entries will be reviewed by a panel of EAA judges. Readers whose hints are published in any EAA magazine will be awarded one of three monthly prizes - a 3/8 inch Drive Socket Wrench Set, a 1/4 inch Drive Socket Wrench Set or a Nine-piece Long-Handle Combination Wrench Set. The contest will run from August through July of each year with a Grand Prize of a Snap-on Tools KR657 Roll Cab and KR637 Top Chest being awarded the best entry for the year. This award will be presented during the EAA Convention beginning in 1989. Our thanks go to Snap-on Tools for providing the awards.