

## Develop a game plan

MAKE A STEP-BY-STEP PLAN FOR EACH PROJECT TO MAXIMIZE EFFICIENCY AND MINIMIZE MISTAKES

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**M**any woodworkers use drawings and cutlists for each project to help them avoid waste and errors and to keep their work organized. I like to go one step further and develop a complete game plan. This plan is basically a series of steps I follow to mill, shape, assemble, and finish the individual parts and components of a project. It's a disciplined and careful way of thinking in advance about the best way to build a project, using the tools in my shop.

I think about these questions in a specific order, starting with the largest task and working down to the smaller details. If a piece is complex enough, I'll write down the plan on paper. For simpler projects, I keep the sequence in my head. In the process, I almost always find ways to save time by combining steps. I also spare myself some aggravation by making sure that I don't work myself into any corners. As a result, my shop sessions are much more efficient and enjoyable. Here are some tips:



### 1. Find ways to combine milling tasks

When milling, try to avoid the confusion and wasted time that come from repeated machine setups.

A small end table that I built recently, for example, requires  $\frac{3}{4}$ -in.-thick stock in each of three major sub-assemblies. It makes sense to mill all of that stock in one operation—the milling will be more consistent and you will spend less time breaking down and setting up machines.

But don't let the quest for efficiency lead you into other problems. If your stock is not fully acclimated to the shop, or if you know you'll be out of the shop for a couple of weeks between building assemblies, plan to mill up only enough stock to build one assembly at a time.

### 2. Find the right sequence for fashioning parts

Think about all the steps needed to produce each individual piece, and decide on the best tools and most streamlined sequence for carrying out those steps.

A set of tapered table legs, for example, will require both tapering and mortising. In many cases, you'll want to cut the mortises before tapering the legs because it is difficult to hold a tapered leg secure and level in a router jig, on a drill-press table, or on a workbench. On curved parts, too, it's often easier to cut the joinery before the curves.

Some tasks that take place late in a project can be simplified if you take preparatory steps early on. One



### THINK IT THROUGH

My planning process sometimes yields nothing tangible—just a set of mental notes to guide my work. For more complex projects, I'll jot down a few notes or make a full written set of steps to follow in the shop. These notes also make it easy to take a long break from a project and hit the ground running when I return. Here's what such a list might look like for a simple end table with a drawer.

1. Rough-mill all pieces
2. Make legs
  - a. Final-mill leg blanks
  - b. Lay out and cut mortises
  - c. Cut tapers
  - d. Sand legs
3. Make side rails
  - a. Final-mill stock
  - b. Lay out and cut tenons
  - c. Dry-fit side rails to legs
  - d. Sand rails
4. Assemble table base sides (side rails to legs)
  - a. Dry-fit parts; dry run of clamping strategy
  - b. Glue up sides

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simple example is remembering to rabbet the back edges of case components before assembling the case (to allow installation of the back).

When building a cabinet with inset doors, for example, make a note to mortise for the hinges before assembling the case. It's easier to do this work before the case is assembled than it is to mount a router on the edge of a cabinet frame. You can mortise the doors later, after fitting them to the case.

### 3. Decide which components to assemble first, next, and last

It's just easier to fit some assemblies or joints together accurately if you build them in a particular order. You build one part, and then fit the next one to it.

For a small end table, I decided to build the base first so that I could then custom-fit the drawer by transferring dimensions from the opening I had created. In doing so, I spared myself no end of fussing and measuring.



I fit a drawer by transferring dimensions from the opening. In doing so, I spare myself no end of fussing and measuring.

The mortise-and-tenon joinery in the table's base offers another example. One approach would be to cut both portions of the joint to the specified dimensions. But doing this risks wasting a lot of time shimming or trimming tenons to fit. Most teachers will tell you the better way is to cut the mortise first, because the width of the mortise is less variable, as it is determined by the width of the tool used to cut it. Then transfer the dimensions and cut the tenons to fit. For my table, that meant milling up and mortising the legs before I started on the aprons.

Wood movement is another area to consider, particularly if your project will sit idle for long stretches between shop sessions. On my end table, I saved gluing up the top for last. If I had done it earlier, it might have warped before I could build the other components.

### 4. Plan for the finish before you begin

At some point early in my planning, I decide what type of finish to apply. First, I preview the appearance of my top candidates on sample boards. I also note any surfaces that should be sanded and finished before assembly.

For example, it's best to finish the panel in a raised-panel door before the door goes together. This will take the hassle out of applying finish at the corners, and it will prevent bare spots from showing at the edges when the panel shrinks.

In casework, it also pays to sand and finish any interior surfaces that need it before gluing up. In this way, you

don't wind up awkwardly trying to sand the inside of a bookcase. Just be sure to keep finish off any surfaces that will be glued.

### 5. Glue up in stages

Think ahead about how much of a particular assembly you can glue up successfully at any one time. It might be possible, for instance, to glue up the entire base of a table or an entire frame-and-panel case at once. But you'll make yourself crazy and use all of your clamps trying. How many clamps do you have? And how many arms? You might end up with the glue dry and the assembly out of whack somehow.

Instead, think about breaking the glue-ups into manageable chunks. And plan to spend some time on a dry run of each glue-up. Nothing beats this technique for identifying trouble spots. □

## THINK IT THROUGH (CONTINUED)

### 5. Make back rail and dividers

- Final-mill stock
- Lay out and cut tenons on back rail and lower divider
- Lay out and cut tail on upper divider
- Sand rail and dividers

### 6. Final table base assembly

- Dry-fit base to lay out legs for upper divider; dry run of clamping strategy
- Mortise legs for upper divider
- Glue up table base

### 7. Install doublers, runners, and kickers

- Final-mill all parts
- Cut to final dimensions
- Test-fit and dry run of clamping strategy
- Glue in doublers, runners, and kickers

### 8. Build drawer

- Final-mill all parts
- Cut to final dimensions

### 9. Build and install top

- Final-mill top pieces and rear cleat
- Dress table pieces for edge gluing
- Dry-fit table pieces; dry run of clamping strategy
- Glue up tabletop
- Cut rear cleat to final dimensions
- Test-fit rear cleat
- Install rear cleat
- Drill holes in rear cleat, kickers, and upper dividers to receive top
- Dry-fit top; mark and drill pilot holes
- Prepare tabletop for finishing
- Finish tabletop
- Install tabletop

### 10. Finish table