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Greene & Greene Inspired Desk

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- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.

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Greene & Greene Inspired Desk

If you've ever dreamed of a signature piece in your home office or den, this handsome mahogany desk could well be it. It has the sort of plug, trim and drawer pull details that make it pleasing to both touch and view. And once you're seated behind it, you'll know you've got a serious desk. Time to round up some prime mahogany and get started!

With a little investigation, we think you'll agree that this Greene and Greene inspired desk is one of those rare woodworking projects: It manages to be an impressive piece on many levels, yet it's very straightforward to build.

For many years now, Mike McGlynn, one of our contributing editors, has been tremendously fond of the Greene brothers' style. He once toured the Gamble house, their California masterpiece, and viewed even more examples of their furniture in both the Los Angeles County museum and the Huntington Museum. Seeing the Greenes', (more accurately their builders, the Hall brothers') work up close inspired Mike and taught him some new tricks. He put this newfound knowledge into the design of this desk.

Stocking Up

With the exception of the many decorative details, this desk's construction is true bread-and-butter woodworking: mortise and tenon joinery, frame and panel construction, pocket hole joints and breadboard ends.

One nice aspect of Greene and Greene furniture is its mahogany construction. In addition to looking nice, it makes wood selection easier, due to the availability of clear, large-dimension boards. To construct this desk, you'll need some 10/4 stock for the legs and 5/4 for all the other solid parts. In addition, you will need a sheet of 3/4" mahogany plywood. You'll also need 1/2" Baltic birch plywood for the drawer boxes and a small amount of ebony for the accent plugs and top splines.

Making the Drawer Pedestals

The first step to building the drawer pedestals is to mill all of their solid-wood parts (pieces 1 through 7) to the dimensions in the *Material List* on page 74.

After you have your parts dimensioned, but before you taper the feet and profile the bottom rails, cut all the joints and panel grooves. There are essentially two types of joints in these drawer pedestals: mortise and tenon and pocket screw. Mike uses pocket screws in certain areas because he feels they are strong, efficient options.

He cuts his mortises and tenons on a Multi-Router, but as all of the mortises and tenons are at right angles, they can be readily cut with a variety of methods. Before you start to cut, make sure you match up your legs into groups of four and mark which faces go together; there is nothing worse than completing your mortises and realizing you chopped a set on the outside face of one of your perfectly grain-matched legs.

After matching up your legs completely, lay out the mortises on one front (panel end) leg. (See the *Technical Drawings* for more construction details.) By drawing centerlines through these mortises and transferring just the centerlines to the other legs you will have your mortise index line without having to completely draw out all the mortises.

Once you've cut the leg mortises, lay out and chop the mortises in the top and bottom side rails. These are quite

Mike chops his mortises with a Multi-router. This project's mortises are all conventional straight mortises that can be formed just as easily in the traditional manner.

Tenons on the panel dividers are shorter than those on the bottom rails. Test-fit the tenons in their mortises as you make them.

Install a mortising attachment on your drill press to create the square mortise for the legs' decorative ebony plugs.

shallow mortises and are used more for positioning than for strength.

When you have finished all the mortises, lay out the tenons and cut them with your preferred method. To make this project simpler, something Mike is always in favor of, all the mortises and tenons are the same size (with the exception of the side panel stiles).

Cutting the Panel Grooves

Once your mortises and tenons are cut, get ready to cut the panel retaining grooves in all the appropriate legs, rails and stiles.

You could use solid-wood panels in this desk, but Mike opted to use 1/4" plywood for its lightness and for its book-matched figure. If possible, go to a yard where they will allow you to look through the plywood. Carefully examine the veneer seams and choose sheets from which you'll be able to cut balanced-looking panels. When you get the plywood to your shop, you'll notice the 1/4" plywood is more like 7/32" or 3/16" thick. It's for this reason you don't want to plow the panel grooves before you have your plywood in hand. Mike cuts his grooves on a router table with a fence. You might have to take two passes with a smaller bit to make a properly sized groove, which should be a nice slip fit—not too tight or too loose. (NOTE: set aside the top and bottom rails on the drawer side: these don't need grooves.) Start by grooving the central panel stile, then the top and bottom rails, and finally the legs. This way, you can slip the piece into its mortise and match up the groove in the receiving piece perfectly. Now is the time to cut your plywood panels (pieces 8 and 9) to size, testing their fit as you go.

Before proceeding to the detailing, cut the square mortises for the ebony plugs. As before, do a complete layout on one leg and then use centerlines on all the others. Cut these mortises 3/16" deep with a square mortising chisel set-up on your drill press.

Greene and Greene Details

Special design details create this desk's Greene and Greene style. Creating them requires several steps: tapering the bottoms of the legs, cutting the "cloud lifts" in the rails, and rounding over all the appropriate edges. Taper the legs on a simple table saw tapering jig and clean them up with a block plane and sandpaper. The "cloud lifts" are best made by template-shaping on a router table. Mike usually makes a template from 1/4" material, draws the pattern on the desk component, cut it out to within 1/16", then tapes the template to the part and shapes it with a 1/2" bearing-guided pattern bit in a router table. After routing, square up the inside corners with a sharp chisel.

You also need to ease the outside corner of the cloud lift to a slight curve. The last step before the roundovers is to cut pocket holes in the top rails and the drawer dividers.

To do you roundovers, use a trim router if you have one with a 1/8" roundover bit. You will be rounding over the appropriate edges of the legs (see the *Technical Drawings*), the bottom rails, the top rails, the panel stile and the drawer dividers. Be very careful not to round over the ends of any part other than the leg bottoms.

To prepare for staining, sand all pieces, including the panels, to 120 grit. Raise the grain with a damp cloth and then sand to 220. Mike prefers to stain the pieces apart because it results in a more even stain job and less time in purgatory for swearing. The stain he uses for Greene and Green mahogany pieces is a water-based aniline dye. It is easily applied, colorfast and doesn't muddy the surface. It's best to experiment a bit and get your technique down before staining the actual desk parts.

After the stained pieces are dry, there is one final step before assembly: buff all the surfaces with a fine Scotchbrite® pad. It smoothes out any raised grain and will provide you with a much better finish. Be sure to wear rubber gloves when handling the stained parts so that skin moisture doesn't lift or mark the water-soluble dye.

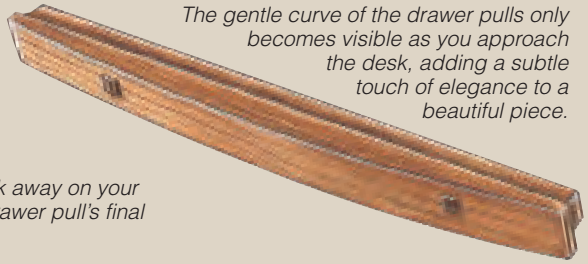
Assembling the Pedestals

The first stage of assembly is to assemble the side subassemblies. In the interest of longevity, Mike uses West

ELEGANT HANDLE DESIGN… A CLASSIC GREENE AND GREENE DETAIL

While visiting the Huntington Museum, Mike was powerfully impressed with the level of detail the Greenes included in their furniture pieces. These drawer handles were inspired by observing furniture at the museum. To make the handles, first cut the blanks to size and then create a template to form the handle's subtle curve. Find the template's shape on the *Technical Drawings*. After you have shaped the curve and relieved the finger-grip cove, step to the table saw and trim the handle's base to match the depth of the cove cut. This creates a base that flows gently into the front aspect of the handle.

Trim the remaining stock away on your table saw to form the drawer pull's final footprint.



The gentle curve of the drawer pulls only becomes visible as you approach the desk, adding a subtle touch of elegance to a beautiful piece.

Template routing a subtle curve is the first step in making the desk's drawer handles. Use double-sided tape to attach the template—and keep your fingers clear.

With the base to the fence, use a cove bit to relieve a finger grip on the handle. Then step to the table saw to trim the base's footprint.

Substance and style create the Greene and Greene look. The final step in making the handle is boring mortises for the ebony plug accents.

System Epoxy for his furniture as it is bombproof and has a long set-up time. Before starting your assembly, gather everything you'll need and be sure the tenon ends and panel edges are slightly eased to aid assembly. Attach the bottom rail to the legs, then the panel stile to the bottom rail, slip the panels into place—in their correct orientation. Clamp everything together and drive home the top rail pocket screws. Although it probably isn't necessary, Mike also adds a screw through the top rail into the end of the panel stile tenon.

Once you have the four side subassemblies done, join them to each other with the top and bottom rails and allow the epoxy to cure. The installation of the drawer dividers is accomplished with the use of two spacer blocks that match the size of the drawer opening. Being that the pocket holes are on the bottom side of the dividers, turn the units upside down and put the top divider in first, resting the spacers on the underside of the top rail. Install the remaining dividers in turn.

The last step in the pedestal assembly is installing the drawer slide supports (pieces 10). They're made of 3/4" ply and are screwed in place onto spacers (pieces 11). To ease drawer slide installation, glue small support tabs (pieces 12) to the bottom edge of the slide supports, prior to installing these pieces. When you install the slide supports, use a large combination square to make sure the top face of this tab is in-line and square to the top edge of the drawer dividers.

Making the Drawers

Now you need to build the drawers, drawer faces and drawer pulls (pieces 13 through 24). Since Mike

is more interested in utility than purism, he builds his drawers out of 1/2" Baltic birch plywood with rabbeted corners, with a 1/4" mahogany veneered MDF core bottom, nailed directly to the bottom of the drawer box. Purists will cringe at this bottom attachment method, but Mike challenges any "bottom in a groove" to a strength and longevity test. If you plan to use hanging files in the file drawers, add 1/8" x 1" aluminum rails (see the *Technical Drawings*).

The drawer faces are made of carefully selected 1"-thick solid wood. For appearance's sake, it is best to get all the drawer fronts—including the pencil drawer—out of one 11"-plus wide board of slightly ribbon striped material. With pieces as wide as the file drawer fronts, be sure to allow them to adjust to equilibrium before their final milling. The pencil drawer front with its cloud lift is machined in the same manner as the bottom rails.

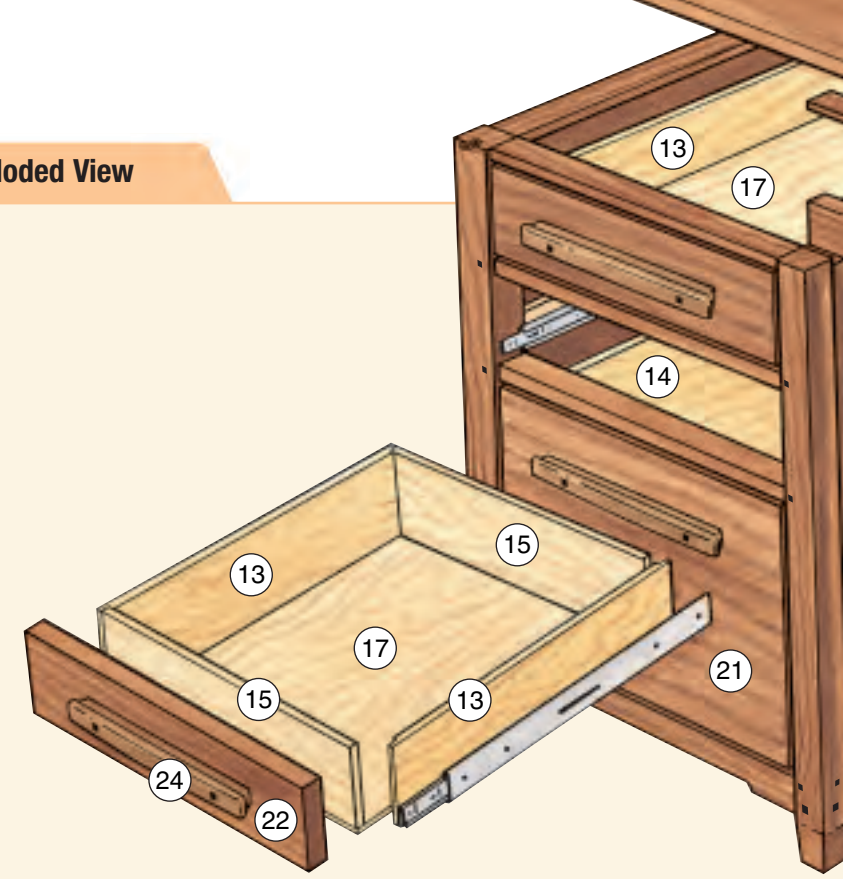
Making the Drawer Pulls

The drawer pulls on this desk were a direct inspiration from some Greene and Greene pieces Mike viewed at the Huntington Museum. Only up close do you notice the subtle curves of these pulls, but it really adds a delightful touch. See the *sidebar* on the preceding page for instructions on how to build these pulls. One important thing to note is that you should put in plenty of time sanding these to make sure they are smooth, fair and nicely tactile. Stain the pulls and fronts in the same manner as the cabinet.

For Modesty's Sake...

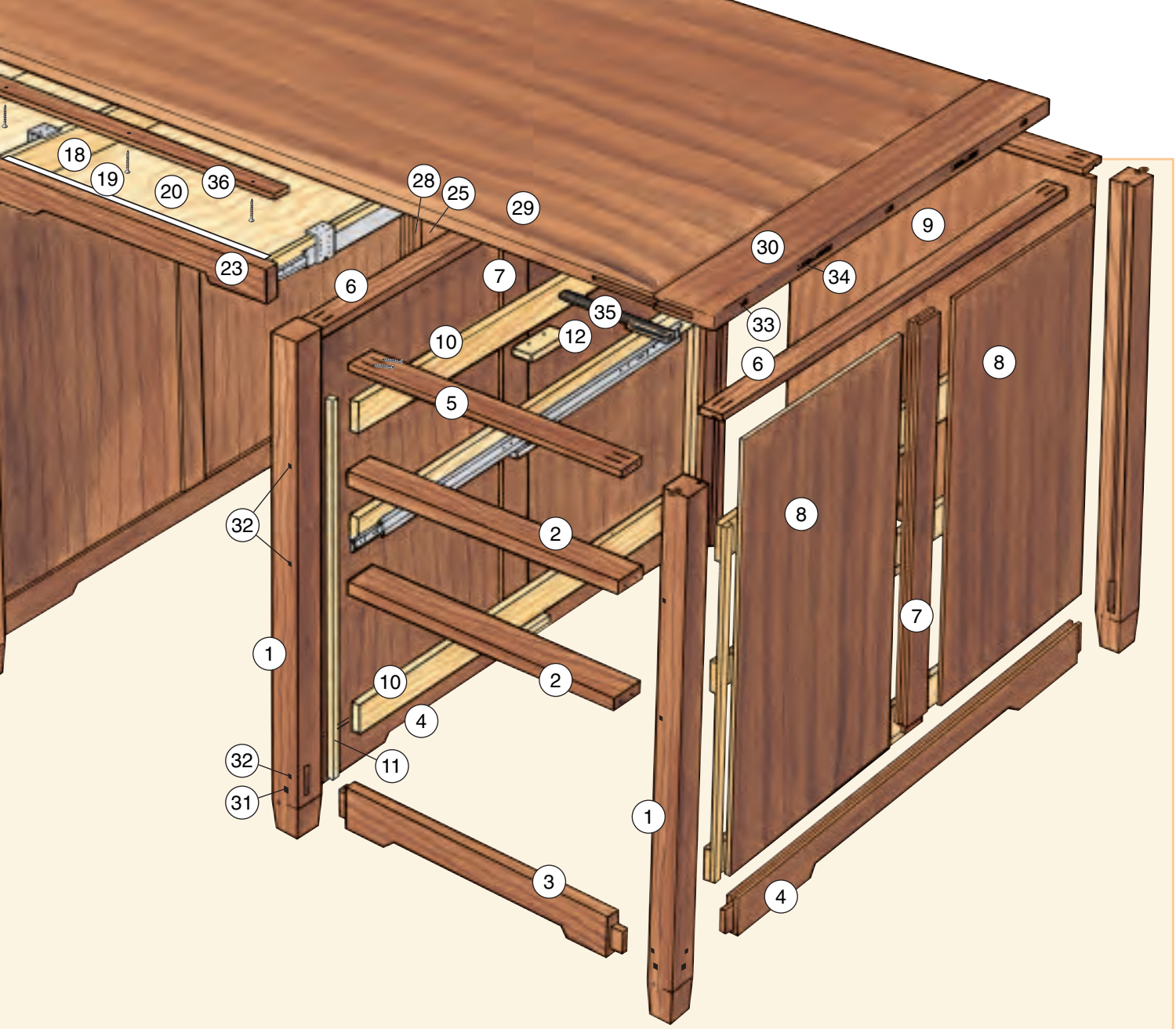
The next subassembly to tackle is the modesty panel. This is quite simple, as it consists of only five parts. Mike used 3/4" plywood for the center panel

Desk Exploded View



MATERIAL LIST – *Carcass & Drawers*

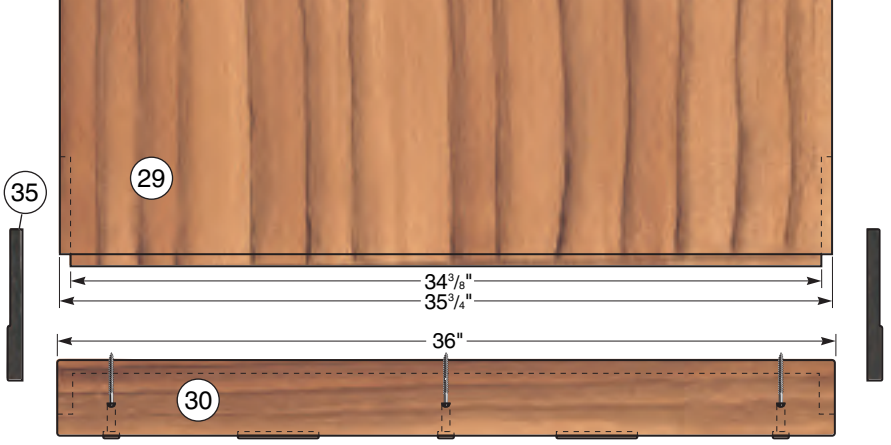
		T x W x L
1	Legs (8)	2" x 2" x 28"
2	Drawer Dividers (4)	1" x 1 7/8" x 14 5/16"
3	Short Bottom Rails (4)	1" x 2" x 16 5/16"
4	Long Bottom Rails (4)	1" x 2" x 31"
5	Short Top Rails (4)	1/2" x 1 7/8" x 14 5/16"
6	Long Top Rails (4)	1/2" x 1 7/8" x 29"
7	Panel Stiles (4)	3/4" x 1 1/2" x 23 7/8"
8	Pedestal Side Panels (8)	1/4" x 14 1/8" x 23 5/8"
9	Pedestal End Panels (2)	1/4" x 14 3/4" x 23 5/8"
10	Drawer Slide Supports (12)	3/4" x 3" x 29"
11	Drawer Slide Spacers (8)	3/4" x 1/2" x 20"
12	Drawer Support Tabs (12)	3/4" x 1 1/2" x 5"
13	Small Drawer Sides (8)	1/2" x 4 5/8" x 22"
14	Large Drawer Sides (4)	1/2" x 9 1/8" x 22"
15	Small Drawer Fronts & Backs (8)	1/2" x 4 5/8" x 12 9/16"
16	Large Drawer Fronts & Backs (4)	1/2" x 4 5/8" x 12 9/16"
17	Drawer Bottoms (6)	1/4" x 13 5/16" x 22"
18	Pencil Drawer Sides (2)	1/2" x 1 3/8" x 22"
19	Pencil Drawer Front & Back (2)	1/2" x 1 3/8" x 28 1/4"
20	Pencil Drawer Bottom (1)	1/4" x 22" x 29"



MATERIAL LIST – *Drawers, Modesty Panel & Details*

		T x W x L
21	Large Drawer Faces (2)	1" x 10 3/8" x 14 3/16"
22	Small Drawer Faces (4)	1" x 5 1/4" x 14 3/16"
23	Pencil Drawer Face (1)	1" x 2 1/4" x 31 1/4"
24	Drawer Pulls (6)	1" x 1" x 10"
25	Modesty Panel (1)	3/4" x 23 1/4" x 30 7/8"
26	Modesty Panel Lower Rail (1)	1 1/4" x 2" x 31 3/8"
27	Modesty Panel Upper Rail (1)	1/2" x 1 7/8" x 31 3/8"
28	Modesty Panel End Stiles (2)	1/2" x 1 3/4" x 23 1/4"

		T x W x L
29	Top (1)	15/16" x 35 3/4" x 64"
30	Breadboard Endcaps (2)	1" x 3 1/2" x 36"
31	Leg and Drawer Ebony Plugs (22)	3/8" x 3/8" x 9/32"
32	Small Ebony Plugs (18)	1/4" x 1/4" x 9/32"
33	Large End Cap Ebony Plugs (6)	3/4" x 3/8" x 9/32"
34	Long End Cap Ebony Plugs (4)	9/32" x 3/8" x 3 3/4"
35	Ebony Splines (4)	3/8" x 11/16" x 7"
36	Pencil Drawer Trim (1)	1/2" x 1 7/8" x 31 3/8"



The end caps are attached with screws but no adhesive. Machine the groove for the top's tongue 1/16" deeper than the tongue itself. The mortises for the ebony spines must allow the splines to float, to accommodate seasonal wood movement.

(piece 25), and while this may seem like an odd choice, he knew 1/4" was too thin and 1/2" is hard to find.

As with the other panels, cut a piece that has a nicely center-balanced veneer pattern. Once you have the panel in hand, mill up your four surround pieces (pieces 26 through 28) with the appropriately sized grooves in them to receive the panel. Using the same method employed in the bottom rails, form the cloud lift in the bottom rail. After drilling the attachment holes in the side and top rails, round over the edges and stain the parts. Then, using glue, nails and screws, assemble the panel.

Topping It Off

Construction of the top is the last major subassembly. Quite frankly, if the other subassemblies were fairly easy, the top (piece 29) looks deceptively simple, but is in fact quite difficult, especially the floating ebony splines. Because the top is the most visible part of the desk, carefully select the wood with the most pleasing grain match possible. Also, make sure the top boards are milled perfectly flat.

Again, Mike uses epoxy to glue up the top. One quick point: an epoxy glue line will not react with the aniline dye as regular glue will. Once the top is glued up, square it up and cut it to size.

Cutting the tongues on the end of the top and their matching spline grooves is the first real opportunity you have to completely screw up the top—one false move and you have a lot of nice mahogany for some smaller project. Mike cut the tongue with a three-wing slot cutter in a hand-held router. Make two to three passes on each side to form the tongue; this will result in a much smoother job. (Clamp a piece of waste stock on each side to prevent blowout.) Now, lay out the spline-mortise (for the ebony spline). Using the same router and bit (reset to the correct depth), rout it and clean up the ends of these slots with a chisel.

The end caps (pieces 30) for the top are also fairly tricky. After milling your parts, plow a groove to match the tongue so the cap and the top are flush on the bottom, but notice that the cap is 1/16" proud of the top (see the *Technical Drawings*). It's important to take this slowly and get a nice slip fit—not too tight, not too loose. Form the groove 1/16" deeper than the tongue to allow for a year-round tight fit. After cutting the groove, mark out the spline slots and chop them out with a chisel. You'll notice this slot is 5/16" deeper than the mortise in the top's edge. This allows the end cap to be 1/8" proud of the top and creates 3/16" of spline-float room, accommodating seasonal expansion and contraction due to humidity.

The rectangular plug mortises (see the *Technical Drawings*) in the cap are cut with a combination of router table and chisels. Under the three 3/8" x 3/4" mortises there are countersunk holes for attachment screws. These holes and their oversized pilot holes should be drilled on a drill press, as they must be very accurate.

At this point, you can do the round over/sand/stain routine for the top and cap. Be very careful of the inboard top cap edge, as it needs only a slight roundover—best done by hand. Once you have the parts stained, you can slip the caps in place and, through the attachment holes, mark the tongue, drill it and screw the caps in place.

Mike used a waterbased aniline dye for this project. He prefers to stain the pieces apart because it results in a more even stain job and less time in purgatory for swearing.

Begin assembling the pedestal's side subassemblies as shown above. Note the top rails' orientation and pocket screw joints.

IT'S ALL IN THE DETAILS

Cloud lift horizontal elements, plugs of contrasting colors and accentuating shapes. Simple lines repeated and amplified… strong Asian influences creating subtle yet striking visual effects. The Greene brothers succeeded in developing a recognizable yet fresh style. Their plugs are especially easy to make; just cut a stick to size, round over the top, buff and trim.

It takes a little longer, but getting done in a hurry wasn't one of the Greene brothers' design goals.

Durable Finish and Ebony Plugs

When you have all your subassemblies stained and ready, it's time for finishing. Mike sprays three to four coats of medium rubbed-effect catalyzed lacquer, but you can achieve just as good a finish by hand with a semigloss varnish and patience.

The final construction step, before assembly, is to make all the ebony plugs and splines (pieces 31 through 35). For the 1/4" x 1/4" plugs and the 3/8" x 3/8" plugs, Mike generally mills up a stick of that dimension, sands and polishes the end to a slight dome, then cuts off the plug to the proper length. He repeats this until he has enough plugs. After easing the inside corners a bit to facilitate insertion, these plugs can be driven home with a touch of silicone caulk on their back sides to hold them if the wood should ever shrink enough to loosen them. The splines are a bit time-consuming because of their shape. Mike cuts them out on a bandsaw and completes them with a combination of files, sandpaper and buffing. You must make sure that they are a slightly loose slip-fit so the cap can expand and contract past them freely. They are glued to the top only. The last ebony parts are the rectangular plugs in the end cap. They are again sawn, sanded and polished to size. The plugs covering the attachment screws are glued in place with silicone adhesive to facilitate possible future removal, and the others are simply glued in place.

Final Assembly

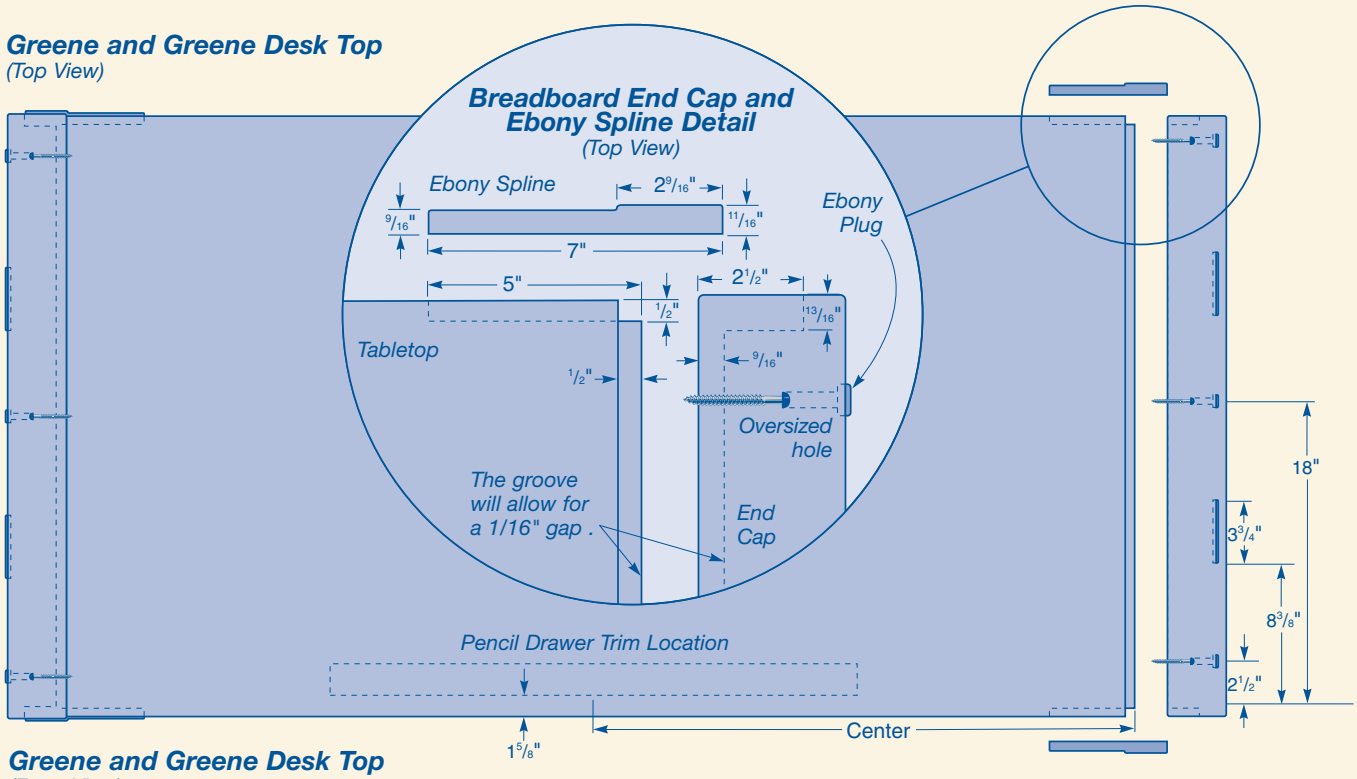
Before starting the assembly, it's best to turn the top upside down, on a padded surface, and lay out the positions of the base pedestals, pencil drawer side mounting and modesty panel. By doing this, you can accurately position the small recesses you have to rout for the tabletop fasteners. While you've got the top turned upside down, attach the trim strip (piece 36) just above the pencil drawer and the pencil drawer slides. It's also a good time to set the modesty panel in place and mark its mounting holes on the underside of the top.

The drawer, drawer front and pull installation is very straightforward, if tedious. For the top drawers, Mike uses K.V. 8500 slides and for the file drawers, K.V. 8505, 22". The pulls are screwed to the drawer faces from inside, and then the faces are attached to the drawer boxes with washer-head screws and oversize holes to allow some positioning for any final adjustments.

With this, your four subassemblies are complete and can be put together. This is done by attaching the top to the drawer pedestals with the tabletop fasteners and then attaching the modesty panel to the top, drilling the side pilot holes, and screwing the modesty panel to the legs. It should be noted that this assembly must take place wherever you want the desk, because it will need to be taken apart to move from one room to another.

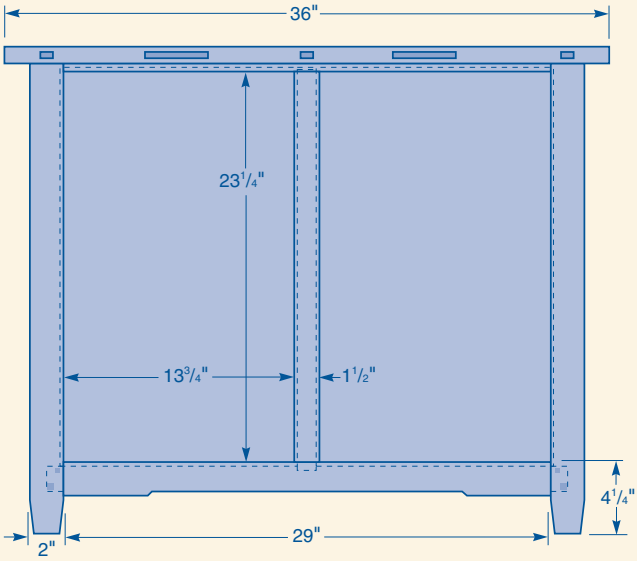
Well, that's it! Now sit back, enjoy your new desk, and dream about your hostile takeover of Microsoft. Well, at least you have the desk for it.

Greene and Greene Desk Top
(Top View)

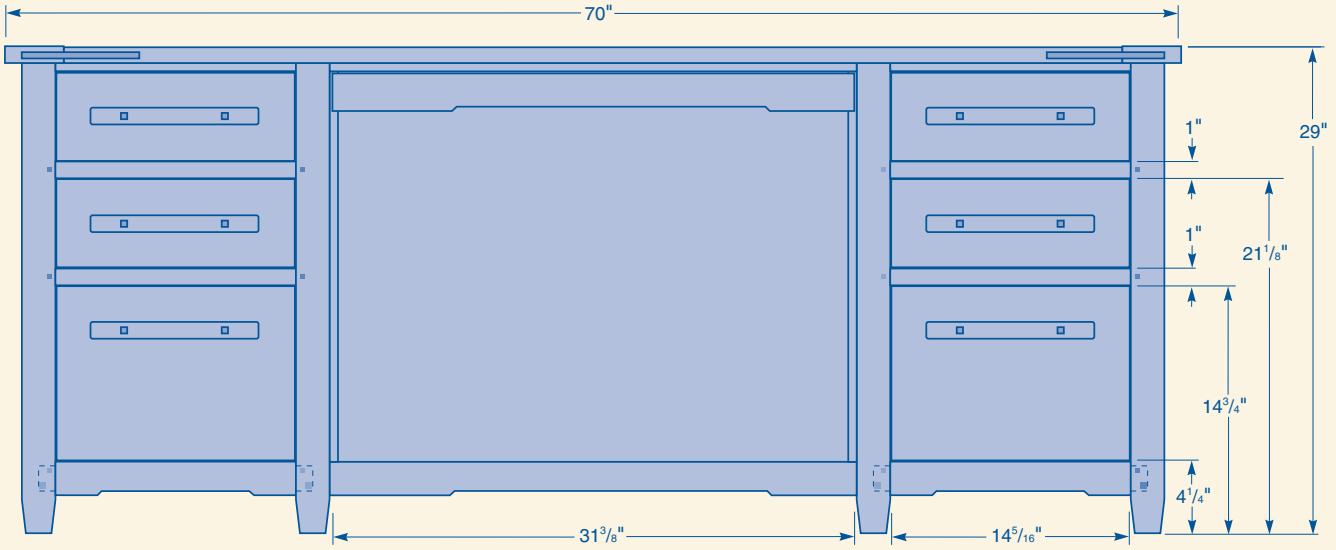


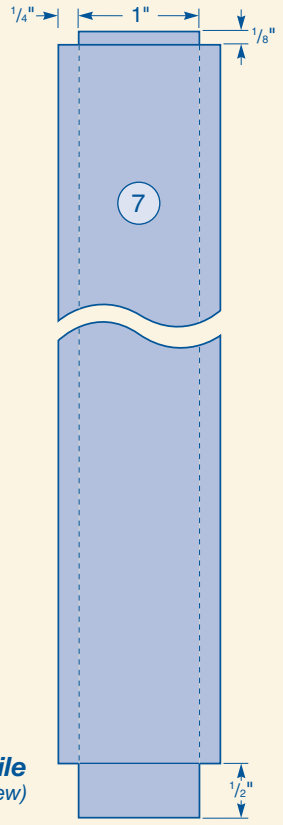
Greene and Greene Desk Top
(Front View)

Greene and Greene Desk
(Side View)

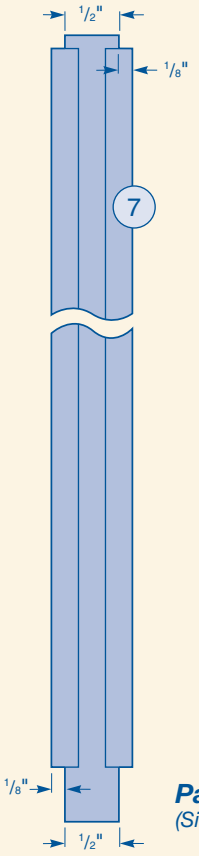


Greene and Greene Desk
(Front View)

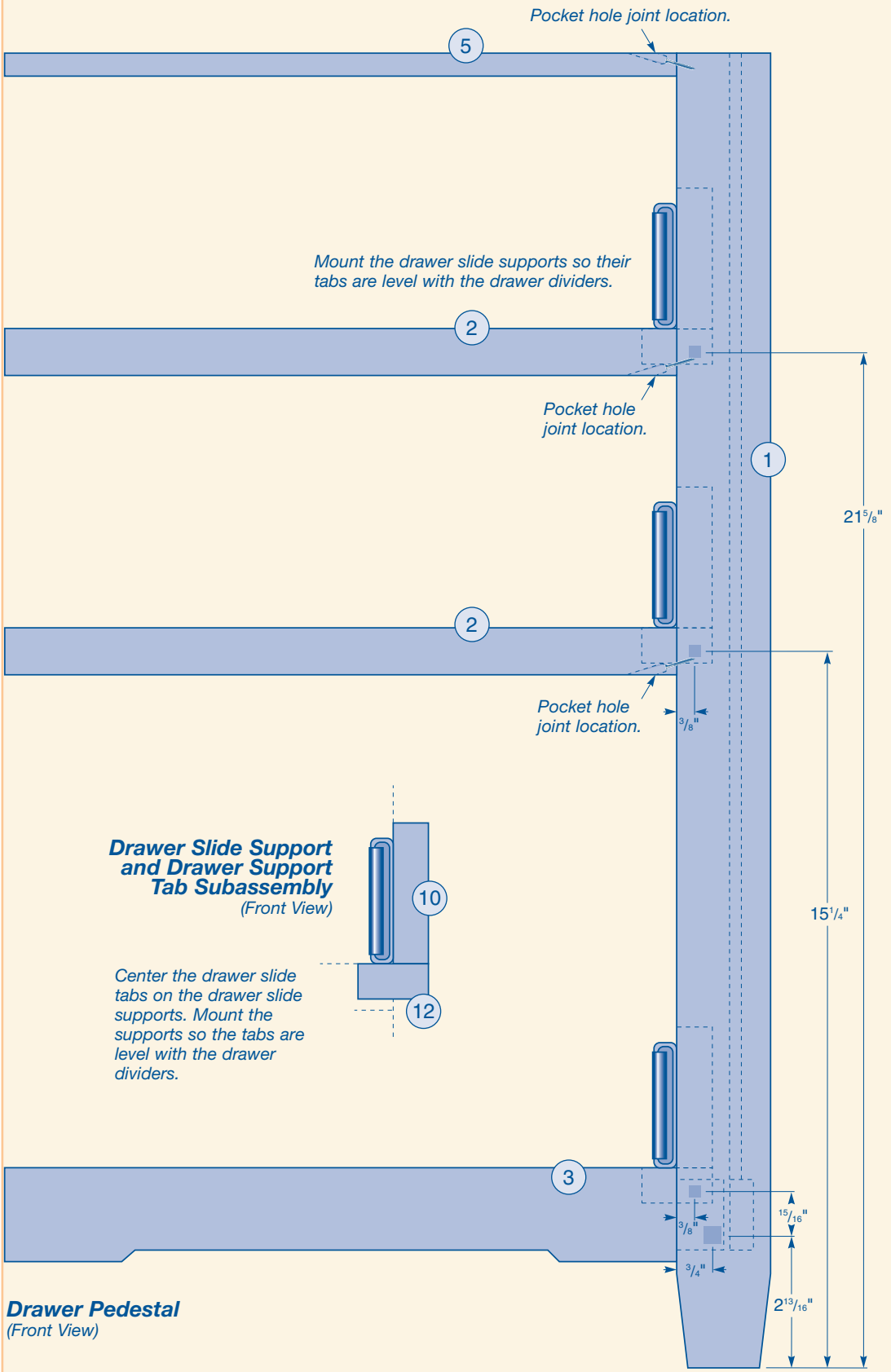




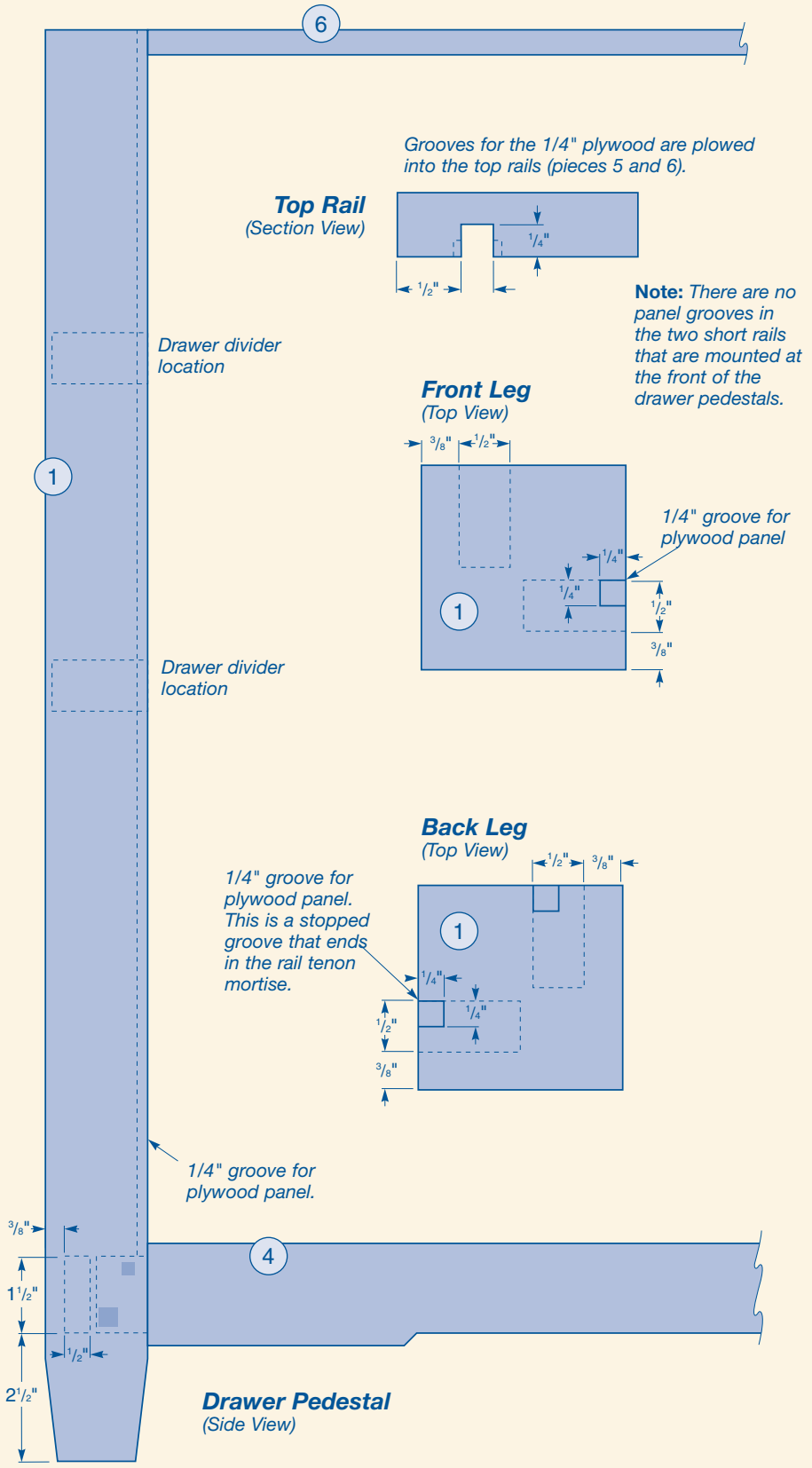
Panel Stile
(Front View)

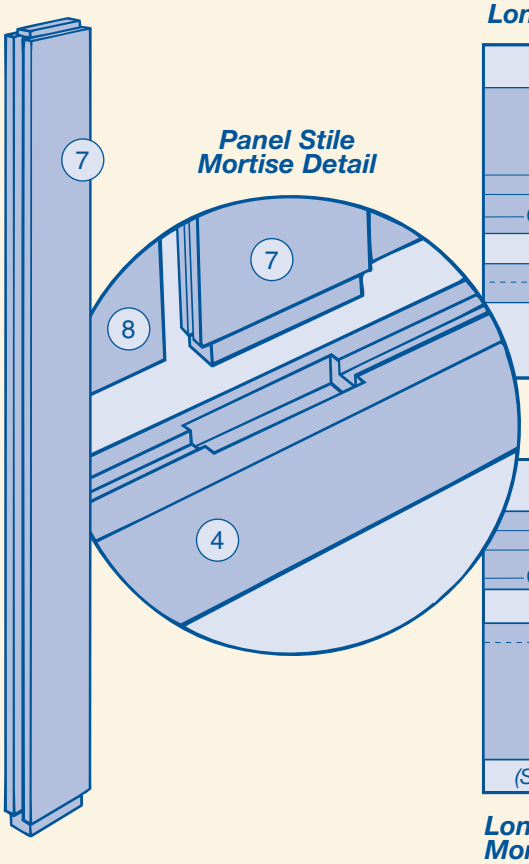


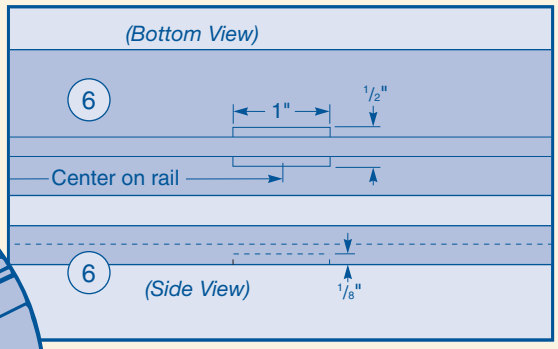
Panel Stile
(Side View)

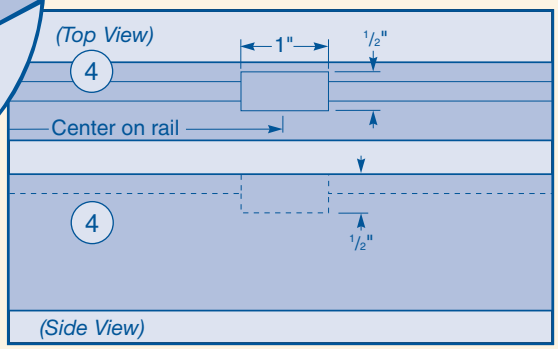


Drawer Pedestal
(Front View)

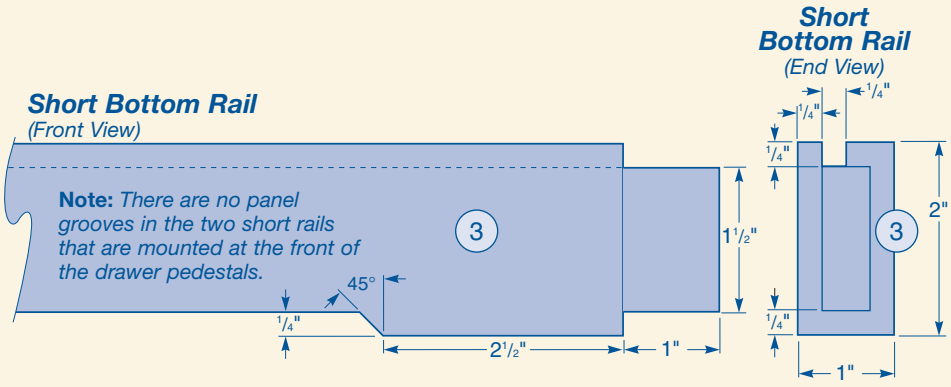




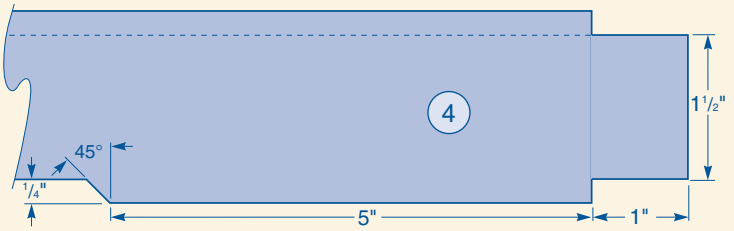


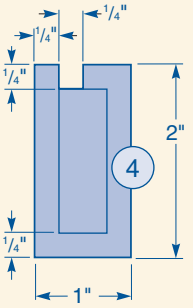


Long Bottom Rail Panel Stile Mortise Location



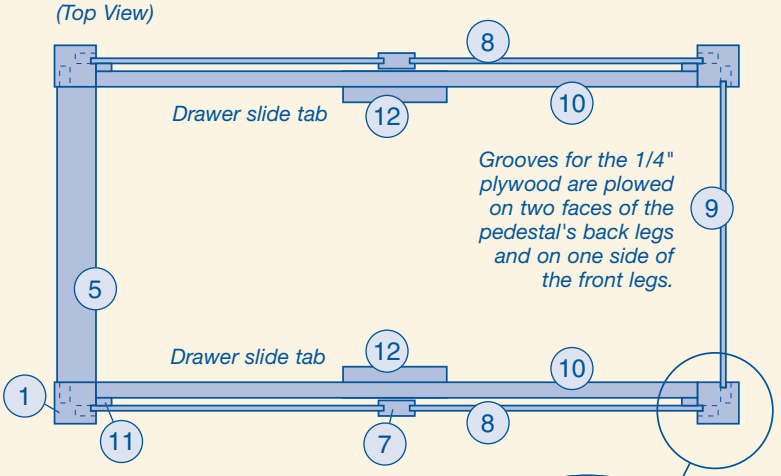
Long Bottom Rail
(Front View)



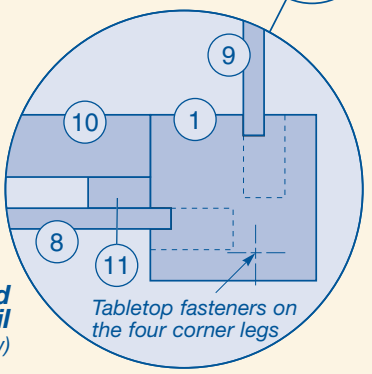


Long Bottom Rail
(End View)

Drawer Pedestal
(Top View)

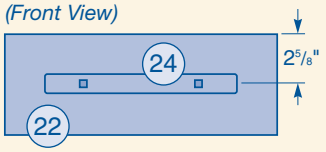


NOTE: *The drawer slide spacers (pieces 11) are 1/8" oversized on the* Material List. *Test-fit the pieces before you mount them in place. It is important that the spacers hold the drawer slide supports exactly flush to the inside face of the legs.*

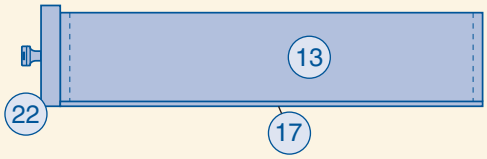


Leg, Panel, Spacer and Support Joinery Detail
(Top View)

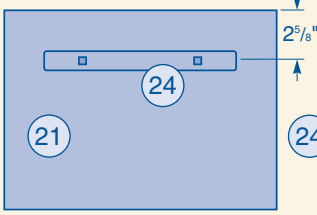
Small Drawer
(Front View)



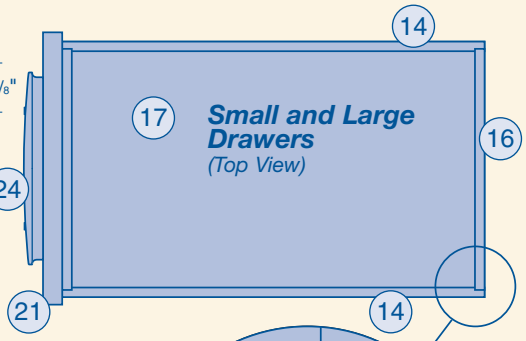
Small Drawer
(Side View)



Large Drawer
(Front View)

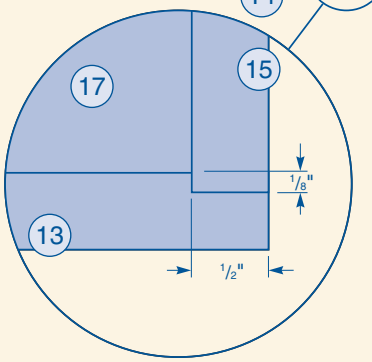


Small and Large Drawers
(Top View)



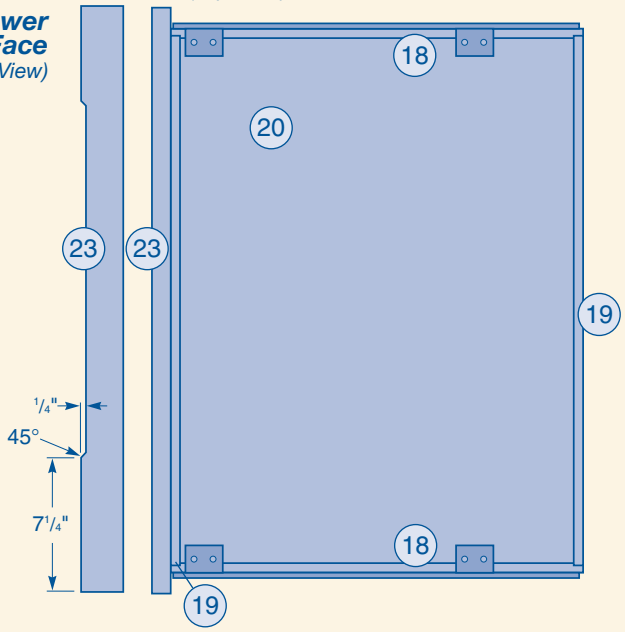
Note: *The drawer pulls (pieces 24) are centered on the faces of the four small drawers. The drawer pulls on the large drawers match their placement on the small drawers (see above).*

Small and Large Drawer Corner Detail
(Top View)



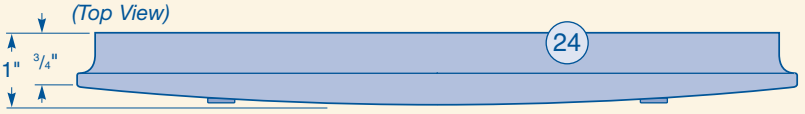
Pencil Drawer
(Top View)

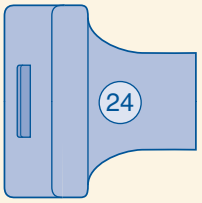
Pencil Drawer Face
(Front View)



Note: *Mount the drawers to allow for 1/16" clearance. Adjust the drawer faces within the drawer openings by means of oversized pre-drilled screw holes and washer head screws.*

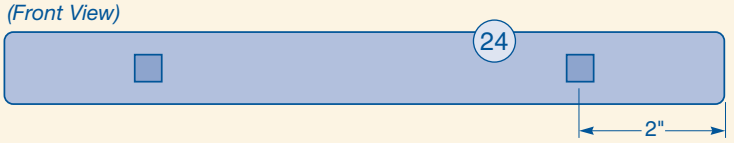
Drawer Handle
(Top View)



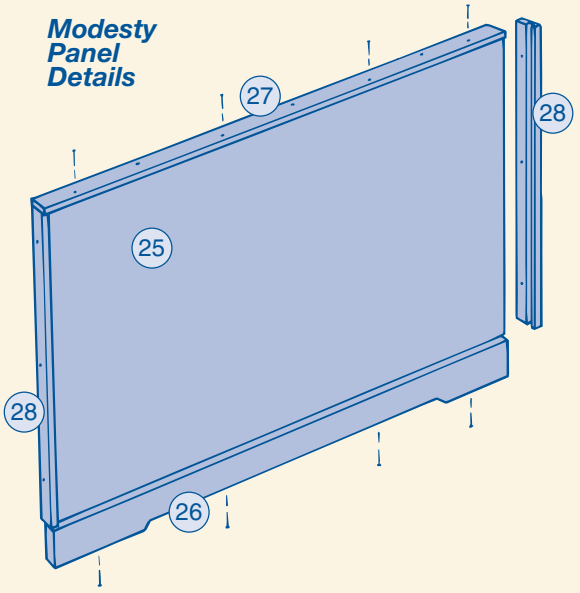


Drawer Handle
(End View) Full-Size

Drawer Handle
(Front View)

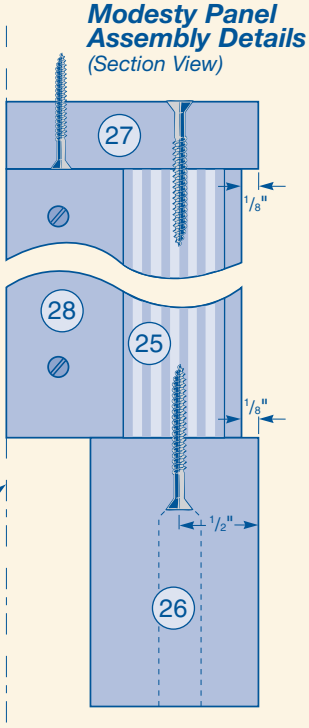


Modesty Panel Details

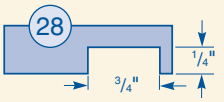


Note: *The upper and lower modesty panel rails are simple butt joints secured with glue and screws. The modesty panel end stiles are grooved and then glued and clamped in place. The modesty panel subassembly is mounted to the desk with screws only, at the time the desk is assembled (where it will be used).*

Modesty Panel Assembly Details
(Section View)



The modesty panel subassembly's back edge is mounted flush to the inside edge of the leg.



Modesty Panel End Stile
(Top View)