

Kitchen Base Cabinet with Door and Drawer



MLCS Products Used:

#8376/6076 3-Piece Plywood Straight Bit Set or
#7790/5490 5.2mm (13/64”), #7795/5495 18.2mm (23/32”) Straight Bits

#7694 3/4” Rabbeting Bit

#8613 European Door Edge Bit

#7695 1” 14-Degree Dovetail Bit

#7733 2-Piece Edge Banding Bit Set

#7804 1/2” Flush Trimming Bit

#9322 Shelf Pin Jig Kit

#9012 Merle Band Clamp

#9546 or #9548 Coping Safety Sled

#9370H 5/64” Flash Bit

#9489 Double Faced Tape

#9365H 5-Piece Quik Change drill Bit and Countersink Set

For Solid Panel Door:

#8389 6-Piece Pro Cabinetmaker Set with Undercutter or,

#8847/6547 Ogee Rail and Stile, #8698 Ogee Raised Panel Bit with Undercutter,

#7853/5553 Reverse Glue Joint Bit, and #7852/5552 Drawer Lock Bit

For Glass Panel Door:

#8845 Matched Rail and Stile for Glass Doors with Recoverable Bead

#7852/5552 Drawer Lock Bit

Additional Tools and Materials Used:

- Router Table
- Hand Drill
- Ruler or Tape Measure
- Jigsaw or Bandsaw
- 1-1/4" Wood Screws
- 1/4" Shelf Support Pins (4)

The following items below are only needed, if you are making the Glass Panel Door:

- Hammer
- Nail Set Punch
- 5/8" Brads

Constructing the Cabinet Carcass:

From a sheet of 3/4" cabinet grade plywood, cut the two cabinet sides to a size of 23-1/4" x 34-1/2". There is an "A" or premium side (free of knots and any wood filler) and a "B" side (may have knots, wood filler or obvious veneer mismatch lines showing) on most cabinet grade plywood. We will be making the "B" side the inside of our cabinet.

The next step is to layout the lines for our dadoes for the fixed bottom shelf of the cabinet, both drawer support frames, and rabbet along the back edge for the cabinet back. In addition, we need to create a 2-1/2" x 4" toe kick at the bottom front edge of the cabinet side. Once these are clearly marked, use a jigsaw or bandsaw to cut the notch for the toe kick. Install the 18.2mm (23/32") straight bit and adjust the cutting depth to 3/8". Cut the dadoes for the bottom shelf and both drawer supports on the upper part of the cabinet (See Figures A, B, and C).

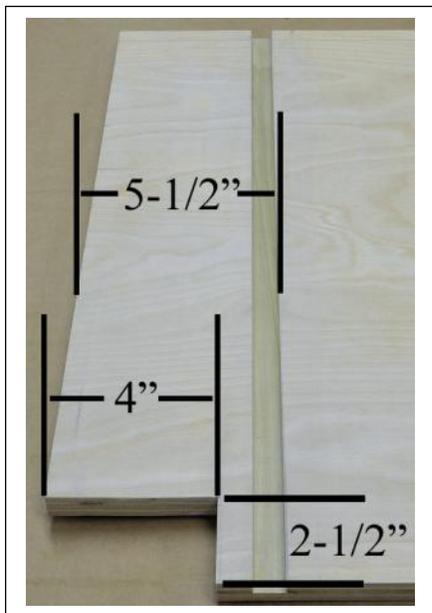


Figure A

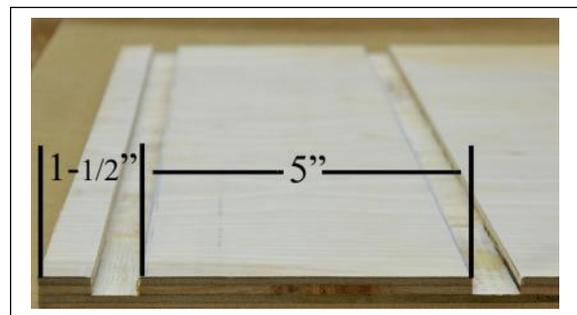


Figure B

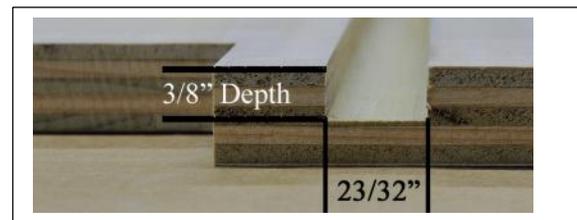


Figure. C

Next thing to cut is the 3/4" wide rabbet along the entire length of the back inside edge of the carcass sides to accept the cabinet back (See Figure D).

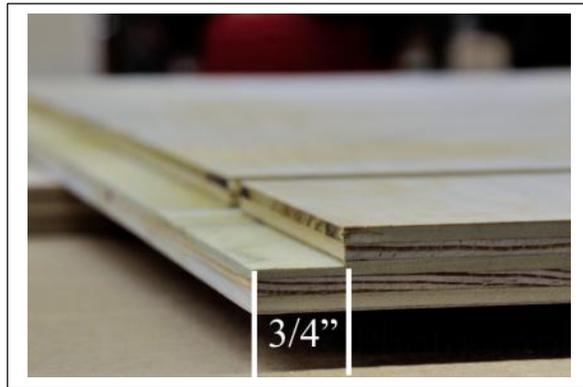


Figure D

From the remaining 3/4" cabinet grade plywood, cut the shelf bottom to a size of 22-1/2" x 20-1/4" and the cabinet back to a size of 20-1/4" x 30". Next make the drawer supports by cutting four pieces of the 3/4" plywood to a length of 20-1/4" x 2" wide and another four pieces to a length of 18-5/8" x the same 2" wide. Two shorter support pieces will be glued between the two of the longer support pieces to make a rectangular frame using a simple 90-degree butt joint. You will be making two of these drawer support frames (See Figure E).

While the glue is drying on the drawer supports, you can use the shelf pin drilling jig to make the holes for the adjustable shelf pin supports. It is easy to start by using the dado slot as an end gauge for placing the shelf pin jig (See Figure F).



Figure E

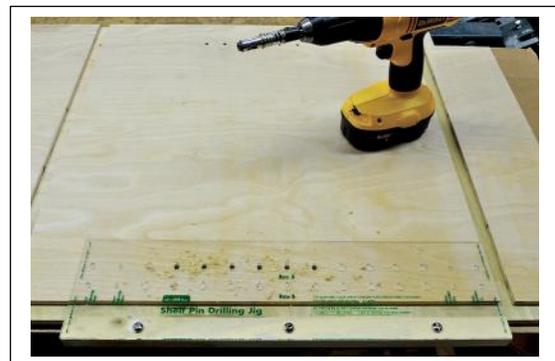


Figure F

Once the glue has dried on both frames and they have been removed from the Merle clamps, apply glue to the dado slots in both the left and right cabinet carcass sides along with the rabbet from the top of the side down to the bottom of the dado slot for the cabinet back. Work quickly to insert the bottom shelf and both drawer support frames into the dado slots. Place the

drawer back in the rabbet to help keep the cabinet carcass from racking, keeping it square while you apply bar clamps to secure the assembly (See Figure G).



Figure G

Making the Drawer:

While the glue is drying on the cabinet carcass, we can start to make the drawer box. Using 3/4" hardwood, cut two drawer box sides to a length of 22-1/4" x 4-7/8" wide and a drawer box front and back to 17-3/4" x 4-7/8" wide. Using the drawer lock router bit, make the joinery cuts across the ends of these boards. The drawer sides will get cut vertically, while the drawer front and back will be cut laying flat on the router table (See Figures H and I).

There are instructions you can download from the MLCS website and an instructional video you can view regarding set up and use of this bit along with a set up block (#9783) for adjusting the bit height and fence position for the initial cuts.



Figure H



Figure I

A 5.2mm(13/64") wide x 3/8" deep slot needs to be created to accept the plywood drawer bottom. The slot gets cut completely through on the drawer sides, but is stopped on the drawer

box front and side and is only cut from the drawer bit slot to drawer lock bit slot to keep it from being visible. Make sure to leave 5/16" below the slot to support the drawer bottom (See Figure J).



Figure J



Figure K

Apply glue to the tongue and groove of the drawer box sides. Slide the drawer box front and back into the drawer box side. Slide the plywood drawer bottom into the slot and finish the drawer box by applying glue to the other drawer box side and fitting that into the drawer box front and back. Work quickly to fit the Merle band clamp in place to secure the joinery until the glue has dried (See Figure K).

Making the Drawer Slides:

Using 3/4" hardwood cut two pieces of 5" wide stock to a length of 22-1/2" for the wooden drawer slides. We will be using the 1" diameter, 14-degree dovetail bit to create the wooden dovetail slides. The dovetail bit needs to be set to a cutting height of 3/8", or half of our stock thickness. Start the cut by taking a little off of each edge. Move the fence a small amount between passes. I like to remove no more than 1/4" to 3/8" per pass until the cut is complete. We are looking to create a 2" wide male dovetail when finished (See Figure L).



Figure L



Figure M

The next step is to cut the corresponding 2" wide female dovetail in the sides of the drawer box. Start the cut with the dovetail set at the same height and start cutting in the center of

the drawer box side and work your way outward (See Figure M). As you approach the 2" width, periodically check the fit to see if the male dovetail will fit into the female dovetail being cut in the drawer box side. We do not want too loose of a fit or the drawer will bind on the cabinet face frame. The male dovetail should just slide in the female dovetail with the slightest of effort and drag. A wood wax can be applied to the male dovetail to reduce drag and facilitate a smoother glide when the routing process is complete. The face frame will be applied to the cabinet carcass before the drawer and glides are fitted in position.

Putting the Face Frame on the Front of the Cabinet Carcass:

The face frame is cut from 1-1/2" wide hardwood stock. The two outer rails are cut to a length of 30-1/2". The three cross rails are cut to a length of 18". The face frame will be attached to the cabinet carcass with only wood glue. I prefer to lay the cabinet carcass on a box on it's back to apply the face frame and allow me to use bar clamps to hold the pieces until the glue dries. Start by applying a bead of wood glue along the edge of the cabinet carcass. Place the stile so it is flush with the outside edge of the cabinet side and clamp in position. Repeat for the other side (See Figure N). The three cross rails are next. The bottom is to be glued flush with the lower shelf. The two upper cross rails are to be placed flush with the drawer support frames (See Figure O).

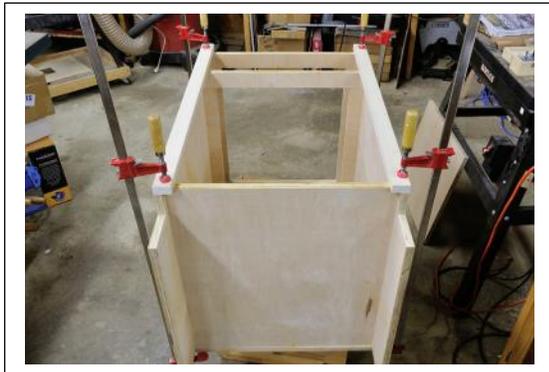


Figure N



Figure O

Installing the Drawer Slides into the Cabinet Carcass:

The dovetail drawer slides are going to be mounted in between the upper and lower drawer support frames. To locate them in the correct position, temporarily place them in between the drawer support frames. They should fit very snugly and stay in position without any fasteners at this time. Slide the drawer box into the carcass, engaging both male dovetails into the female dovetails on the sides of the drawer box. Center the drawer box in the drawer opening in the carcass. Check to make sure that the drawer slides easily in and out (See Figure P).



Figure P



Figure Q

Carefully remove the drawer without moving the position of the drawer slides in the carcass. Use a pencil to mark the position of each drawer slide and then remove them from the carcass. Place a bead of glue along the pencil line and at the top edge of the drawer slide. Tilt the drawer slides as you reposition them within the carcass between the shelf support frames, making sure to position them along the layout lines (See Figure Q). You can add small diameter brads to secure them until the glue dries if you choose.

The Raised Panel or Glass Door needs to be made next. Please decide which you plan to use on your cabinet.

Making the Solid Panel Door:

Cut enough 3/4" stock to make a panel that will be at least 15" wide x 18" long when glued up. To make the glue joint cuts on the panel, use the reverse glue joint bit. ***(There are instructions you can download from the MLCS website and an instructional video you can view regarding set up and use of this bit along with a set up block (#9780) for adjusting the bit height and fence position for 3/4" stock).*** Apply glue to the tongue and groove and place the glued up panel assembly in a clamp while the glue dries. After removing the panel from the clamp, sand the panel surfaces smooth and flat to remove any minimal differences in stock thickness. Cut the panel to a finished size of 14-1/8" x 17-1/2". Install the raised panel bit in the table-mounted router. Make a series of shallow passes increasing the cutting depth each pass until you complete the full profile and your final pass is against the pilot bearing.

Cut the 2-1/2" wide rails to a finished length of 14-1/2". Cut the 2-1/2" wide stiles to a finished length of 21-1/2". Install the rail or coping bit into the router table to cut the reverse of the profile and tongue on the ends of your rails. A safety coping sled is recommended to support the rails while cutting across the end grain. Cut all four rail ends. Remove the rail bit and install the stile bit to create the profile and panel slot to the stiles and rails. Run the full length of the inside edge of each stile and rail. ***(There are instructions you can download from the MLCS website regarding set up and use of these bits along with a set up block (#9741) for adjusting the bit height and fence position).***



Apply glue to ends of the rails in where the profile and tongue will fit into the stile. Working quickly, slide one rail into the top and bottom of one stile. Slide the panel into the 1/4" panel slot and complete the door by fitting the second stile to the rails. Set in the Merle clamp while the glue dries. When the glue has finished drying, the European door edge bit is used to create a decorative "ogee" shaped profile around the outside edge of the door. Start by cutting across the top and bottom and finish with the sides to clean up any tear out you may get as the bit finishes cutting the end grain at the bottom of the stile.

Making the Glass Panel Door:

Cut two 2-1/2" wide rails to a finished length of 14-3/4". Cut two 2-1/2" stiles to a finished length of 21-1/2". Install the rail or coping bit into the router table to cut the reverse of the profile on the ends of your rails). A safety coping sled is recommended to support the rails while cutting across the end grain. Cut all four rail ends. Remove the rail bit and install the stile bit to create the profile, recoverable bead and rabbet for the glass on the stiles and rails. Run the full length of the inside edge of each stile and rail. (*There are instructions you can download from the MLCS website regarding set up and use of these bits*). After cutting the profile, you will notice that there are two profiles and the one protrudes an additional 1/8" past the other. The one that is protruding will become the retaining strip to secure the glass in the door. That needs to be cut off from the rail and stile at the point where it is flush with the rabbet. Once that is done, the doorframe can be assembled.

Apply glue to ends of the rails in where the profile fit into the stile. Working quickly, slide one rail into the top and bottom of one stile and complete the door by fitting the second stile to the rails. Set in the Merle clamp while the glue dries. When the glue has finished drying, the European door edge bit is used to create a decorative "ogee" shaped profile around the outside edge of the door. Start by cutting across the top and bottom and finish with the sides to clean up any tear out you may get as the bit finishes cutting the end grain at the bottom of the stile.

Next, the retaining strips can be fitted to the glass opening. The two that were removed from the rail are already the proper length. They just need the 45-degree cut on the end for the corner miter joint (See figure R). The two that were removed from the stile will need to be cut to the length of the vertical opening for the glass, or 17-5/8" long. The ends need to have the 45-degree miter cut on them as well. I prefer to attach these retaining strips with small 5/8" long brads in case they need to be removed in the future to replace the glass should it break. Drilling small pilot holes for the brads is recommended before you attempt to install the retaining strips (See Figure S). I prefer to drill three holes in the shorter retaining strips and four in the longer retaining strips to secure the glass panel in place. The glass panel will then drop into the rabbet. Place the retaining strips in place and use a nail setting punch to seat the brads into the rails and stiles (See Figure T).



Figure R

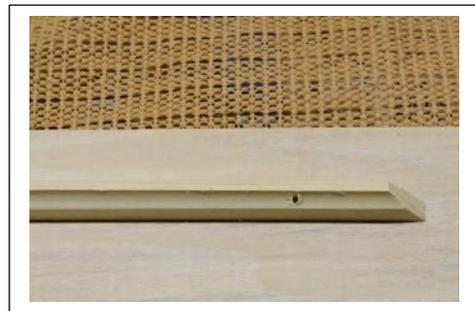


Figure S

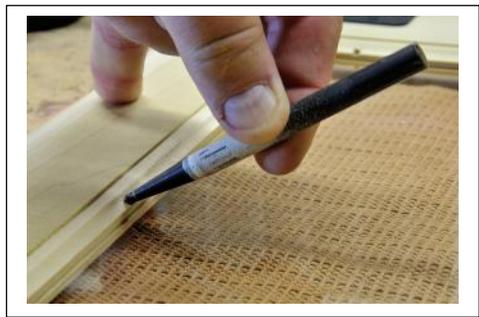


Figure T



Figure U

Attaching the Door to the Cabinet:

We are using a simple surface mount hinge to attach our overlay door to the cabinet. Start by placing the door face down on the workbench. I prefer placing the hinges 2-1/2" from the top and bottom of the door. Use the center finding flash bit to center the pilot hole in the hinge screw hole (See Figure U). The screws are very short in length; so do not drill the pilot hole more than 3/16" deep. Secure the hinge to the backside of the door. Use a handheld screwdriver as a power driver may cause you to over tighten and strip the threads in the wood or damage the finish on the screw heads. Flip the door over and position the door over the opening in the cabinet frame (*This is easier to accomplish if you have the cabinet laying on it's back*) Once again use the center finding flash bit to drill the pilot holes for the hinge in the face frame. Secure the hinge to the face frame. Again, a handheld screwdriver is preferred to tighten the fragile, small screws. To finish the door, drill the hole for the fastener to secure the knob or pull you plan to use to the stile.

Attaching the Drawer Front to the Drawer Box:

Cut the drawer front to the finished size of 18-1/2" x 6". Drill four holes, one about 1" from the top, 1-1/2" from the bottom and 2" in from the sides of the drawer box through the drawer box front that will be used to attach the drawer front to the drawer box. Drill and countersink the holes from the back of the drawer front to accept the drawer pull hardware. The holes are countersunk to allow the drawer front to sit flush against the drawer box front. Attach the pull to the drawer front. To determine the correct position on the drawer box and to align it with the door, double faced tape can be used to temporarily hold it in place (See Figure V).

Remove the drawer box/drawer front together and use four 1-1/4" screws to secure the drawer front to the drawer box (See Figure W).



Figure V



Figure W

Making the Adjustable Shelf:

The adjustable shelf will be made using 3/4" cabinet grade plywood with solid hardwood edge banding on the front and back edges. Cut the plywood to a size of 19-3/16" x 18-1/2". From 1-1/2" wide hardwood, cut two pieces to a lengths of 19-3/16". Install the bit from the edge banding set that creates the 60-degree bevel and slot into the router table. Rout the 19-3/16" long edges only of the plywood shelf. The slot should be centered in the middle of your stock thickness (See Figure X). Once both edges are complete, change to the bit that creates the opposing 60-degree bevel and tongue. Once again, align the tongue in the middle of your stock thickness. Rout one edge of the solid hardwood that will become the edge banding (See Figure Y). *(There are instructions you can download from the MLCS website and an instructional video you can view regarding set up and use of these bits).*



Figure X



Figure Y

Apply glue to the slot and bevel on the plywood and attach a piece of hardwood edge banding to the front and back of the adjustable shelf. The solid wood edge banding is slightly thicker than the plywood. Use the flush trim bit with the panel run vertically to flush trim the edge banding to the plywood. Use 1/4" shelf support pins to set the shelf inside the cabinet at your desired height.



Cut List

Carcass Sides (2)	23-1/4" x 34-1/2" x 3/4" cabinet grade plywood
Carcass Back (1)	20-1/4" x 30" x 3/4" cabinet grade plywood
Carcass Bottom (1)	23-1/4" x 20-1/4" x 3/4" cabinet grade plywood
Face Frame Stiles (2)	30-1/2" x 1-1/2" x 3/4" hardwood
Face Frame Rails (3)	18" x 1-1/2" x 3/4" hardwood
Shelf Supports (4)	20-1/4" x 2" x 3/4" cabinet grade plywood
Shelf Supports (4)	18-5/8" x 2" x 3/4" cabinet grade plywood
Shelf (1)	19-3/16" x 18-1/2" x 3/4" cabinet grade plywood
Edge Banding (2)	19-3/16" x 1-1/2" x 3/4" hardwood
Drawer Box Sides (2)	22-1/4" x 4-7/8" x 3/4" hardwood
Drawer Box Front (1)	17-3/4" x 4-7/8" x 3/4" hardwood
Drawer Box Back (1)	17-3/4" x 4-7/8" x 3/4" hardwood
Drawer Bottom (1)	22" x 16-3/4" x 1/4" plywood or hardboard
Drawer Front (1)	18-1/2" x 6" x 3/4" hardwood
Drawer Slides (2)	22-1/2" x 5 x 3/4" hardwood
Solid Panel Door:	
Stiles (2)	21-1/2" x 2-1/2" x 3/4" hardwood
Rails (2)	14-1/2" x 2-1/2" x 3/4" hardwood
Center Panel (1)	14-1/8" x 17-1/2" x 3/4" hardwood glue up
Glass Panel Door:	
Stiles (2)	21-1/2" x 2-1/2" x 3/4" hardwood
Rails (2)	14-3/4" x 2-1/2" x 3/4" hardwood