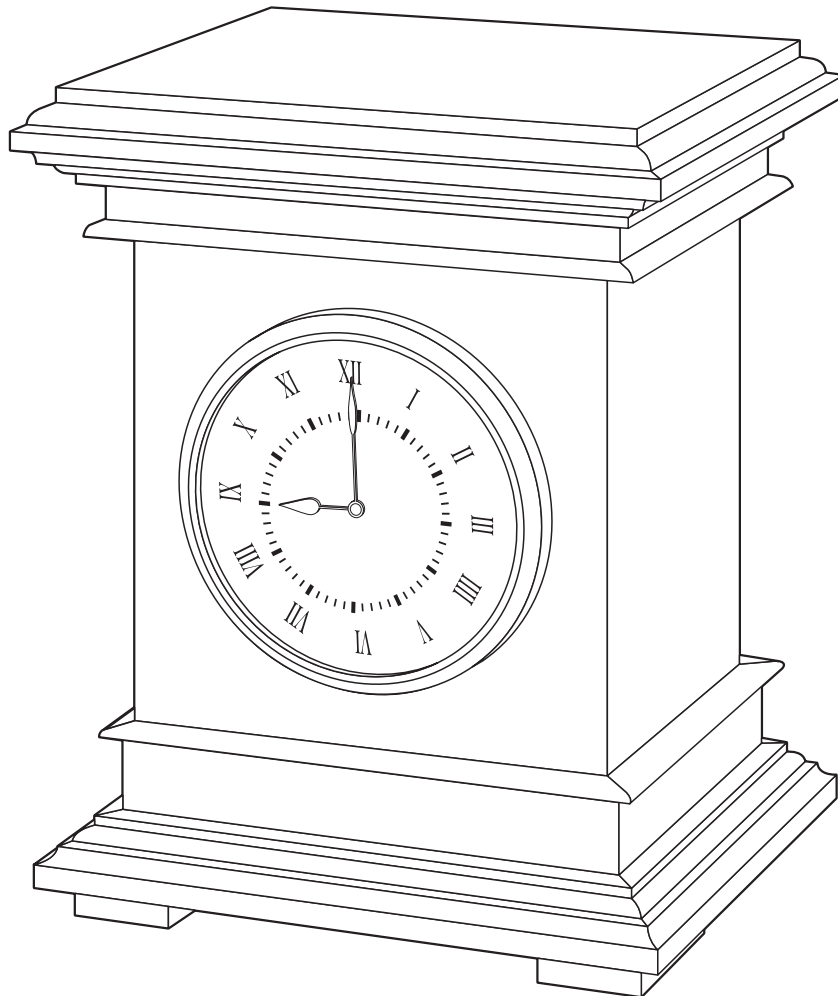




**WOODWORKS: ADVANCED PROJECT 2005-2006**  
**DESKTOP CLOCK**



This clock holds a secret chamber under the lid, and its construction involves a few secrets as well. The case is made from 1/2"-thick cherry plywood, which isn't available at most lumberyards. You can simply make your own by gluing together two pieces of 1/4" cherry plywood. Another secret to building this clock is to glue the moldings to the plywood case material first and then miter the parts on the table saw as a single piece. It simplifies the building and sure beats mitering all the moldings individually.

Advanced woodworkers will be challenged to execute this project neatly and precisely. You'll be doing a lot of router work to make the moldings and some precision rabbetting, dadoing and mitering to put all the pieces together. After it's assembled, you'll learn more about applying and using stains and finishes to protect the wood and keep it looking beautiful.

**TOOLS REQUIRED****Hand Tools**

- Backsaw
- Miter box
- Spring clamps
- Toggle clamps

**Power Tools**

- Table saw
- Planer
- Router in a router table; a classic router bit and a 1/8" round-over bit
- Drill press with an adjustable circle cutter

**Miscellaneous**

- Pencil
- Safety glasses
- Carpenter's glue
- Masking tape
- 120-, 150- and 220-grit sandpaper
- Clean, lint-free cloths
- Respirator
- Gloves for finishing
- Mineral spirits (for oil-based stains and finishes)
- Water-filled metal container with tight-fitting lid (for oil-based stains and finishes)
- Minwax™ Wood Finish™ Stain Brush or other good quality, natural bristle brush (for oil-based stains and finishes)
- Minwax™ Polycrylic™ Brush or other good quality, synthetic bristle brush (for water-based stains and finishes)

**CUTTING LIST**

Overall Dimensions: 8" x 6-3/8" x 5-3/8"					
Key Part	Pcs.	Material	Dimensions	Notes	
A Front, back	2	cherry	1/2" x 4-3/4" x 7-1/2"	Cut to final widths after attaching moldings C through K.	
B Sides	2	cherry plywood	3-3/4" x 7-1/2"		
C Upper flat trim (front/back)	2	cherry	1/8" x 3/8" x 5"		
D Upper flat trim (sides)	2	cherry	1/8" x 3/8" x 4"		
E Lower flat trim (front/back)	2	cherry	1/8" x 3/4" x 5"		
F Lower flat trim (sides)	2	cherry	1/8" x 3/4" x 4"		
G Top classic molding (front/back)	2	cherry	5/8" x 3/4" x 6-1/4"		
H Top classic molding (sides)	2	cherry	5/8" x 3/4" x 5-1/4"		
J Bottom classic molding (front/back)	2	cherry	3/4" x 3/4" x 6-1/4"		
K Bottom classic molding (sides)	2	cherry	3/4" x 3/4" x 5-1/4"		
L Half-bead trim (front and back)	4	cherry	1/8" x 5/16" x 5-1/8"		
M Half-bead trim (sides)	4	cherry	1/8" x 5/16" x 4-1/8"		
N Lid	1	cherry	3/4" x 4-5/8" x 5-5/8"		
P Half-bead trim for lid (front/back)	2	cherry	1/8" x 5/16" x 6"		
Q Half-bead trim for lid (sides)	2	cherry	1/8" x 5/16" x 5"		
R Bottom	1	cherry	1/2" x 3-1/4" x 4-1/4"		
S Feet	4	cherry	5/16" x 1" x 1"		

Recommended Wood - Cherry

Alternate Wood - Mahogany

**SHOPPING LIST**

Item	Quantity
1/4" cherry-veneer plywood	16" x 32" sheet; grain should run across the short dimension.
3/4" cherry	3" wide by 32" long, 1 pc. 3/4" x 6" x 48", 1 pc.
Battery-powered clock mechanism (see Source, page 5)	

**WOOD FINISHING PRODUCTS****Recommended Finish**

- Prep: Prep: Minwax® Pre-Stain Wood Conditioner (if using soft or porous wood)
- Stain: Minwax® Wood Finish™ English Chestnut (or your choice of 20 Minwax® Wood Finish™ Stain colors)
- Finish: Minwax® Fast-Drying Polyurethane Semi-Gloss

**Alternate Finish**

- Prep: Minwax® Water-Based Pre-Stain Wood Conditioner
- Stain: Minwax® Water-Based Wood Stain Spice (or a Minwax® Water-Based Stain of your choice, available in 6 wood tones, a White Wash Pickling Stain, 60 custom-mixed colors, and 8 bold Accents™ colors)
- Finish: Minwax® Polycrylic® Protective Finish Semi-Gloss

## BEFORE YOU BEGIN

Good craftsmanship begins and ends with good work habits, so make the following steps part of your routine workshop practice. If you have any doubts or questions about how to proceed with a project, always discuss them with your instructor.

- Carefully and fully review plans and instructions before putting a tool to the project lumber.
- Work sensibly and safely. Wear safety goggles and the appropriate respirator whenever making sawdust or working with thinners or other solvents.
- At the end of every work session, clean up your shop area and put away all portable tools.

## CUTTING AND ASSEMBLY PROCEDURE

1. Cut two 32" x 8" pieces of 1/4" cherry plywood so that the grain runs across the short dimension. Glue them together to form the 1/2" plywood needed for the clock case. Use a few bricks as clamps and a piece of cardboard to protect the plywood from getting scratched. After the glue has dried, rip the plywood to 7-1/2" wide. Take about 1/4" off each edge so they are both straight and parallel. Next, cut two 1/8" dadoes in the face of the plywood (Fig. 1). Use a push block for safety and to maintain even pressure while cutting.

2. Make the upper and lower flat trim pieces (C, D, E and F). Insert temporary spacer strips (use no glue) in the small dadoes in the panel to provide a stop for the flat trim to push up against, and glue the flat trim to the plywood panel (Fig. 2). Remove the spacer sticks before the glue dries to prevent them from getting stuck.

3. Cut a strip of cherry for the top and bottom moldings (G, H, J and K). Use feather boards to hold the molding against the fence and table for the smoothest cut. Shape these pieces with a classic router bit. Note that the top moldings are 1/8" thinner than the bottom moldings and they are attached to the plywood so they mirror each other (Fig. 1). Glue and clamp them to the plywood (Fig. 3). The edge of the molding and the plywood should be flush. If they're not, wait until the glue has dried and trim the parts flush on your table saw. Complete the plywood panel by cutting a rabbet at the top and bottom on the backside (Fig. 1).

4. Make the half-bead trim (L, M, P, Q) that goes around the case and the lid. This trim is very small, but is easy to make using the step-by-step cutting sequence shown in Fig. 5. Apply a thin bead of glue to the pieces that wrap around the case (L, M) and clamp them into the 1/8" x 1/8" dadoes previously occupied by the spacer sticks. If any glue squeezes out, wipe it away immediately with a damp sponge or towel.

5. Set your table saw blade to 45 degrees and use a table saw sled to miter the clock's four sides. Start by cutting the sides about 1/4" oversize. Then miter the sides to their final width. Hold each piece in place with a toggle clamp to ensure a straight cut and to keep your hands out of harm's way.

**Woodworker's Tip:** *Cut slowly to avoid chip-out on the moldings. If you do get a chip, save it and glue it back on. Use a toothpick to apply the glue and masking tape to hold the chip in place.*

6. Drill the opening for the clock insert into the front panel. The clock insert is centered vertically on the front between the two half-bead trim pieces (L). Set the drill press to its slowest speed and hold the part with two toggle clamps. Secure a backer board to the drill table with a couple of clamps. The backer board will ensure that the cutter makes a clean cut on the backside.

7. Apply glue to two sides first and hold them together with masking tape. Add the other two sides one at a time. Grasp the tape firmly and pull the parts tightly together. Then glue in the bottom and add the four feet (S) 1/8" in from the edges of the molding. Next make the lid (N). Cut the rabbets on the bottom of the lid (Fig. 4). Check that the lid fits easily into the rabbet in the top of the clock case.

8. Using a small backsaw and a miter box, miter the half-bead trim that goes around the lid (P, Q) and attach it to the underside of the lid (Fig. 6). You'll need some small spring clamps to hold these trim pieces in place while the glue dries. Remove one of the plastic jaw covers from the spring clamp to provide more pressure on the small trim. Leave the other jaw cover on to protect the top from getting dented.

## STAINING AND FINISHING

**Woodworker's Tip:** *Though you may be tempted to cut short your sanding, preparation and application time, don't do it. These tasks are very important steps in obtaining a high-quality finish. Remember, it is the finish, just as much as the fit and smoothness of the parts that will have great bearing on how people judge your craftsmanship. To ensure an excellent result, follow the steps listed in this section and also the instructions the finish manufacturer puts on its products.*

### FINISHING TIPS

- Test the stains and finishes you are planning to use on scraps of wood. On the back of the scrap, mark the stain/finish combination and the type of wood. Allow all samples to dry thoroughly before making your final finish selection. Save your samples for quick reference on future projects.
- All stains and finishes must be allowed to dry thoroughly between coats. Remember that drying times can vary due to humidity and other climatic conditions.
- If you have some leftover stain or finish, wipe the can rim so that stain or finish in the rim won't dry out and prevent the lid from forming a tight seal.
- Brushes used for water-based products, such as Minwax® Water-Based Wood Stains or Minwax® Polycrylic® Protective Finish, should be cleaned with soap and water; oil-based finishes must be cleaned with mineral spirits.

9. Sand all pieces with 120-grit paper, then move up to 220-grit to complete the pre-finish smoothing. Use an orbital sander and with-the-grain sanding strokes to remove any marks or scratches. Wipe the piece carefully with a clean, lint-free cloth lightly dampened with mineral spirits.

**Recommended Finish**

**10.** Apply the Minwax® Wood Finish™ you've chosen to the interior surfaces using a natural bristle brush and a clean, lint-free cloth following the directions on the can. The brush will help you get the stain into the many inside corners and other tight spots. Allow the Wood Finish™ to set for about 5 to 15 minutes, then wipe off any excess. To achieve a deeper color, you may apply a second coat after 4-6 hours, repeating the application directions for the first coat. Allow the stain to dry for 24 hours before applying the protective clear finish.

**Woodworker's Tip:** *When wiping off stain, make certain that your last wipe with the cloth goes with the grain of the wood. This way, any stain you might miss during wipe-off will be visually minimized by the wood grain.*

**11.** Apply Minwax® Fast-Drying Polyurethane following the directions on the can. Use a good quality, natural bristle brush. Allow the first coat to dry overnight.

**12.** The next day, sand all surfaces lightly with 220-grit or finer sandpaper using with-the-grain strokes. Wipe all surfaces with a cloth lightly dampened with mineral spirits. Apply a second coat of polyurethane and set the piece aside to cure overnight.

**13.** The following day, sand all surfaces lightly with 220-grit paper. Wipe the piece with a cloth lightly dampened with mineral spirits and apply the third and final coat of polyurethane. When the polyurethane is dry, apply a thin bead of glue to the trim pieces (L, M) and clamp them to the clock case. If any glue squeezes out, wipe it away immediately with a damp sponge or paper towel. Allow the piece to cure for a few days before installing the clock mechanism. It's simply a pressure fit and requires no fasteners.

**Alternate Finish**

Before applying Minwax® Water-Based Wood Stain to a hardwood or softwood, apply Minwax® Pre-Stain Water-Based Wood Conditioner following the directions on the can. After 1 to 5 minutes, wipe off all excess conditioner using a clean, lint-free cloth. Wait 15 to 30 minutes then use fine-grade sandpaper to sand off any "whiskers" raised by the conditioner. Proceed to the staining within 2 hours.

**14.** Apply the Minwax® Water-Based Wood Stain you've chosen using either a nylon/polyester brush or soft cloth. Allow stain to penetrate no longer than 3 minutes. While stain is still wet, wipe off all excess with a clean cloth that's been lightly dampened with stain. Allow the piece to dry for 2 hours before applying a second coat, if desired. Allow the pieces to dry overnight before assembling and applying the protective clear finish.

**Woodworker's Tip:** *Minwax® Water-Based Wood Stain is available in 6 factory wood tones, a White Wash Pickling Stain, 60 custom-mixed colors, and 8 bold Accents™ colors. This means that you are not limited to just traditional wood colors (pine, oak, walnut, etc.). Instead, you can actually pick and apply a color to complement the décor of the room in which the clock will be placed. For this reason, make sure you look over all of the Minwax® color charts or go to [minwax.com](http://minwax.com) before making your final selection.*

**15.** After allowing the assembled piece to dry overnight, apply Minwax® Polycrylic® Protective Finish following the directions on the can. Stir the can contents thoroughly before starting and periodically repeat the stirring during your work session.

**16.** Working a small area at a time to maintain a wet edge, apply the first coat. Work quickly and make the final strokes in each newly finished section using with-the-grain brushstrokes.

**17.** Allow the finish to dry a minimum of 2 hours. Then sand lightly with 220-grit or finer sandpaper wrapped around a soft backup block. Thoroughly wipe all surfaces with a cloth lightly dampened with water.

**18.** Repeat steps 15 and 16 to apply the second and final coat. Allow the piece to cure for a few days before installing the clock mechanism. It's simply a pressure fit and requires no fasteners.

**PRODUCT SAFETY**

For your safety and the safety of those you work with, always read the safety warnings, which manufacturers print on their labels, and follow them to the letter. Typical safety advice and instructions will contain information such as the following:

**WARNING!** Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

**When using oil-based wood finishing products:**

**CAUTIONS: CONTAINS ALIPHATIC HYDROCARBONS. Contents are COMBUSTIBLE.** Keep away from heat and open flame. **VAPOR HARMFUL.** Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved) or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

**FIRST AID:** In case of eye contact, flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. If swallowed, call Poison Control Center, hospital emergency room, or physician immediately.

**NOTICE:** Reports have associated repeated and prolonged occupational exposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

**DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.**

**When using water-based wood finishing products:**

**CAUTIONS:** Use Only With Adequate Ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved), or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

**FIRST AID:** In case of eye contact, flush thoroughly with large amounts of water. Get medical attention if irritation persists. If swallowed, get medical attention immediately.

**WARNING:** Contains Alkyl propanols, ethylene glycol, n-methyl pyrrolidone. **VAPOR HARMFUL.** Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved) or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

**DO NOT TAKE INTERNALLY.**

**FIRST AID:** In case of eye contact, flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. If swallowed, call Poison Control Center, hospital emergency room, or physician immediately.

**DELAYED EFFECTS FROM LONG-TERM OVEREXPOSURE.**

Contains solvents which can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

**KEEP OUT OF REACH OF CHILDREN.**

**SAFE DISPOSAL OF RAGS AND WASTE.**

**DANGER:** Rags, steel wool, other waste soaked with this product, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled, metal container. Dispose of in accordance with local fire regulations.

**Source**

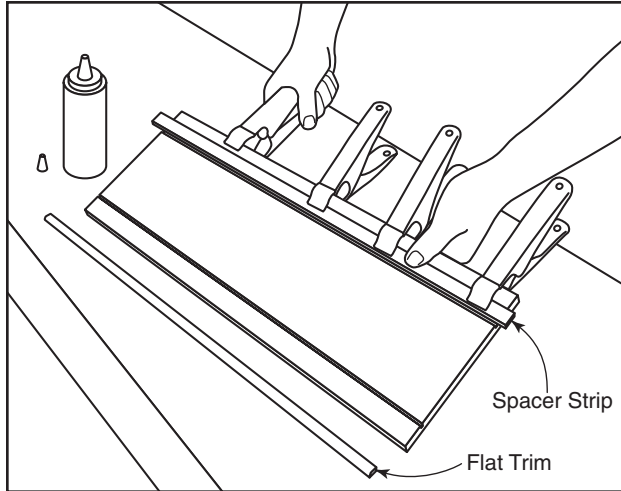
Clock insert, #23995, \$10.59  
Rockler Companies, Inc.  
(800) 279-4441  
www.rockler.com

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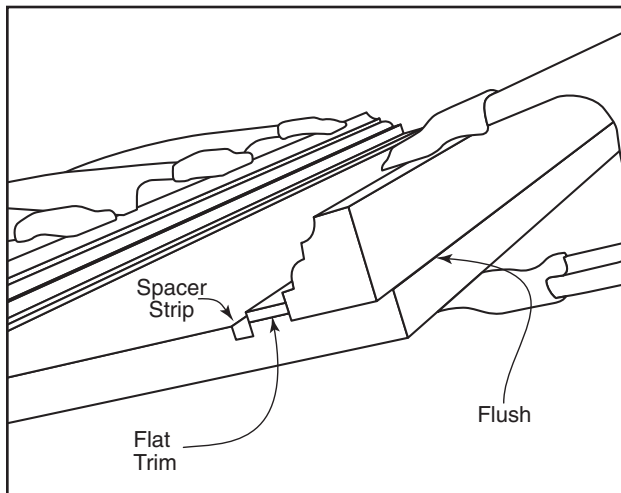
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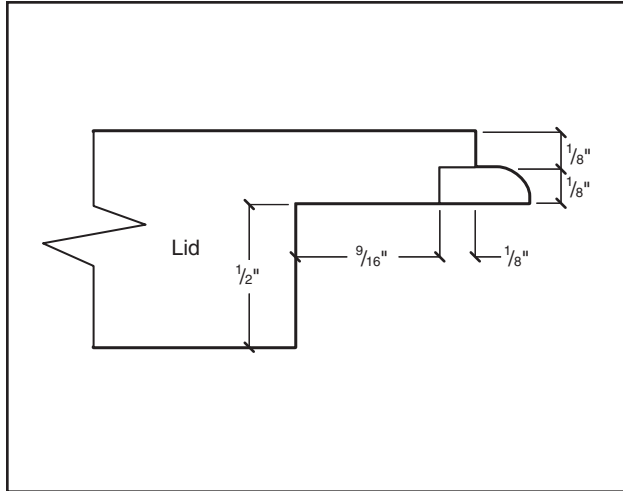
**FIG 2. GLUE AND CLAMP THE FLAT TRIM**



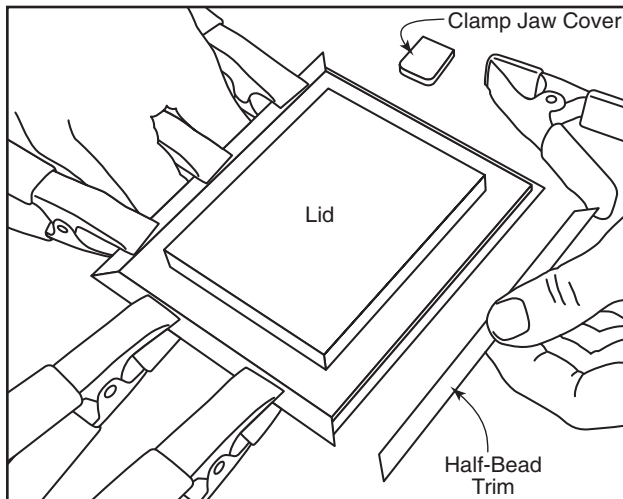
**FIG 3. GLUE AND CLAMP THE MOLDING**



**FIG 4. BOTTOM LID DETAIL**



**FIG 6. GLUE THE HALF-BEAD TRIM**



**FIG 5. CUTTING SEQUENCE FOR THE HALF-BEAD TRIM**

