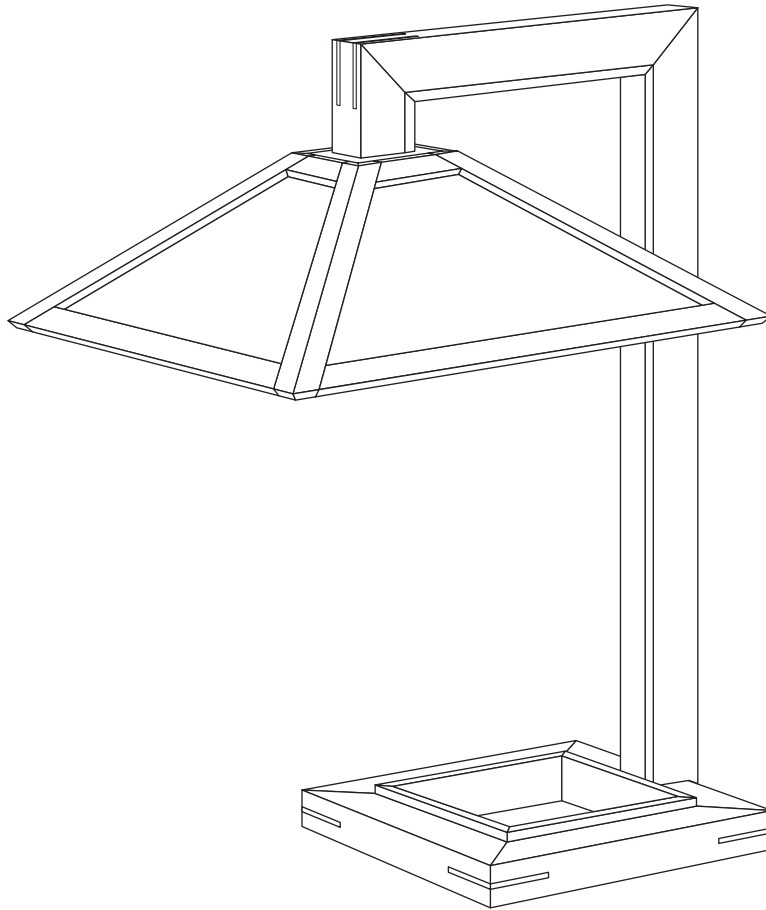




WOODWORKS: ADVANCED PROJECT 2006-2007
ARTS & CRAFTS TABLE LAMP



With its simple lines, this lamp is reminiscent of early 20th-century Prairie-style design, but beneath its seemingly straightforward lines lies a challenging project for advanced woodworkers that demands precision in cutting angles and making exposed joints, especially for the shade. As you'll see, however, using jigs and special tablesaw setups will help to simplify even the trickiest steps. When you've done all the woodworking, you'll probably find the wiring a breeze, even if you haven't done much before. You'll also learn more about applying and using stains and finishes to protect the wood and keep it looking beautiful through the course of building this project.

TOOLS REQUIRED

Power Tools

- Tablesaw with rip/crosscut blade and dado blade
- Router with 1/4" router guide bushing and 1/4" straight cutting bit
- Jigsaw

Miscellaneous

- Pencil
- Tape measure
- Felt-tipped marker
- Safety glasses
- Carpenter's glue
- 120, 150 and 220-grit sandpaper
- Clean, lint-free cloths
- Respirator
- Double-sided tape

- 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 waste materials)
- Minwax® Wood Finish™ Stain Brush or other good quality, natural-bristle brush (for oil-based stains and finishes)

SHOPPING LIST

Item	Quantity
8/4 cherry	3 bd. ft.
4/4 cherry	3 bd. ft.
Electrical parts, see below	
Stained glass, see below	

CUTTING LIST

Overall Dimensions: 22-1/2"H x 41-1/2"W x 17"D			
Key	Part	Pcs.	Dimensions
A	Base sides	4	1-1/8" x 1-1/2" x 9-1/4"
B	Base lip	4	5/16" x 1-3/8" x 6-5/16"
C	Arm (vertical)	1	1-1/2" x 1-1/2" x 22-1/2"
D	Arm (horizontal)	1	1-1/2" x 1-1/2" x 10-3/4"
E	Arm (end)	1	1-1/2" x 1-1/2" x 3"
F	Vertical cover plate	1	7/16" x 1-1/8" x 21"
G	Upper cover plate	1	7/16" x 1-1/8" x 9"
H	End cover plate	1	7/16" x 1-1/8" x 2"
J	Shade hangers	2	3/8" x 2-1/2" x 2-1/2"
K	Shade sides	8	3/4" x 1" x 10-1/2"
L	Shade tops	4	3/4" x 1" x 12"
M	Shade bottoms	4	3/4" x 1" x 15-1/2"
N	Splines	8	1/8" x 2" x 3-1/2"

Recommended Wood: Cherry

Alternate Wood: Mahogany

WOOD FINISHING PRODUCTS

Recommended Finish

- Prep: Minwax® Pre-Stain Wood Conditioner (if using soft or porous wood)
- Stain: Minwax® Gel Stain Cherry (or your choice of any of the 8 Minwax® Gel Stain colors)
- Finish: Minwax® Fast-Drying Polyurethane Semi-Gloss

MATERIAL LIST

Glass

Key	Part	Pcs.	Dimensions
P	Stained glass	4	1/8" x 12-1/4" x 6-1/8"

Electrical

Key	Part	Pcs.	Dimensions
Q	Lamp cord and plug	1	18 g. 8 ft. long
R	Rotary line switch	1	
S	Bushing	1	1/8" ips, female bushing
T	Steel pipes	2	1/8" ips, 10" long
U	Couplings	3	1/8" ips, female
V	Steel pipe	1	1/8" ips, 9" long
W	Armbands (elbows)	2	90 degree, 1/2" ball, 1/8 ips
X	Nipple	1	1/8" ips, 5" long
Y	Star lock washers	2	1/8" ips
Z	Nuts	3	1/8" hex nut
AA	Keyless sockets	2	
BB	Cluster body	1	1-1/16" x 1-1/16"
CC	Brass arms	2	3-1/2", 1/8" ips
DD	Wire nuts	2	9/16" x 5/16"

Alternate Finish

- Prep: Minwax® Pre-Stain Wood Conditioner (if using soft or porous wood)
- Stain: Minwax® Wood Finish™ Golden Oak Stain (or your choice of any of the 22 Minwax® Wood Finish™ Stain colors)
- Finish: Minwax® Fast-Drying Polyurethane Satin (Also available in aerosol)

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

Build the Shade Frame

The shade is made of four identical frames. Use a stop block for all the cuts to ensure repeat accuracy.

1. Mill the 4/4 cherry board to the design thickness and rip the boards into 1" widths. Rough-cut three 12" pieces and one 18" piece for each of the four frames (K, L, M, Fig. 1). Cut enough parts to build an extra frame as a precaution and for setup purposes.

2. Attach a long auxiliary fence to your tablesaw's miter gauge. Consider adding an acrylic guard just as a reminder of where not to put your fingers.

3. Make a setup block for setting your miter gauge angles by cutting a 38-degree angle on one end and a 26-degree angle on the other. Use an accurate miter saw to cut the block.

4. Set the miter gauge to cut at 38 degrees. Miter both ends of the frame sides (K) and frame bottoms (M) to final dimensions. Miter just the left edge of the frame top (L). All these cuts can be made using one miter fence setting.

5. Cut the half-lap joint on the mitered end of each piece (Figs. 2 & 3). Use scrap wood to set the blade height and a stop block for each cut. You will need to rotate the miter gauge 38 degrees right and left of center to accomplish all the angles.

6. Dry-fit all the pieces together and mark the position of the half-lap on the right side of the frame top (Fig. 4) to determine the exact position of the top's second dado. Then cut the rest of the top half-laps.

Woodworker's Tip: *This piece is actually quite short in the finished shade, but it's much easier to make and hold on the saw if you start with a long piece of wood. Trim the excess length after the frame has been glued up.*

7. Glue each frame assembly together with small C-clamps. When the glue has set, cut off the waste on the top.

Rabbet for the Glass

8. Make a template out of 1/4" plywood to cut rabbets in each frame. Simply place a shade frame on the plywood, trace the interior and

mark lines 1/4" to the outside of the tracing lines. Cut to this line with a jigsaw. Keep the template 3" wide to support the router.

9. Rout the rabbet with a 1/4" straight bit and guide bushing (Figs. 3 & 5). Take several passes of to get the rabbet to full depth. Clean up the corners of the rabbet using a chisel.

Woodworker's Tip: *Use double-sided tape to secure the frame to the bench and template. Tuck frame scraps under the template for support.*

Cut the Compound Miters

10. Use the setup block to set the tablesaw miter fence to cut at 38 degrees and angle the blade to 26 degrees.

11. Place a frame, face side up, with the bottom against the fence. Cut the compound miter (Fig. 6), leaving a 5/8"-wide side (Fig. 3).

Woodworker's Tip: *To ensure a clean joint, make two passes. The first cut is just shy of the line. For the second cut, add a shim, such as a playing card, to the stop block. This will take just a whisker off for a super-clean edge.*

12. Next, place the freshly cut side against the miter fence and adjust the angle so the uncut side is parallel to the blade. This should be approximately 76 degrees on the miter gauge. Then miter the second side.

13. With a beveled side against the fence, adjust the miter fence so the frame bottom is parallel to the blade. Reset the blade to 90 degrees; rip each bottom to 3/4"-wide (Fig. 7A). Reset the blade to 45 degrees and bevel the underside of the frame's bottom just up to the routed rabbets (Fig. 7B).

14. Remove the miter fence, flip the frame over onto its face and use the tablesaw fence to bevel the top (Fig. 7A). Leave a 3/8"-wide flat reveal at the top. The shade hanger (J) sits inside this reveal. Place the frame bottom against the tablesaw fence and rip each frame top at 90 degrees so each frame is identical.

15. Glue the four frames together using spring clamps. When dry, clean up the glue and sand.

Cut the Glass and Shade Hangers

16. Make a cardboard template 1/32" smaller than the frame opening. Mark this pattern on the glass using a felt-tipped marker.

17. Make a single scoring cut just inside one of the lines. Place the scored edge over the end of the bench and, with a gentle downward motion, snap the glass at the scored mark. Repeat until all the glass is cut. Be sure to wear gloves for this step. Freshly cut glass can be razor sharp.

Woodworker's Tip: *Minor adjustments to the glass shape can be made using an 800-grit waterstone. Do not use a grinder or power sander.*

18. Cut the two shade hangers (J, Fig. 8). Make a simple crosscut jig (Fig. 9) to safely cut the 45-degree chamfers on the tablesaw. Trim the top hanger until it just fits inside the mitered top of the shade and

flush with the top reveal. Drill a hole in the center of each hanger for the nipple (X).

Make the Base and Arm

19. Mill 8/4 cherry to 1-1/2". Rip stock for the four base sides (A) to 1-1/8". Miter to the final dimension.

20. Glue up the base with a band clamp. After the glue dries, cut slots for the splines (N) on the tablesaw (Fig. 10) using a shop-made spline slot sled (Fig. 11). Glue in the splines and trim them flush when dry. Cut the reveal around the bottom of the base (Fig. 1).

21. Cut a notch in the back of the base (Fig. 1) with a dado blade.

22. Mill 4/4 cherry to 5/16"-thick stock and rip to 1-3/8" wide for base lip (B). Miter to fit inside the base, and glue.

23. Cut a 45" length of 1-1/2" x 1-1/2" cherry for arm assembly parts (C, D and E).

24. Cut a deep groove for the conduit in the center of one edge (Fig. 1).

25. Miter the arm assembly parts. To make clamping the miter easier, leave part E long until after the glue-up.

26. Cut the notch in the bottom of Part C (Fig. 1). Dry-fit the base and the vertical arm.

27. Drill two holes (Fig. 1, Detail. 2) for the screws that attach the base and arm. Drill a third hole for the lamp wire.

28. Glue the arm assembly one joint at a time. Leave the end piece extra-long for now, so there's room to attach the stepped block. Cut this piece to length after it's glued.

29. Cut the spline slots in the assembled upright, as in Step 20, and glue in the splines. Cut the spines and sand them flush.

30. Cut arm end (E) to final length.

31. Make cover plate F, G and H (Fig. 1, Detail 1) from a 40"-long strip of wood. Cut the rabbets so the cover plates fit snugly into the groove with hand pressure.

32. Miter the completed cover plates to fit the upright.

33. Sand the shade, base, upright and hangers to 220-grit and apply the finish. Refer to the STAINING & FINISHING section.

34. Install the stained glass in the shade. To hold the glass in place, rip 3/16" x 3/16" cherry stops on the tablesaw. Miter the stops to fit behind the glass and attach them with No. 19 x 1/2" brads (Fig. 7B).

NOTE: Install the glass after you stain and finish the shade.

Assemble the Wiring Conduit

We've wired this lamp the safest way possible using metal conduit to protect the wires. The lamp cord has a polarized plug for safety and an add-on power switch for simplicity.

35. Cut two 10" pieces from the end of lamp cord (Q) and set aside for wiring the sockets later.

36. Feed the lamp cord through the hole in the upright. Assembling the conduit is just a matter of screwing Parts S through X together and feeding the wire as you go (Fig. 12). Don't overly tighten the two armbacks (W) as they can cut through the cord insulation. Make sure several inches of cord feed past the end of the nipple (X).

Woodworker's Tip: Reverse twist the cord before screwing on the last armback so the wire is not wound in the conduit.

37. Lay the conduit into the upright base/arm assembly.

Complete the Wiring

38. Screw the two arms (CC, Fig. 13) into the cluster (BB).

IMPORTANT: Make sure the wire nuts are rated to join three 18-gauge wires.

39. Feed 10" of lamp cord from the cluster through each arm.

40. Wire the sockets (AA, Fig. 14). Strip 5/8" of insulation from each wire end and wrap the bare wire three-quarters of the way around the screw.

41. It's standard practice in lamp wiring that the neutral wire is marked. Our wire was marked with ribbing on the insulation. Other manufacturers may use different colored insulation or a colored strand in the wire itself. No matter how it's marked, you can always tell the neutral wire; it's the one that comes off the wide blade on the plug.

42. Attach the rotary switch (R) to the cord (Fig. 15). Cut the hot wire, lay both wires through the switch, snap on the cover and screw it down. Small metal prongs penetrate the insulation and complete the switch circuit.

43. Attach the shade to the upright (Fig. 16).

44. Twist wire nuts on the three neutral wires and the three hot wires (DD, Fig. 13). Take care that all the copper wire strands are in the wire nuts. Push the wires into the cluster and screw on the cap.

FINAL ASSEMBLY

Attach the Base

45. Screw the base onto the uprights. Check with a square to make sure the arm seats 90 degrees to the tabletop. If needed, pare the base slot with a chisel to adjust the fit. Plug the screw holes with 3/8" cherry plugs and sand them flush. After you stain and finish add self-adhesive felt pads to the bottom and you're done!

Attach the Shade

46. See Fig. 16. Screw the hex nut onto the nipple until it's just below the surface of the arm. Install the cover plates.

47. Screw the upper shade hanger to the arm. To determine where to place the screw holes, fit the upper shade hanger upside down over the conduit. Draw the outline of the arm end onto the hanger. Remove the

hanger, and countersink and drill three holes for the screws. Drill pilot holes into the arm end to prevent splitting.

48. Set the shade on the upper shade hanger and place the lower hanger over the nipple. Tighten nut A and its washer onto the threaded conduit. Install nut B and washer about halfway down the nipple. Thread the lamp socket cluster onto the nipple. Stop when the nipple reaches just inside the cluster. Back off nut B to lock the socket cluster in place.

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, must be cleaned with soap and water; oil-based finishes must be cleaned with mineral spirits.

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

Recommended Finish

50. Prior to final assembly of the lamp, apply the Minwax® Gel Stain you've chosen to the surfaces using a clean, lint-free cloth or natural-bristle brush. Allow the Gel Stain to set for about 3 minutes, then wipe off any excess. Repeat for the exterior surfaces. To achieve a deeper color, you may apply a second coat after 8 to 10 hours, repeating the application directions for the first coat. Allow the stain to dry for 24 hours before applying the 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.*

51. 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.

52. The next day, sand all surfaces lightly with 220-grit or finer sandpaper using with-the-grain strokes. Dust off and 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.

53. The following day, sand all surfaces lightly with 220-grit paper. Dust off and wipe the piece with a cloth lightly dampened with mineral spirits and apply the third and final coat of polyurethane.

Alternate Finish

54. Apply the Minwax® Wood Finish™ you've chosen to the 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.

55. 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.

56. The next day, sand all surfaces lightly with 220-grit or finer sandpaper using with-the-grain strokes. Dust off and 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.

57. The following day, sand all surfaces lightly with 220-grit paper. Dust off and wipe the piece with a cloth lightly dampened with mineral spirits and apply the third and final coat of polyurethane.

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.

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.

DANGER: Rags, steel wool, other waste soaked with oil-based stains and clear finishes, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with these products, and sanding residue in a sealed, water-filled metal container. Dispose of in accordance with local fire regulations.

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 over-exposure, 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.

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 chemicals 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. CONFORMS TO ASTM D-4326. Contact a physician for more health information.

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: This product contains chemicals 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. CONFORMS TO ASTM D-4326. Contact a physician for more health information.

SOURCES

Grand Brass Lamp Parts

(212) 226-2567

www.grandbrass.com

One 10-ft. 18/2 SPT-1 cord with molded plug, #WIC10FTBL, \$1.50

One black rotary line switch for SPT-1 cord, #SW423BL, \$0.80

One 1/8 ips female black bushing, #BG201B, \$0.10

Two 10" x 1/8 ips steel pipe, #PIST10, \$0.75 ea.

One 9" x 1/8 ips steel pipe, #PIST09, \$0.75

Three straight coupling brass 1/8F thru, #NE449, \$0.20 ea.

Two 1/8m bottom x 1/8f side,

1/2 ball 90-degree armback, #AB335NP \$0.75 ea.

One 5" x 1/8 ips nipple steel, #N15-0X1/8, \$0.60

Two 1/8 ips slip star lock washer, #WA1/8STAR, \$0.02 ea.

Three 1/8 hex nut, brass, #NU424, \$0.08 ea.

Two 3-1/2" plain (J) arm brass 1/8m ips, #ARJL, \$2.25 ea.

One small turned cluster body,

2-piece, #BOS2XB, \$2.50

Two MD wire nut, #WINUTG, \$0.10

Two cast-brass uno-threaded keyless socket with 1/8 ips bushing and setscrew, #SO9347CB, \$10 ea.

Processing fee for order under \$50: \$10.

Total cost: Lamp electrical parts, \$50 plus shipping.

Southern Front Stained Glass

(281) 890-5860

www.southernfront.com

Wissmach Glass, W0101, Dark Green and Opal Wispy

Five 10-1/2" x 16" panels, \$27

Fletcher-Terry steel glass cutter, \$4.50.

Woodworkers Supply

(800) 645-9292

www.woodworker.com

Felt discs, #933-671, \$2.99 strip of 60

1/4" straight bit, #03-140, \$13.99

1/4" router guide bushing, #938-048, \$7.99

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**AMERICAN
WOODWORKER.**

FIG 1. LAMP DETAILS

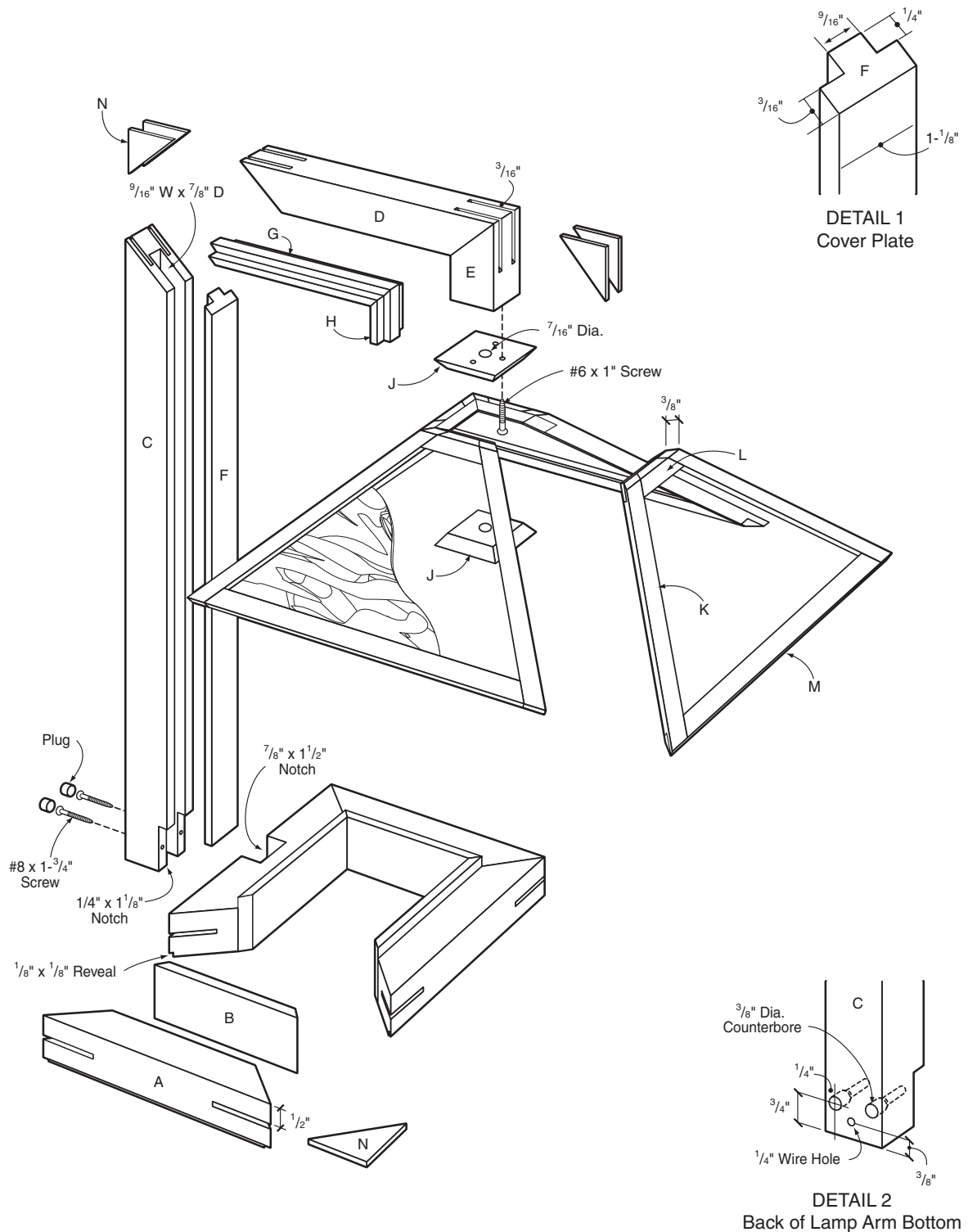


FIG 2. CUT THE ANGLED HALF-LAP JOINTS

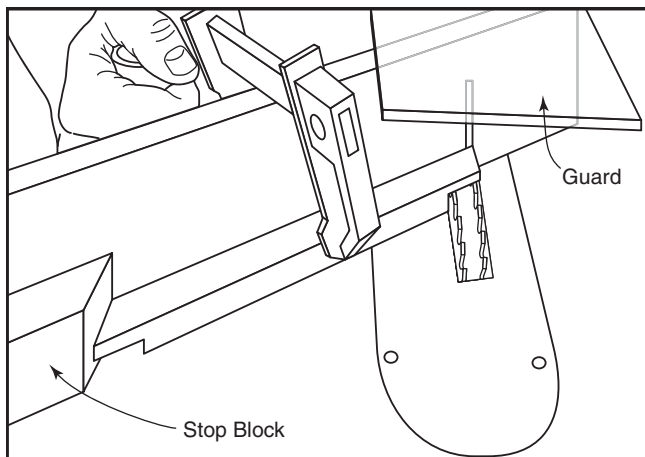


FIG 3. HALF-LAP JOINTS

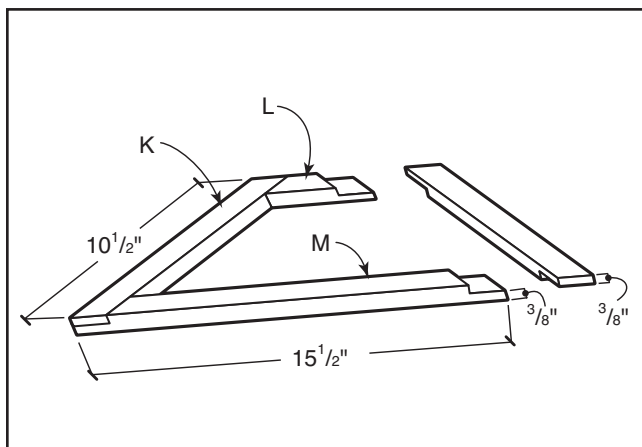


FIG 4. ASSEMBLE THE FRAME

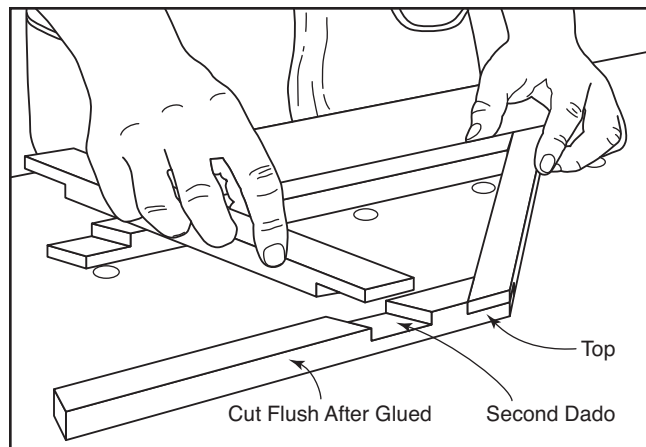


FIG 5. RABBET EACH FRAME

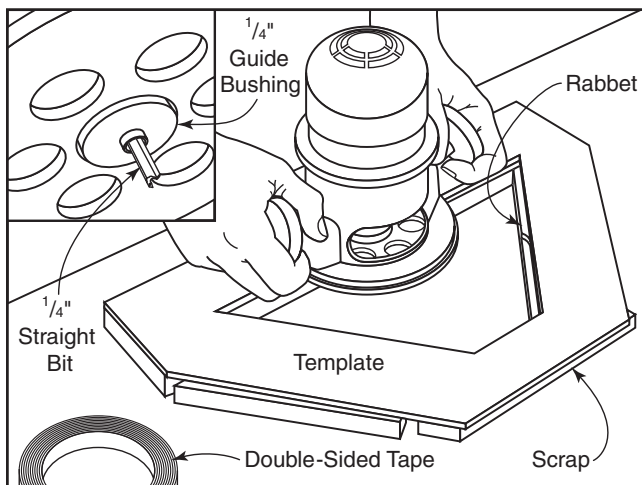


FIG 6. RIP THE COMPOUND ANGLES

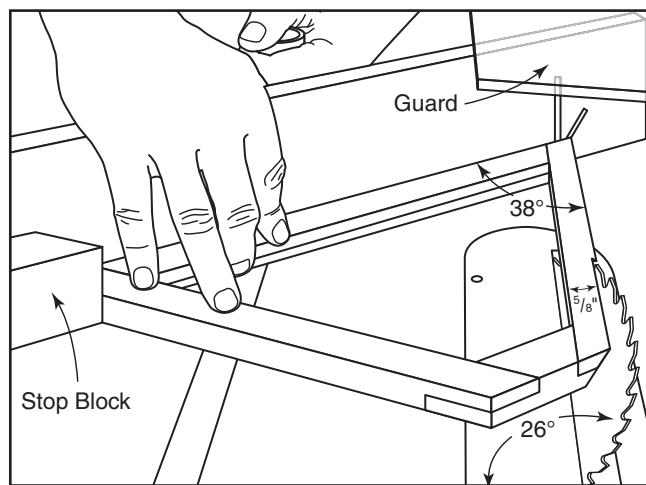


FIG 7A. BEVELED ENDS

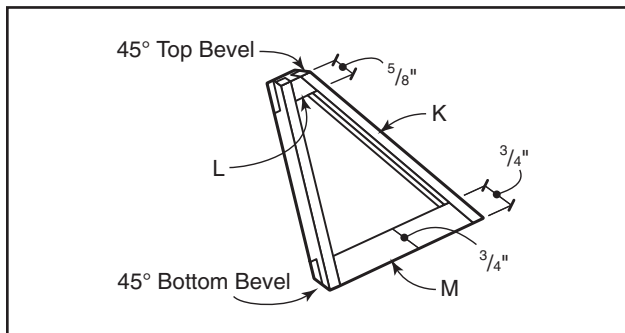


FIG 7B. INSIDE OF SHADE FRAME

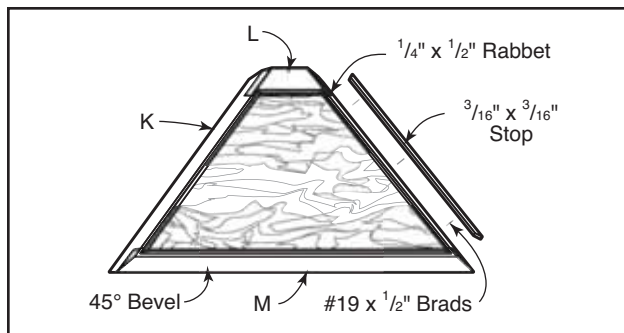


FIG 8. CUT THE SHADE HANGERS

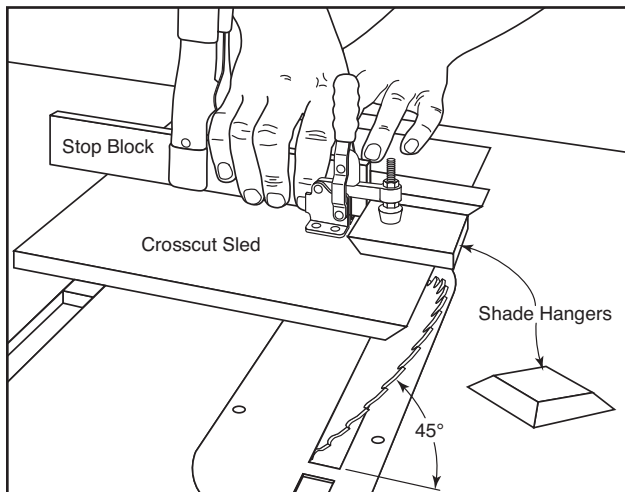


FIG 9. CROSSCUT SLED

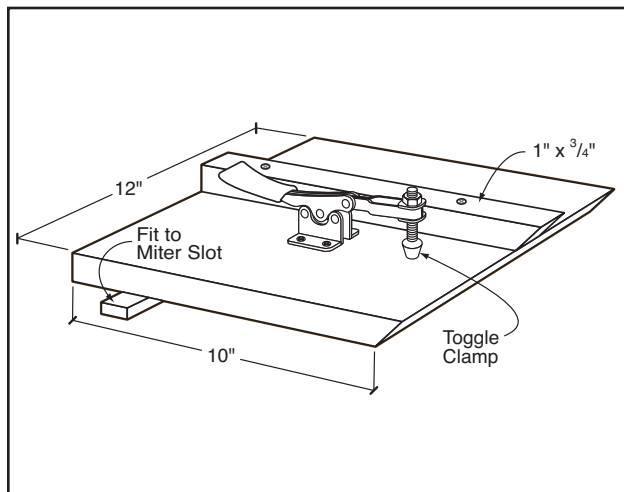


FIG 10. CUT SLOTS FOR SPLINES

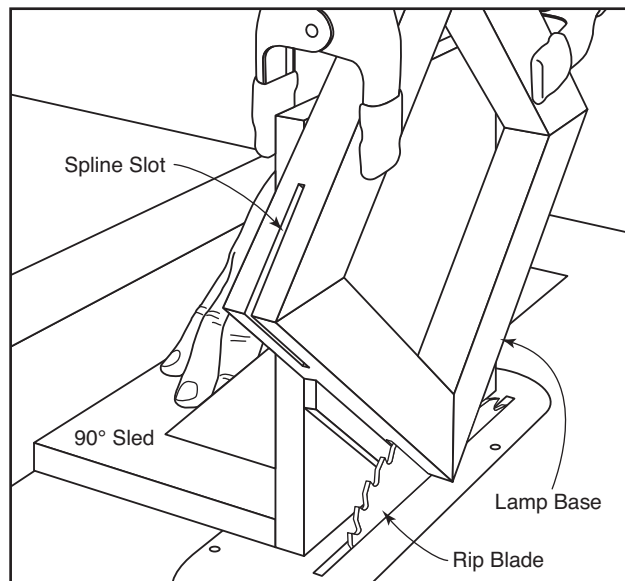


FIG 11. SPLINE SLOT SLED

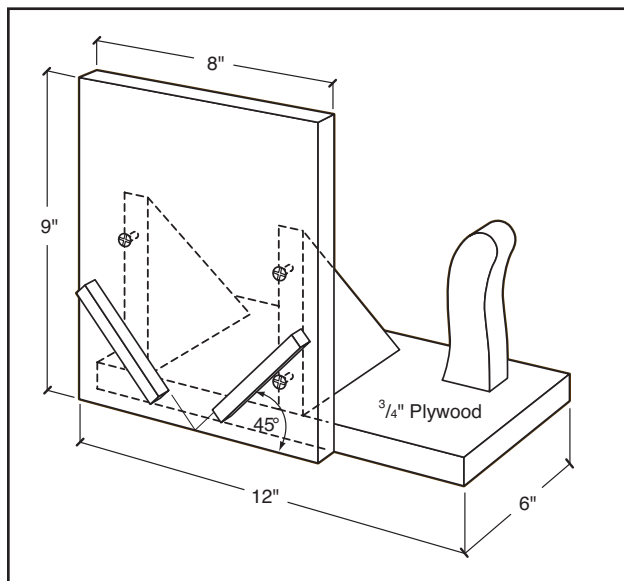


FIG 12. CONDUIT ASSEMBLY

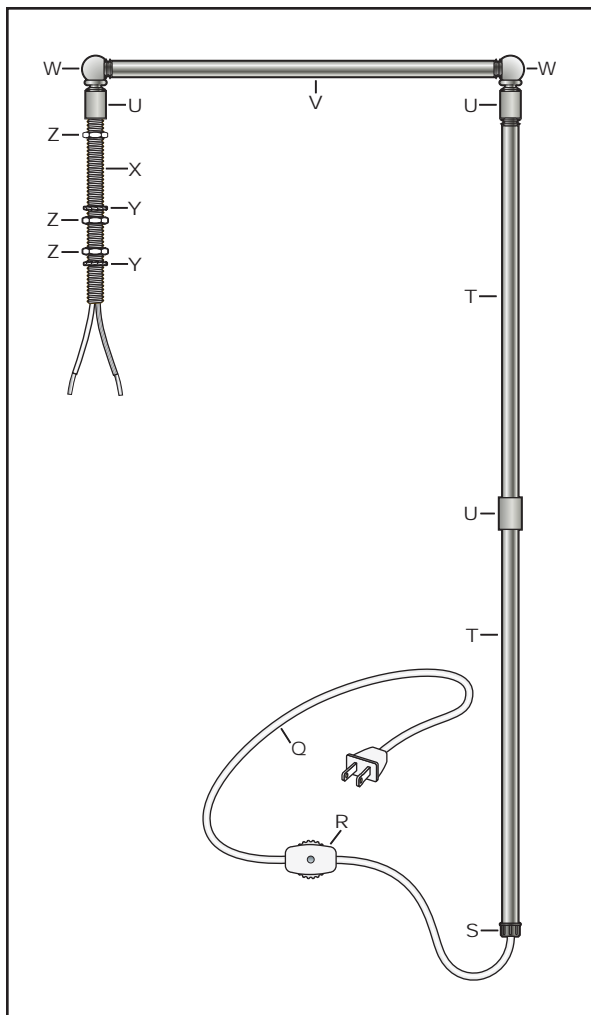


FIG 13. CLUSTER WIRING

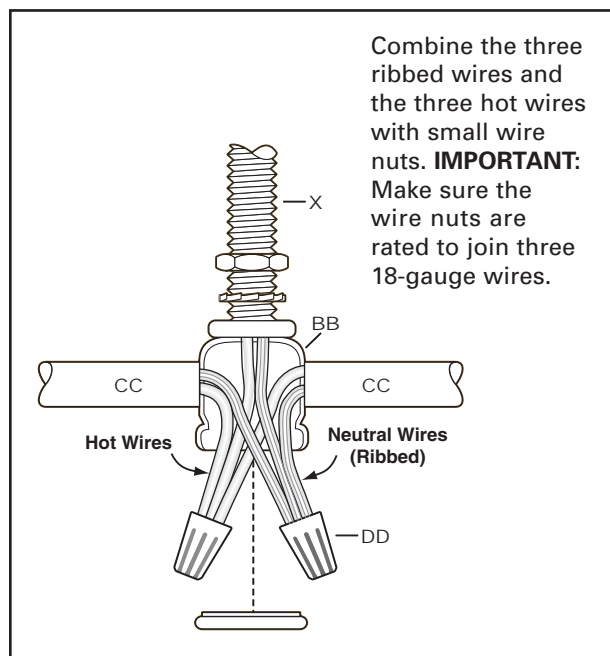


FIG 14. SOCKET ASSEMBLY

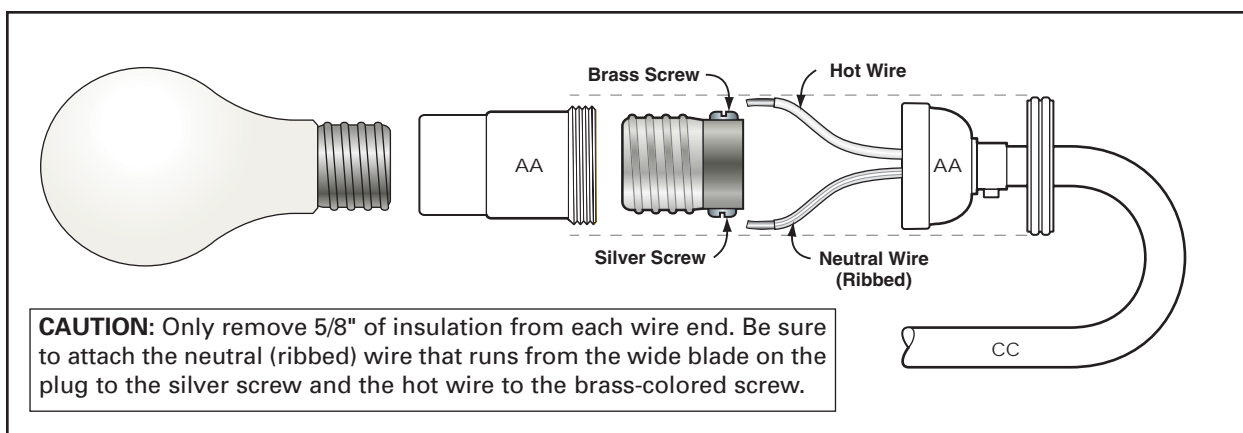


FIG 15. ROTARY SWITCH

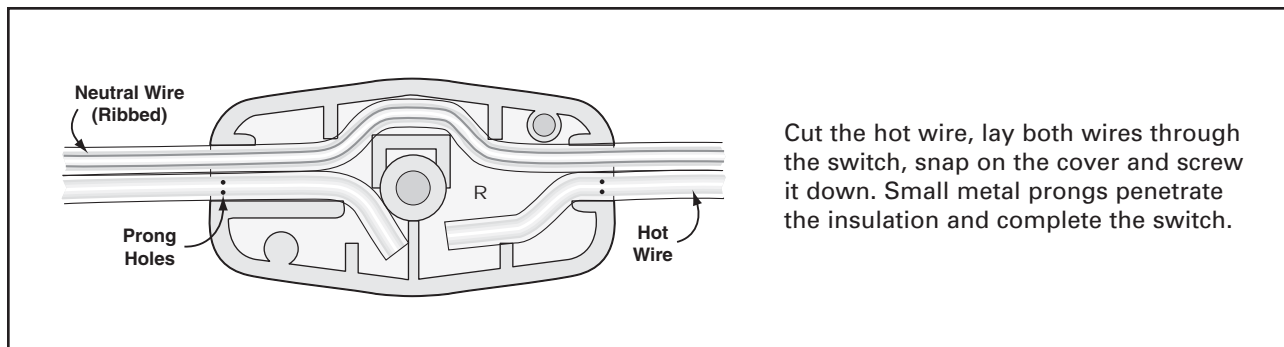


FIG 16. ATTACH THE SHADE

