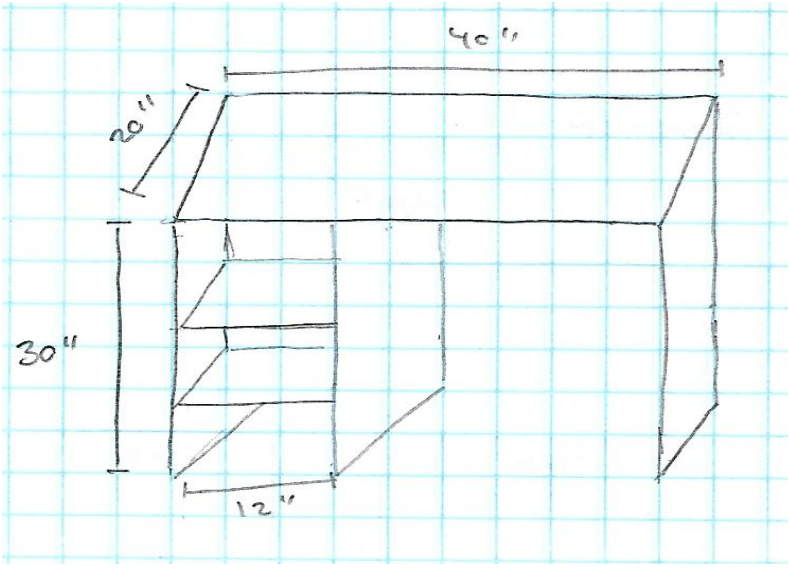
How to Build an Inexpensive Desk out of 3/4" Plywood



Introduction:
In the following instructions, you will learn how to build an inexpensive desk made of one ¾" x 4' x 8 ' sheet of cabinet-grade plywood. The desk dimensions are 30" x 40" x 20". The desk has two shelves for storage and has a large desktop. The instructions are intended for adults with basic knowledge of woodworking techniques and a basic knowledge of how to use power-tools (e.g. a circular saw and an electric drill).

The instructions demonstrate how to cut the plywood, how to assemble the desk, and how to apply a protective finish to the desk. However, these instructions do not show how to do advanced joinery techniques like dovetails or how to use expensive specialty power-tools like a table saw. Lastly, building this desk is a two day project because of the drying times of each coat of the protectant. Day one is cutting the desk pieces, assembling, and applying the first coat of protectant. Day two is for applying the second coat of protectant.

Materials:
(1) Sheet of ¾" x 4' x 8' cabinet-grade plywood

(16) 2” Phillips head wood screws
(1) Sheet of 120 grit sandpaper
(1) Sheet of 220 grit sandpaper

Required Tools:
(1) Pencil
(1) Carpenter’s square
(1) Tape measure
(1) 8-foot long straight-edge (e.g. a 2 x 4 or a ruler)
(1) Black permanent marker
(1) 10” circular saw
(1) Electric drill
(1) ⅛” Drill bit
(1) Phillips head bit
(4) 36” Adjustable clamps

Finish and Protectant Supplies:
(1) 3.25 oz Tube of stainable wood filler
(1) 2” Painter’s putty knife (plastic or metal)
(1) 2” Foam paint brush
(1) Quart of Minwax Polycrylic in satin finish
(2) Cotton tack cloths (optional: an old white cotton t-shirt)

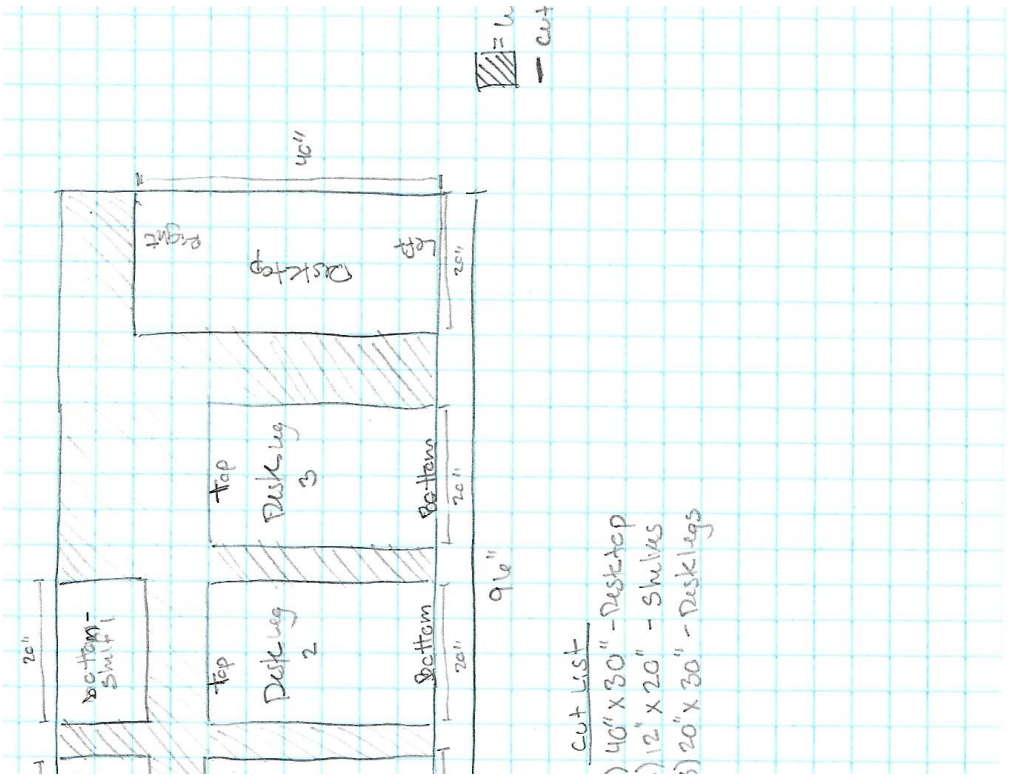
Warnings:
1.Follow all the safety instructions that are included with your power tools to prevent bodily injury.

2. Wear Personal Protective Equipment (P.P.E) like safety glasses, hearing protection, and a dust mask.

3. Properly dispose of paint brushes and tack cloths, and other materials used in the application of Minwax Polycrylic following the manufacturer's instructions.

1.To label desk pieces and cut the plywood, perform the following steps:

A. Use a pencil, tape measure, and straight-edge to draw the cutlines in the plywood sheet. Use the provided “Cut List Layout” for the dimensions and orientation of each of the desk parts on the plywood.



B. Use the provided “Cut List Layout” to label each piece of the desk. Labeling the desk pieces early in the process makes the following steps easier to accomplish.

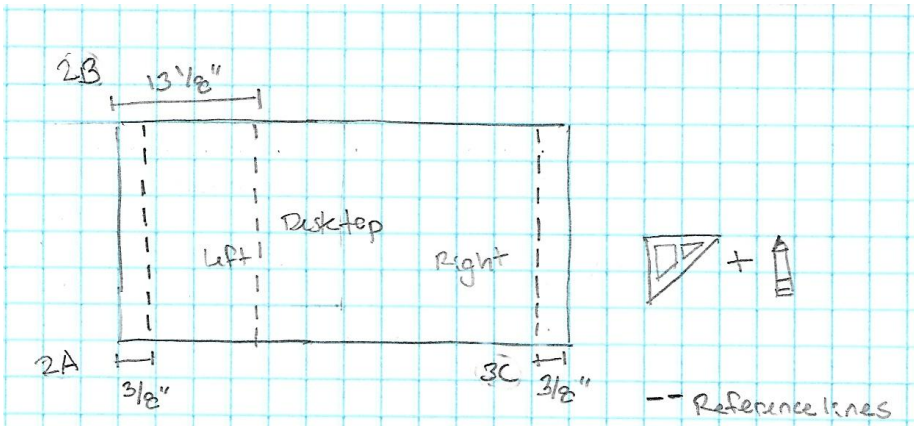
C. Following the cutlines, use a circular saw to cut the plywood.

D.Use one sheet of 120 grit sandpaper and sand the cut edges to remove any splinters on the plywood pieces.

2.To create reference lines on the desk pieces, perform the following steps:

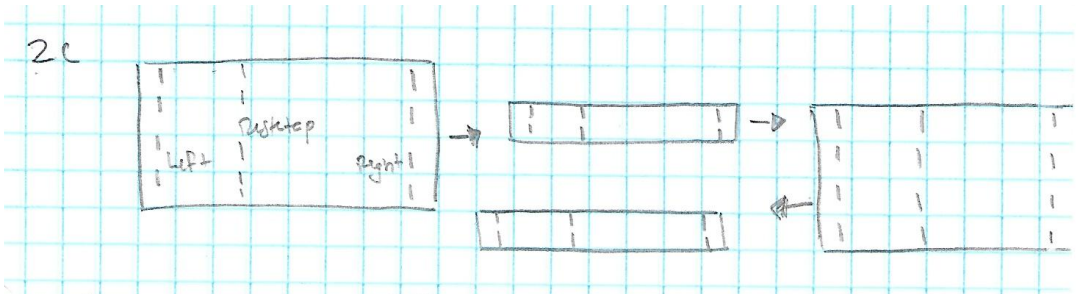
A.On the piece labeled desktop, use a pencil and carpenter’s square to draw a straight line ⅜” from the left edge of the desktop. Repeat the same step for the right edge of the desktop.

B. Use a pencil and a carpenter’s square to draw a straight line 13 ⅛” from the left edge of the desktop.



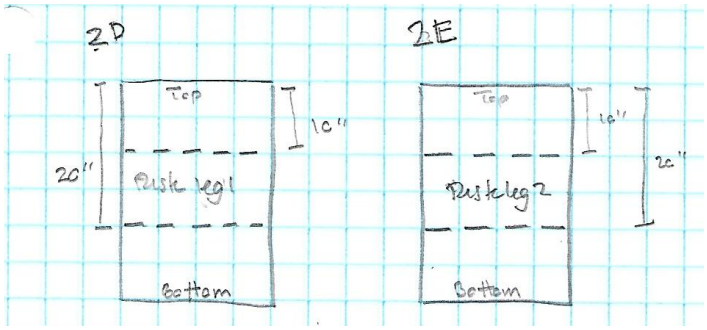
Note: On a piece of plywood, when one side is wider than the other, the wider side is called the face grain or face. The narrower side of the plywood which shows the individual grains is called the edge grain or edge.

C.Continue the reference lines from steps A and B through the two faces and the two edge grains of the desktop as shown in Figure 2C. You should see three reference lines, two reference lines on the left side of the desktop and one reference line on the right side of the desktop.



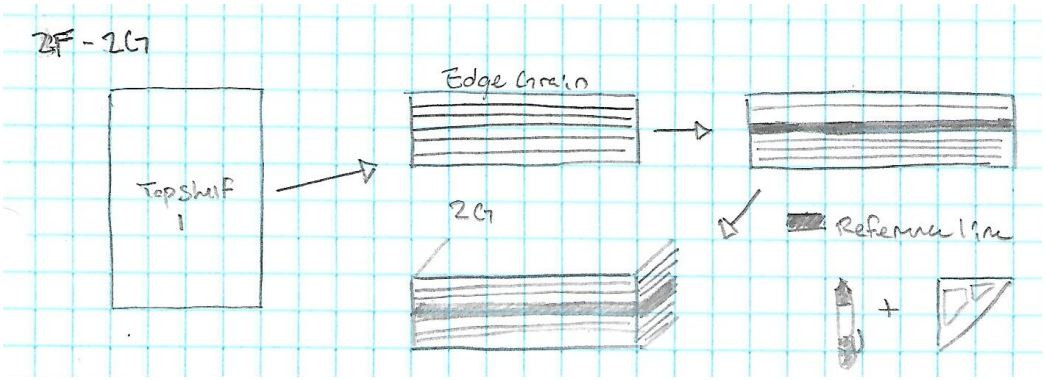
D.On Table Leg 1, draw a straight line 10” and 20” from the end of the plywood labeled “top”. Continue both lines through the two faces and two edges of the plywood.

E. Repeat step C for Table Leg 2. Continue both lines through the two faces and two edges of the plywood.



F. Grab Top Shelf 1 and orient it so that you see the individual layers that make up the plywood, which is called the edge grain. Use a permanent marker and a carpenter's square to draw a straight line in the middle of the edge-grain. The marker line should cover the middle layer of the edge grain in black ink.

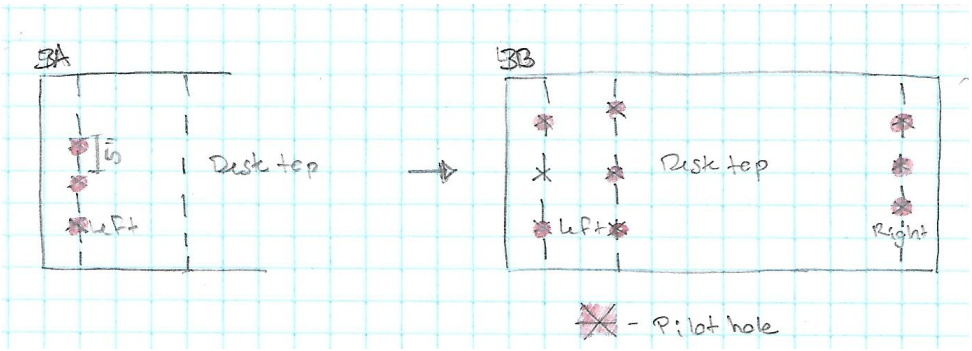
G.Continue the reference line in step F on all four edges of the edge grain in Top Shelf 1. Repeat step F for Bottom Shelf 1.



3. To drill pilot holes on the desk, perform the following steps:

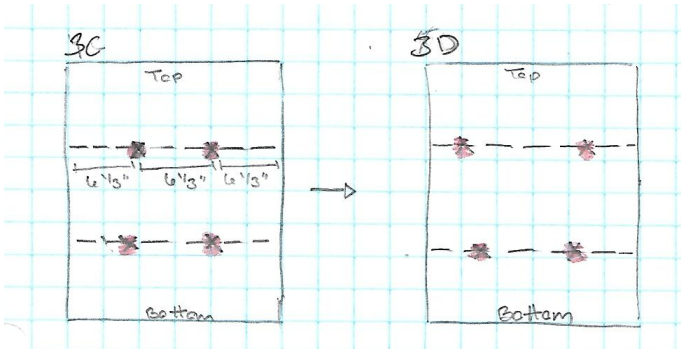
A.Following the leftmost reference line on the left side of the Desktop, mark an "X" every 5".

B. Repeat step A on the remaining reference lines on the Desktop.



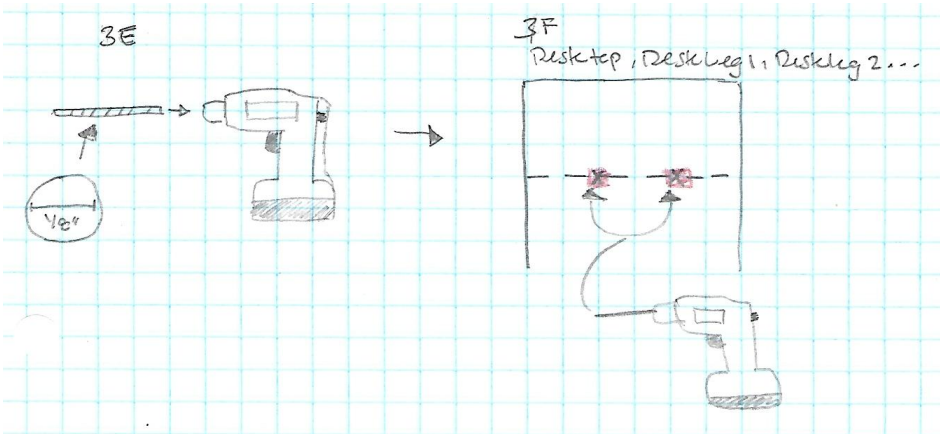
C. Mark an “X” every 6 ⅓” on the reference lines marked on Desk Leg 1.

D. Repeat step C on Desk Leg 2.



E. Attach a ⅛“ drill bit to your electric drill.

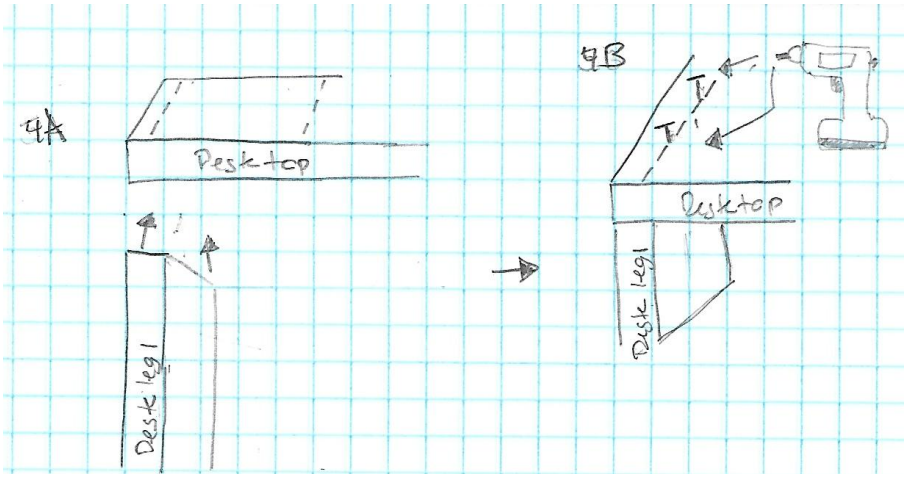
F. Drill a ⅛” diameter hole in the center of every X mark on the Desktop, Desk Leg 1, and Desk Leg 2. Drilling the pilot holes makes assembling the desk pieces easier and lowers the risk of splitting the plywood ends.



4.To assemble the desk, perform the following steps:

A. Align Table Leg 1 perpendicular to the left edge of the Desktop. Both pieces should form an “L” shape. Use two 36” adjustable clamps to keep the “L” Shape.

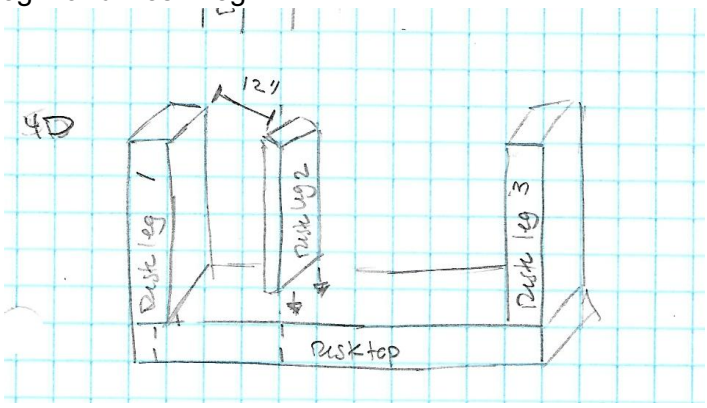
B.Place one 2” wood screw in each of the pilot holes in the reference line closests to the left edge of the Desktop. Use an electric drill with a Phillips head attachment to connect the Desktop to Desk Leg 1 by screwing the wood screws through the two pieces of plywood.



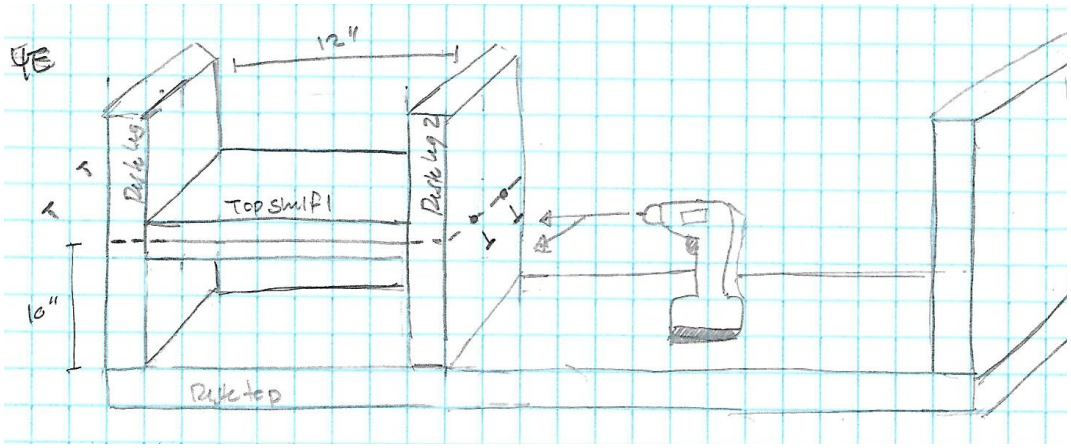
C. Align Desk Leg 3 with the right edge of the Desktop. Both pieces should mirror the “L” shape image in step A. Repeat step B to connect the Desktop to Desk Leg 3.

D.Align Desk Leg 2 perpendicular with the Desktop. There must be a 12” distance between Desk Leg 1 and Desk Leg 2. Repeat step B, but this time, place the wood screws into the pilot holes that are 13 ⅛” from the left edge.

Tip: Use adjustable clamps and either Top-Shelf 1 or Bottom Shelf 1 as a spacers to maintain a 12” gap between Desk Leg 1 and Desk Leg 2.

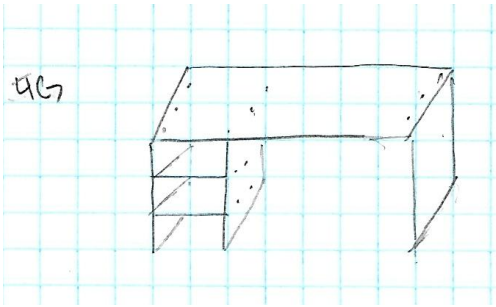


E. Align Top Shelf 1 in between Desk Leg 1 and Desk Leg 2. The top reference lines on the Desk Leg 1 and Desk Leg 2 should align with the reference line on the edge grain of Desk Shelf 1.



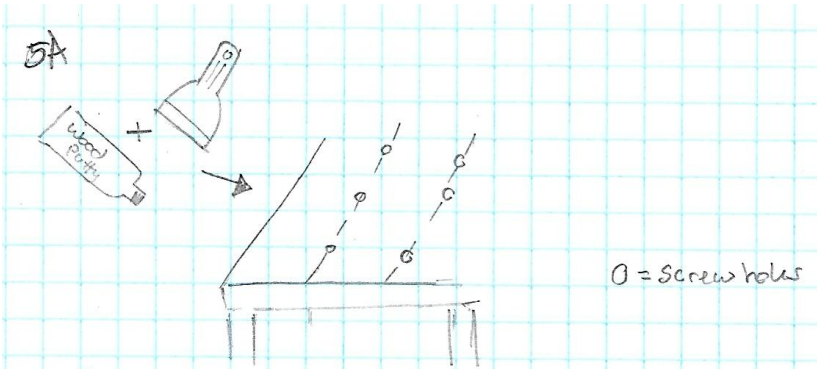
F. Place wood screws into the corresponding pilot holes. Use an electric drill to connect Top Shelf 1 with Desk Leg 1 and Desk Leg 2.

G. Repeat steps E and F for the Bottom Shelf 1. The complete non-protected desk should look like Figure 4G.



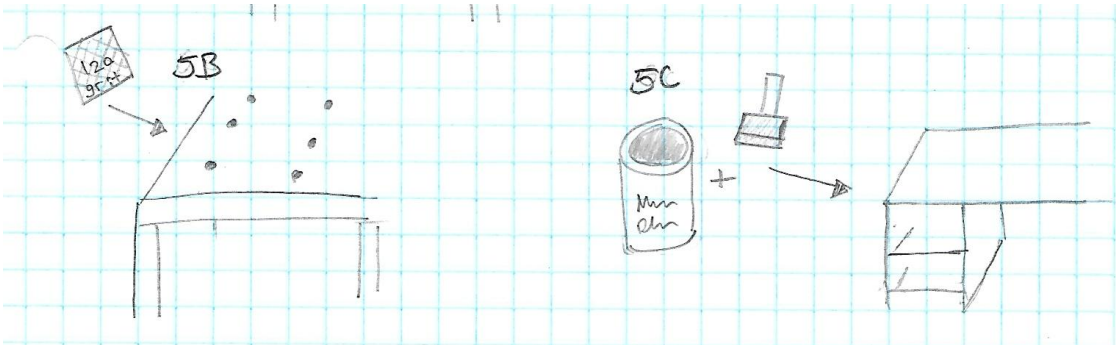
5. To apply a protective finish on the desk, perform the following steps:

A.Use a 2” putty knife to apply a layer of wood putty to the exposed screw-heads and visible scratches in the plywood. Let the wood putty dry for 3 hours.



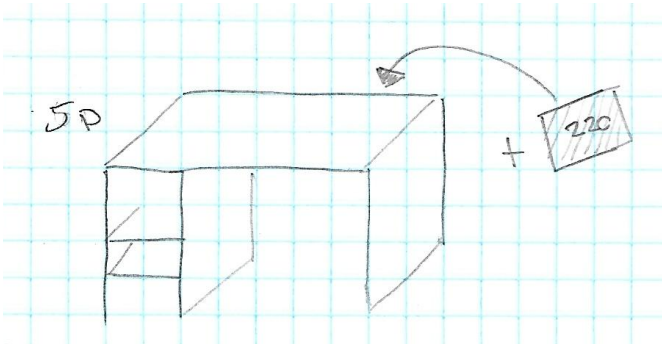
B. Use 120 grit sandpaper to remove the excess wood putty and the reference lines from the desk. The desk should be smooth with no visible imperfections.

C. Use a 2” foam brush to apply one coat of MInwax Polycrylic in satin finish to every surface of the desk. Use a dry tack cloth to remove any excess protectant. Let the first coat dry for 4-6 hours.



D. Grab one sheet of 220 grit sandpaper and lightly sand all surfaces of the desk. Use a dry tack cloth to remove all the residues remaining from the sanding process.

Tip: You can use an old white cotton t-shirt if you do not have a tack cloth.



E. Apply a second coat of Minwax Polycrylic to all surfaces on the desk. Let the second coat dry overnight. The finished desk should be smooth to the touch and must not have any visible scratches.

Tip: If you do feel areas in the desk that are rough to the touch, use 220 grit sandpaper to sand the area smooth.