Shopsmith Mobile Storage Cabinet

by **Beave2012** on May 3, 2015

Table of Contents

Intro: Shopsmith Mobile Storage Cabinet

Recently I purchased a Shopsmith Mark V from a family member in my mission to get a woodworking shop. I was also confined into a small space, aka my garage, so the Shopsmith fit the bill perfectly. After getting it home and unloading all the accessories I found that there is a lot of small pieces, and in this case, accessory parts from 3 machines packed into one purchase. My garage is already packed full, so its time to use my space efficiently.

So under the Shopsmith is a ton of unused space just waiting to be used. While I am not the first to come up with this idea, I made it specifically to my needs, while undertaking my first cabinet build.

My Mission: Build a cabinet under the Shopsmith that can act as a permanent part of the machine, but in the case I need an additional table or for some reason get rid of the Shopsmith, I can detach it and it will work as a regular cabinet as well. Oh yes, and do it with a single sheet of plywood, 6 hinges, 4 bolts, 4 nuts, and a lot of glue. No screws or nails (except for the hinges).

The design: A basic cabinet carcass with 3 hidden hinges with 2 detachable hangers to hang off the Shopsmith tubes. When the Shopsmith is on it's base the cabinet hangs around 1/16" off the floor (can barely slide a few sheets of paper below it), and when its lifted onto the casters it gives me around 1/2" off the floor to move it.

Additional Thoughts: I asked myself if I should make an instructable about a specific tool, and here is my reasoning. You can pick these up for around $500 on craigslist and with a little sandpaper, wax, and oil, you can get started with woodworking and have most of the power tools you need all in one system. For the home DIY individual, its hard to beat that. For the professional, I will let the web forums battle that out. Secondly, this is simply a cabinet build, if you don't have a Shopsmith, don't make the hangers and you have a nice solid cabinet for whatever use you wish.

This is just a guide, your responsible for your own safety and those around you! Read your instruction manuals. If you are unsure of how to do a specific cut or procedure, do more research before you do it. Its better to have a half completed project than half a hand.

With that, lets get started...

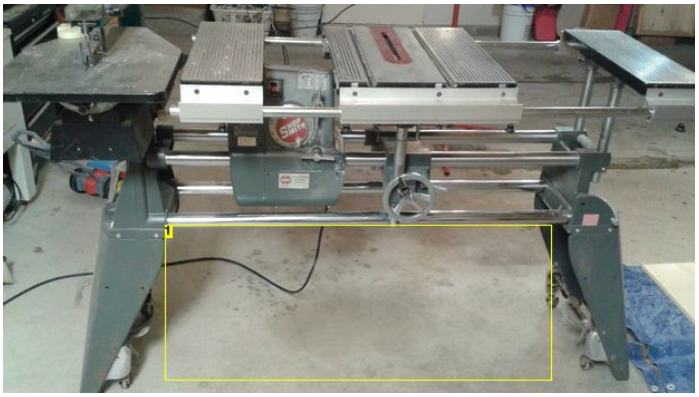


Image Notes
1. Wasted Space

Step 1: Gather the materials

So the material list is fairly basic,

(1x) 4' x 8' x 3/4" sheet of double sided birch plywood (Home Depot)
(8x) 1/4" x 2" Bolts w/ matching nut (Home Depot)
(4x) Full-Overlay Euro Style Hinges (Menards)
(2x) Half-Overlay Euro Style Hinges (Menards)
Wood Glue (I used Titebond 3)

-For the shelves I used some extra 1/4" birch plywood I had laying around. However, you can omit the shelf, change them to drawers, or whatever you feel like at that point.

Tools Required:

Shopsmith*
Dado Blade
Bar clamps, smaller clamps, rope, etc... Whatever you can use to hold it together while the glue dries.
Drill bits
Bandsaw (or coping saw would work as well)
Circular Saw (to help trim down the 4'x8' sheet at the start)
Square
Screwdriver (just for hinges)

*Note: If you do not have a Shopsmith, you would need a table saw, drill press, & portable drill as a replacement for it.

Step 2: Piece out the plywood

Cutting the plywood into more manageable pieces is a great place to really start. For this, because of the size of a 4'x8' sheet of 3/4" plywood, I found it much easier to clamp down a straight edge on the plywood, and then use a circular saw to cut them down to size. It is just much easier to move a saw than that large of a sheet of wood. Although, some people don't mind cutting that large of a sheet on a table saw, I am just not one of them.

Once you have the basic cutouts, we can be done with the circular saw and stick to the table saw.

Here you will also see the sketches I made of the project with dimensions (the bracket is an old style and was modified in the process

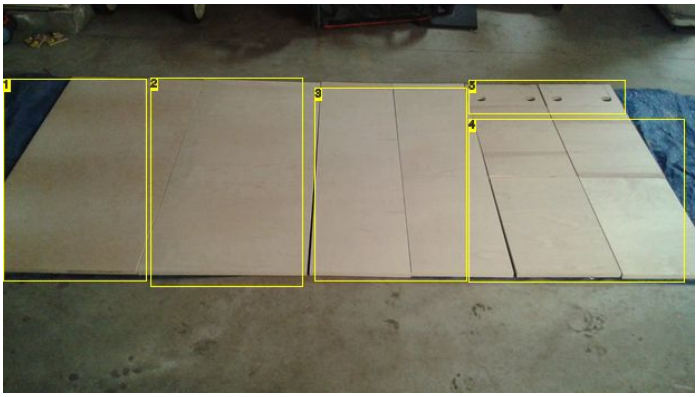


Image Notes
1. Eventually this will become the doors
2. Back of cabinet (Not trimmed lengthwise yet)
3. Top and bottom sections of the cabinet (not trimmed lengthwise yet)
4. 2 sides & 2 dividers
5. 2 cabinet hangers

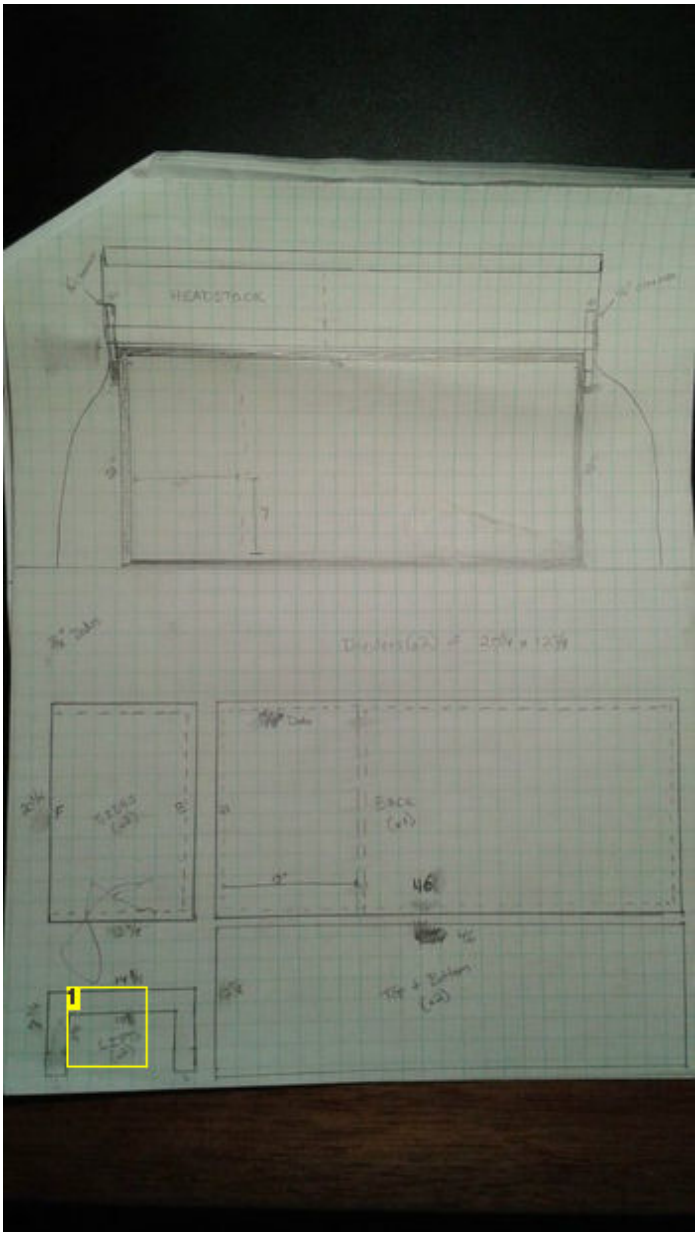
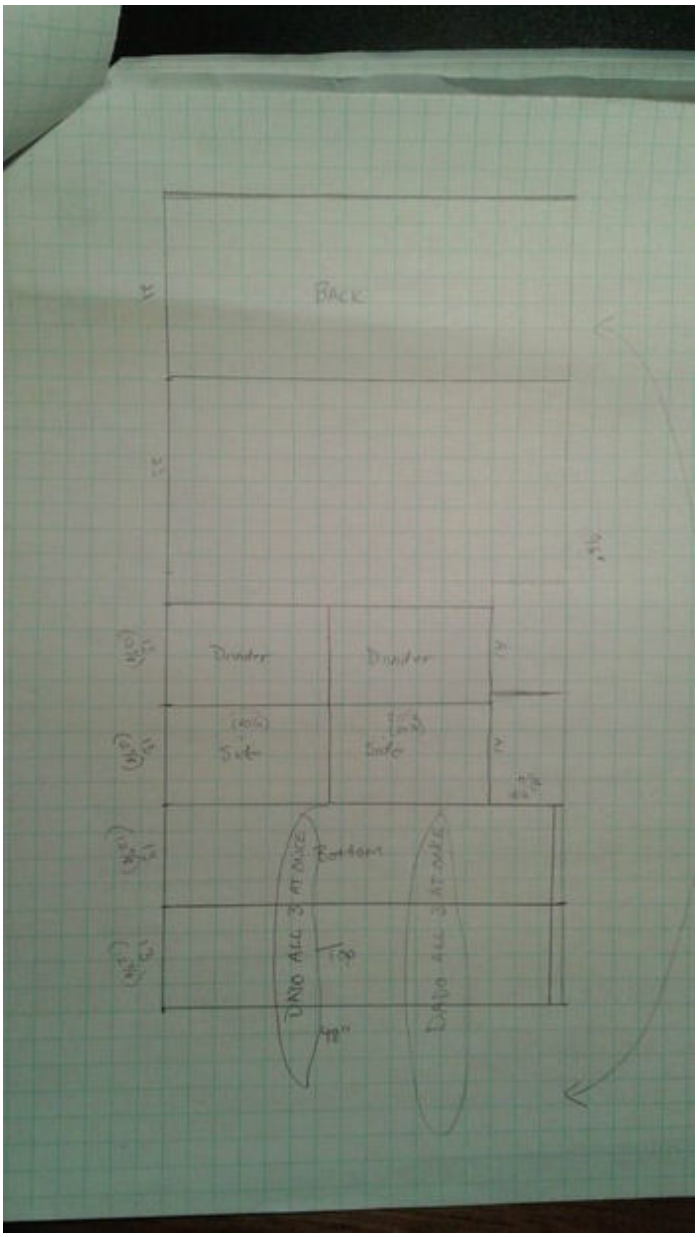


Image Notes
1. Here is the old bracket I was going to make, instead of clearing out the bottom entirely, I now notched in the bracket so I could add more bolts in the center as well.



Step 3: Create the Hanging Bar

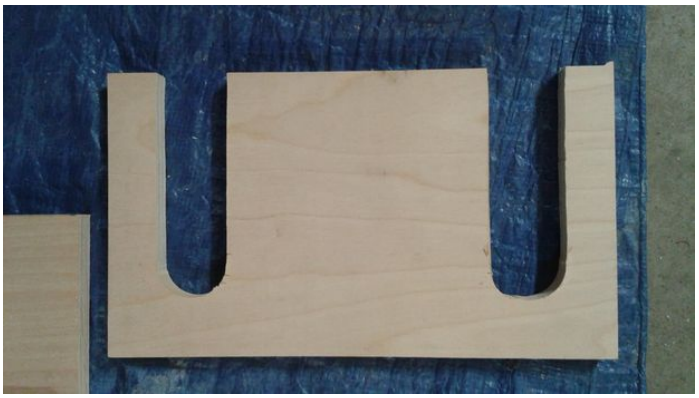
The hanging brackets are a simple "M" shape with 2" on each side of the tubes and provide enough length so that we can later get the bolts into the exact position so that the cabinet is not touching the ground when the cabinet is on the base.

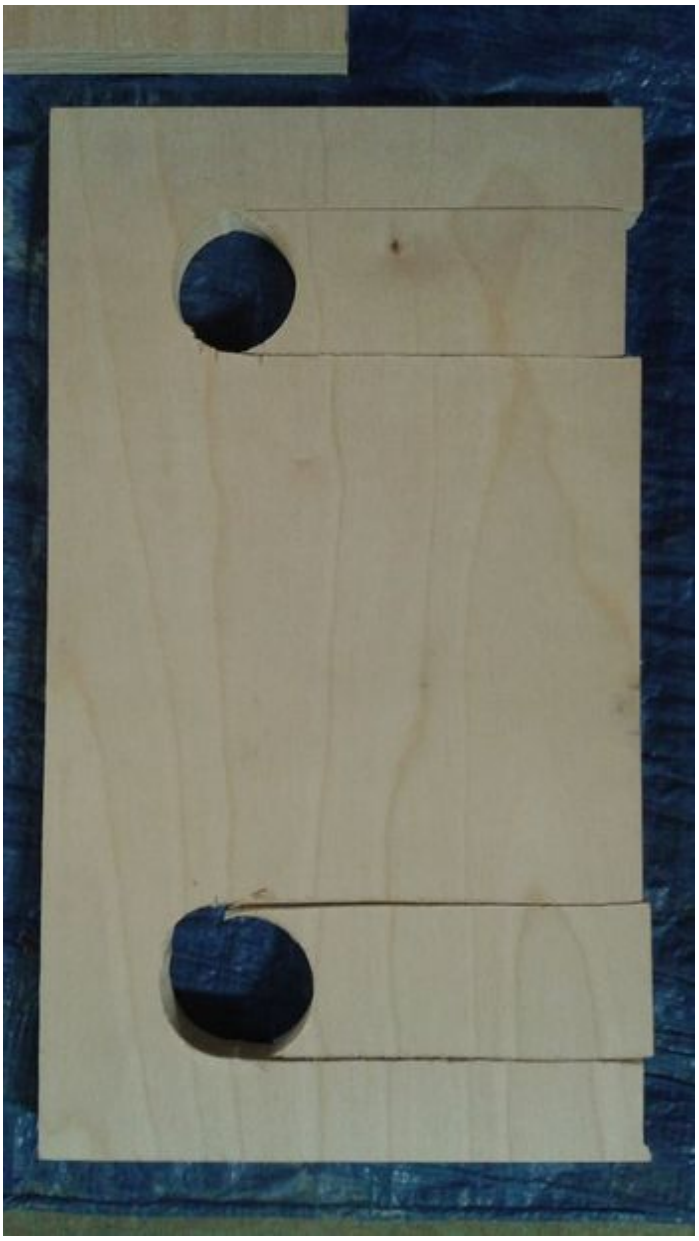
This was done because I have my unit in a cement floor garage, and I wanted to avoid direct contact if there is any moisture or condensation that may occur. At least there is a small amount of air that can run between the cabinet and the floor. Additionally, the benefit of a separate hanging bracket allows me to detach the cabinet from the Shopsmith and use it separately from the Shopsmith if I desire. A second assembly table for example.

To determine where the holes go, determine distance between the tubes, and subtract the diameter of the 1 of the tubes. That will give you the distance between the holes, so take half of that measurement, and mark to the left and to the right of the horizontal center of the board and that is your drill mark. Make sure to keep around 2" above where the hole ends as the entire cabinet will be supported by this piece.

Now drill out the location of the tubes with a 1.75" forstner bit and use the bandsaw to extend that hole straight down to allow it to slide onto the tubes. Place it over the lower tubes to ensure a tight fit.

Tip: Use a couple of squares placed across the tubes to determine the edges of the tubes (since this needs to be exact and its hard to measure a cylinder with a tape measure). Once you have





Step 4: Cut your Dados

Time for some joinery. We are going to use rabbet joints to hold the box together with a dado slots for our shelves. The key to the dado cuts is the ensure you have downward pressure on the plywood around the blade so that it cuts perfectly half way through if there is a slight lifting of the panel.

First set your Dado to exactly 1/2 the thickness of your plywood. Clamp a scrap piece to your fence to protect your fence since the dado will run almost flush with the fence for the first round of cuts. Then use some scrap from your plywood to do some test cuts. Once you can join your 2 test cuts to a perfectly flush corner with one another you can start running a dado cut along the top, bottom, and back of your side panels and dividers. You also can run it around all 4 sides of the back piece, and sides and back of the top & bottom panels. Make sure you lay it out and pick what sides you want on the outside and what ones you want on the inside, so you rabbet the correct side.

Additionally, note that the side panels are set inside the cabinet with the top panel, the bottom panel, and the back panel all overlap it giving it the added 1/2 thickness to each of the 3 sides. Now if your planning on using the bottom shelf for something heavy you may want to change the rabbet on the bottom shelf so that the it is more tongue and groove style, so that downward pressure is on the sides panels, rather than a glued rabbet joint that is facing the "wrong" way. For this purpose however, there should be very little stress on the bottom shelf regardless, so I will trust the glue.

Once all the edge dados are cut, you can cut the shelf dados. DO NOT ADJUST THE HEIGHT OF THE CUT UNTIL ALL DADO CUTS ARE COMPLETE. Simply move your fence to the desired distance for the first shelf, and cut it. Make sure you cut each shelf dado at the same time across all dividers and the back to ensure they will all be parallel. I varied mine quite a bit and did not add shelves to the center cabinet because I wanted the center dividers to only have dados on one side of the sheet (If I ran them for the middle as well I would cut dividers into pieces unless I changed the height of the cut which would be a pain). I varied the heights so that I could adjust the shelves to whatever height I wanted to accommodate a variety of different objects.

You then also need to run a dado down the back and down the top and bottom panels so accommodate the dividers.

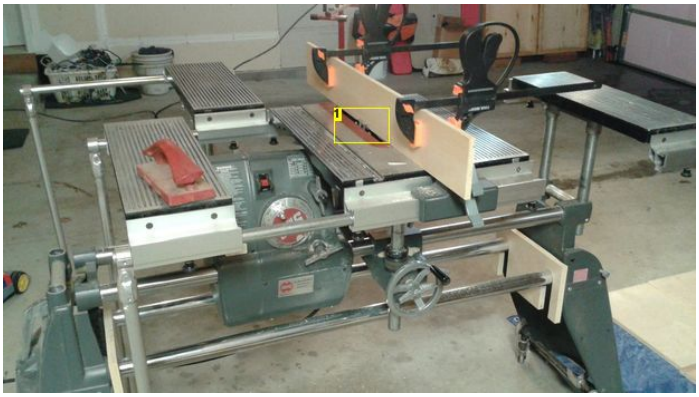


Image Notes
1. Scrap piece clamped to fence with a nearly buried blade. This is to protect my actual fence. when rabbeting the edges

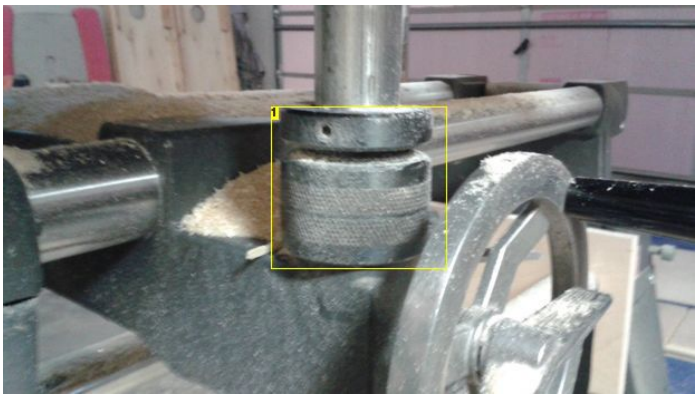


Image Notes
1. If you need to adjust the height slightly, you can use one of these handy micro adjusters.

Image Notes
1. To help support longer panels I flipped the floating table round with 2 extension supports so that it wont just fall at the end of the cutting table.

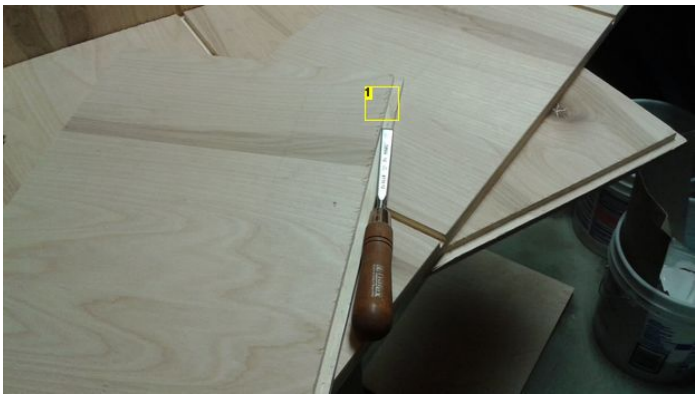


Image Notes
1. if you get some odd uneaven areas, a chisel will help you even it out. Although I only ran into one instance, it was likely me not holding it down at the time.

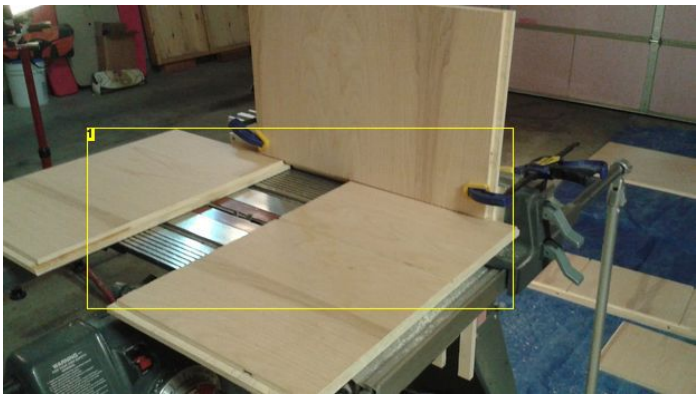


Image Notes
1. when cutting shelf slots, you may need to keep the distance of the side panels out by 1/2 your panel's thickness so use your other panels clamped to the fence to give you that exact distance added to the fence without having to move the fence.

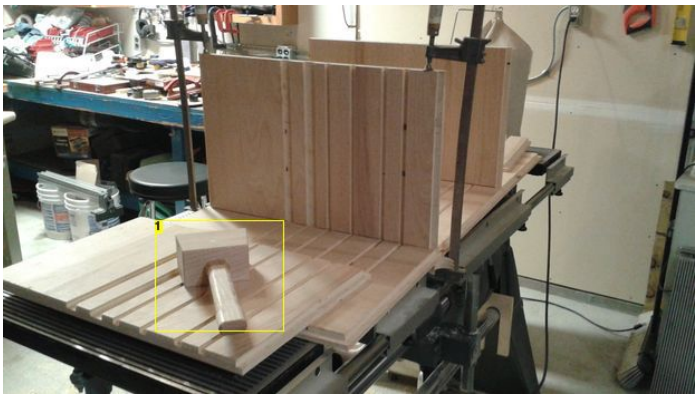
Step 5: Assembly

Now take time to dry fit the cabinet to ensure it all goes together the way you want it to. Make the necessary adjustments before you start the glue process.

Once it all fits properly, start gluing in all the sides and dividers, clamping them for around 30 minutes minimum a piece. We want strong joints since we are not using nails or screws, so the longer the better. Be sure to check and make sure everything is square along the way. The benefit to having the back having a rabbet around the entire back is that it provides you with a perfect pattern for everything to fit into, so its hard to get it out of square.

If you don't have enough clamps (I ran into that problem), get creative. A ratchet strap works well, as does a rope with a board tied to it that you can twist to get it tight. Just be sure you add some scrap to the areas the ratchet strap or rope touch so that you don't cause an indent in the cabinet.

Let the entire thing dry for a long while under pressure so that you don't break any glued joints.



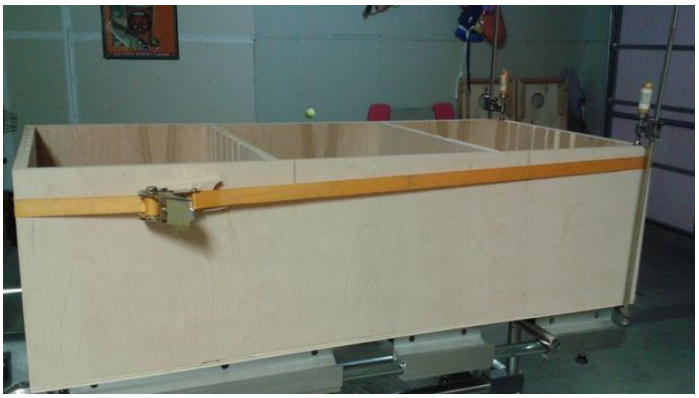


Image Notes
1. Some pieces may need persuasion.

Step 6: Hanging bracket alignment

At this point we want to place the cabinet under the Shopsmith and ensure we are properly aligned. Now you can mark up where the brackets meet the cabinet and decide if you want the cabinet to be on the ground when the machine is on the base, or if you want it to float. Start by drilling out the holes near the top of the sides of the cabinet. As long as they are the same distance from the top and match up with the brackets M shape it wont need to be an exact height, that we can do with the brackets themselves. For this I simply used the horizontal boring function of the Shopsmith. As you can see I used 4 bolts per side since the cabinet will rest its entire weight on these bolts and holes in the plywood.

Then, simply lower the Shopsmith off the casters over the cabinet to see where your holes in the bracket need to be.

IMPORTANT! Make sure you position it properly depth wise as well. To do this, lower your saw table so the main table's tubes come down and wrap around the cabinet, and make sure you leave room in the front for the 3/4" doors we will put on next. So you may want to use a piece of scrap, and then move the table end to end of the Shopsmith to make sure your parallel with the cabinet.

Once its aligned, mark the brackets through the holes you drilled in the cabinet, and use the drill press mode to drill out the holes in the brackets.

Added Bonus As I progressed to this point I kept losing my Allen wrenches to change tools, so I drilled holes in the top of the mounting brackets so that it I can slide them into the brackets as a permanent storage area that is easily accessible. I also drilled the bottom right hole a bit larger to store the drill press chuck key. I always set that down somewhere, but in that spot its easily accessible. So far its worked great.

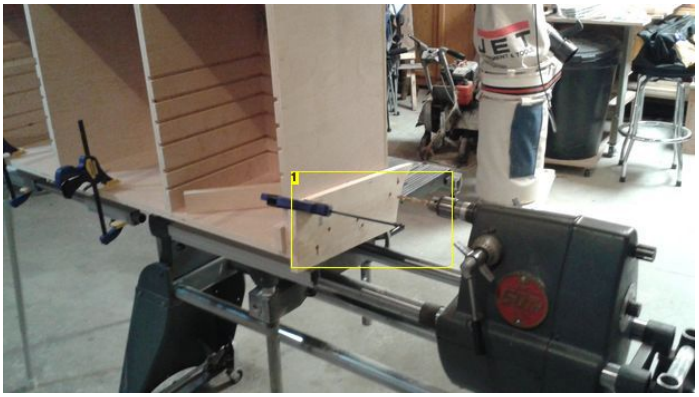
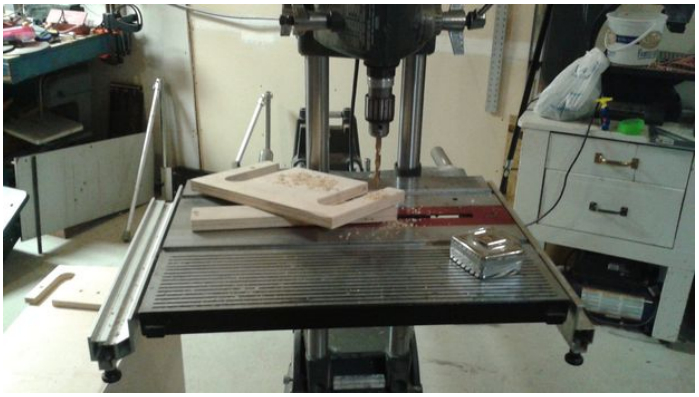


Image Notes
1. clamp a piece of scrap to both sides of the drill point to prevent tear out



Step 7: Doors

For the doors, simply cut out your 3 doors, giving around 1/8" gap between each of them. Have the doors flush with the outside sides of the cabinet, centered on the middle dividers, flush with the top and the bottom (or you can give it 1/8" shy of the bottom like I did and wont be noticed, but also provides a bit of protection for the door if you drag the cabinet over a screw. That way it hits the cabinet carcass rather than scratch up your door since its so low to the ground.

Once you get the doors cut, follow the directions for the euro hinge install that comes with the hinges. Do not install them yet, simply drill out your recessed hole in the door with a forstner bit for your specific hinge. Make sure you plan for the brackets to go outside of the dado groves on the sides of the cabinets or you wont be able to screw in the bracket.

Step 8: Protective coating

Now sand everything down any rough edges you see, but not too much so that it takes off the veneer of the plywood. There shouldn't be much if you had a sharp blade for the cutting. Then apply a coat of wipe-on poly (you can use other types of poly acrylic, but I like the wipe on method). Make sure to hit up every surface.

After the first coat dries, sand it down with some 120 grit paper, just to smooth it out not take off the finish. Then reapply. After it dries again, bump it up to 220 grit and sand it. Make sure you wipe it down with a damp cloth before you apply each coat to get rid of any dust. Put on your final coat and let it dry.

Step 9: Final assembly

Now that you have finished the cabinet you can make your shelves to fit in the groves, make as many as you want, test fit your tools to fit in the cabinet. For mine, I have 3 sanding discs in the left side, 1 conical sanding disc, my extra sanding disc papers, and a palm sander and an orbital sander. The middle will be for lathe tools and larger pieces. The right side is setup for the saw blades, safety equipment, and a few common accessories to have them right with the Shopsmith. The bottom shelf is even big enough for the lower saw guard with a blade.

After the shelves are in, put on the doors per the hinge instructions, and bolt on the cabinet to the brackets. You now have a perfect setup for your Shopsmith accessories that will go with the Shopsmith. This was my first cabinet build and it turned out well beyond what I expected. It really pays off to plan everything out prior to making a single cut. You may also notice there is no handles, at this point I love the look of the solid wood, and was going to groove out the top of the doors for finger grips, but then my wife told me it would just catch sawdust so I avoided that. Handles one day, maybe, until then its not hard to open them by simply pulling on the top of the door.

My tip for new woodworkers (like myself) is to eliminate any influence you have on the cuts, use the fence, make a jig for cuts if needed, do whatever you can to eliminate any extra variables that may cause a bad cut from a perfect mental picture of how it should have turned out. Precision is the key, well that and sharp saw blades. Dull blades are dangerous and cause tear out.

As an added note: The only affiliation I have with Shopsmith is that I own their product. I think its a great way for the DIY community to get into woodworking since they are sold on craigslist for a fairly cheep price. They just take some getting used to for those seasoned professional woodworkers because there is a lot of preplanning involved. For the homeowner, it provides professional accuracy with nearly every tool you may need for most projects, and if you go the pre-owned accessory route, you can really build up a shop for a low price.

Image Notes
1. To make the most use of the space I made this door wider so that the spindels of the 2 top sanding discs can share the same space. This way I was able to add an extra shelf for the extra sanding papers.

Image Notes
1. Highly ugly organization in this cabinet, however the plan is to make a decent organization for all the lathe tools. Most likely a vertical drawer for the chisels and we shall see for the rest.