

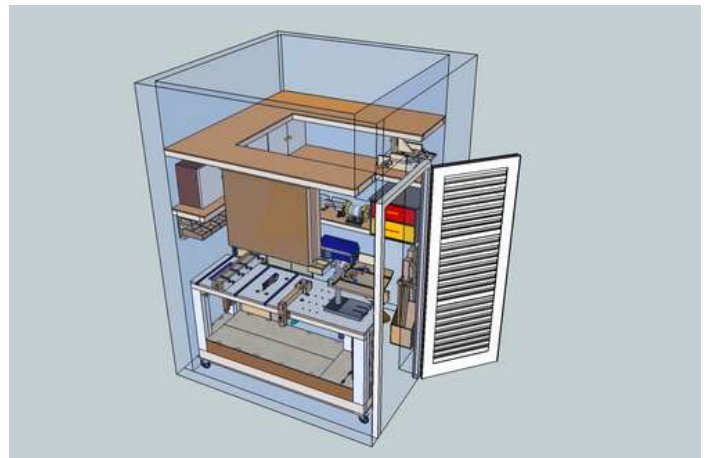
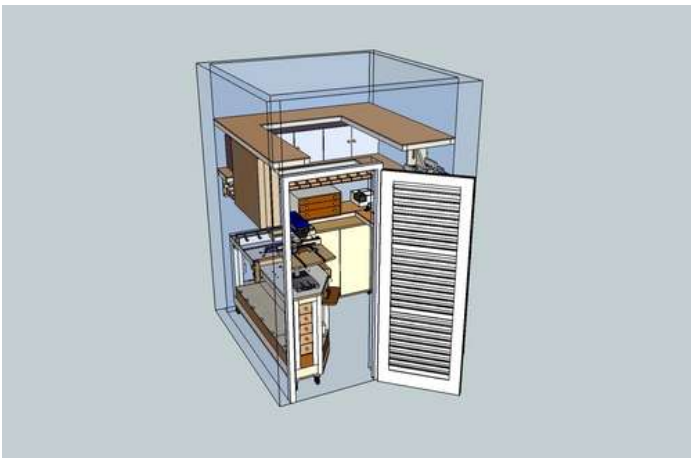
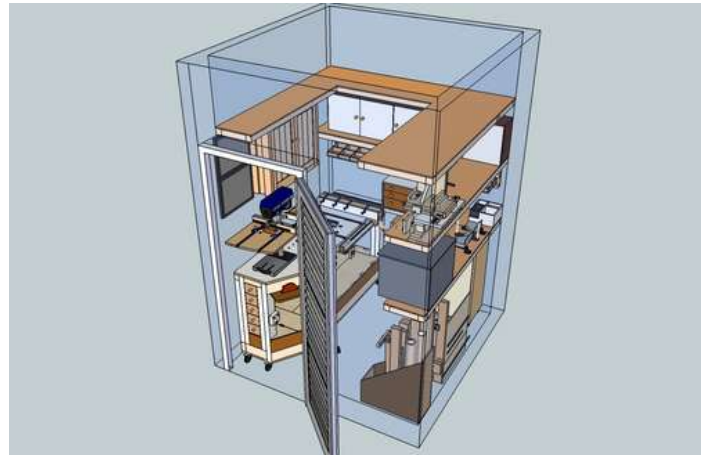
The Ultimate Smallest Workshop

Intro: The Smallest Workshop

Been a woodworking enthusiast is not enough especially if you don't have a place to work and you live in an apartment court. If you have no budget and space for big machines, this would be the perfect setup for you.

So at my open air parking space which I have in my building there's a small storage room with dimensions a bit more than 5X5 feet (1.6X1.6 meters). In that space I decided to keep my workshop and work openly in my parking area.

The problem is that you can spread things around in that parking space but everything has to be stored and locked safely when you are done as well as to clean the area. Fortunately my neighbors had no problem with me doing so, but I am also been careful running the power tools only at selected hours.





Step 1: My Multi Power-Tool Bench

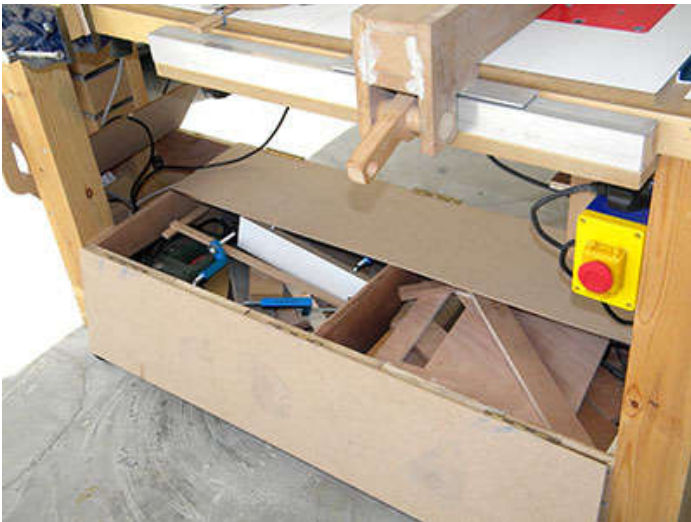
I decided to build a multi power-tool bench 59X20 inches (1.5X 0.5 meters) which will fit into my storage room and hold simple hand tools that will allow me to build any woodworking project I want. Made out of 2X4" and 2X2" for the body, plywood for the sides and an 3/4 MDF top laminated with Formica for better strength.

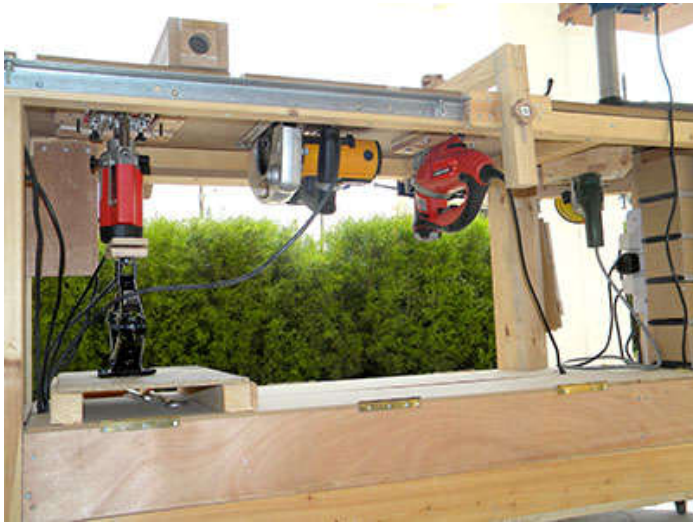
The tool bench holds 5 major tools, drill press, sander, jigsaw, circular saw, router with a lift device and the possibility for a lathe (later addition).

It also has a vice, 5 small drawers (one for each tool's small accessories), under storage space, and 8 electrical sockets with wiring. The bench sits on 5 casters with stoppers so that it can easily roll into and out of the storage room.

You will also noticed that there is an angle cut on the bench design, that was done so that it will allow me some space to pass through into my storage room even when the bench is inside it.







Step 2: 1. Drill Press

My bench top drill press was modified for better workability. I changed the old pole to a stainless steel one, which is taller and allows me easier up-down movement. Also I attached a drill press accessory bar made from a piece of aluminum angle and two shallow boxes from 1/4 inch MDF, and it has been proven to be a very useful asset to the drill press.

I have also made a drill press table from an old office shelf together with a plywood fence that pivots at one point and a stop block. Some home made hold-down clamps run into the two T-tracks which are nothing more than simple curtain aluminum tracks. The drill press table has two 1/4 (6mm) plate inserts on top each other, one has the standard drill press hole opening and the second plate a larger hole to fit my drill press spindle sanders.

Another accessory I made for my drill press was to attach over the drill press table a piece of plywood base with two homemade knobs to hold onto the t-tracks and my drill press vice mounted on it.

The old depth-stop system with the 2 nuts was so unfriendly to use, so I came up with an easier way to work around this problem. A small piece of hardwood and a threaded iron base with a small knob, made the depth-stop now very easy to adjust and use. Then I replace the broken plastic depth ring with the one made out of clear 3/8 acrylic. Two magnets one holds the drill press chuck always in the right place so I don't lose it every time, and the other one on the top holds my plastic bit cleaning brush.





Step 3: 2. Disk Sander

My very old drill was used to become my disk sander. Mounted under the table with a sanding wheel velcro attachment and a sanding table makes perfect job. With the help of a friend we rewired the drill's electrical functions and put everything in an electrical socket box. On and Off switch - Forward and reverse - Fast and Slow fixed speed - adjustable speed control, all functions run smoothly and it's so handy (see picture below).

The sander's table is attached with two threaded inserts on the tool-bench, bolts and wing nuts through the table to tighten it to the bench.

The sanding table has several functions, one is the use of a simple T-square for parallel sanding, has an angle guide for sanding miters and a circle sanding jig attachment for cutting perfect circles from very small ones up to 12 inches (30cm) diameter circles.

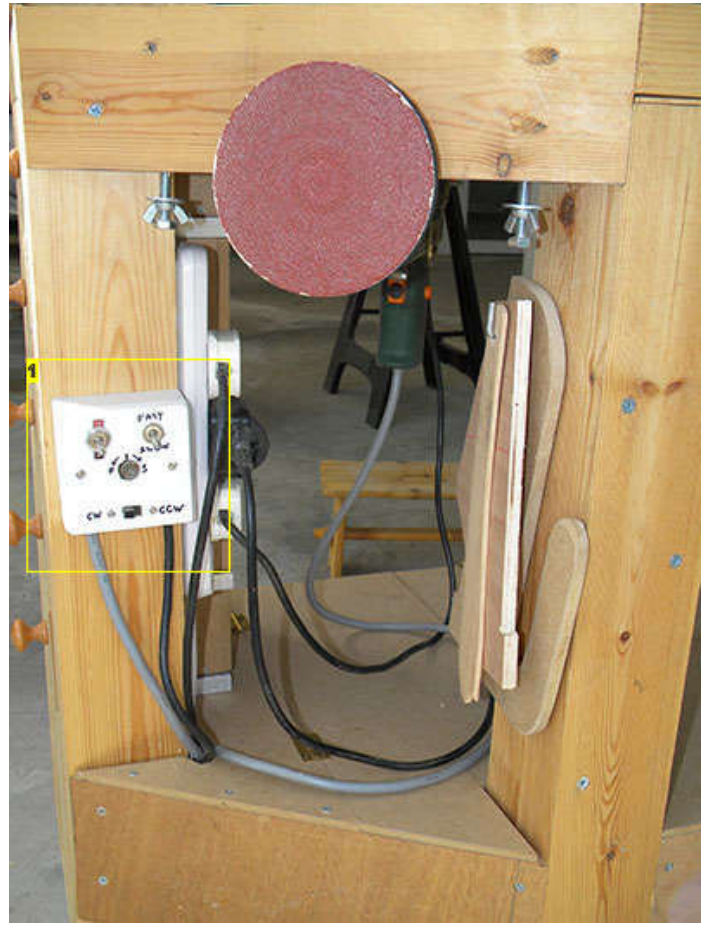
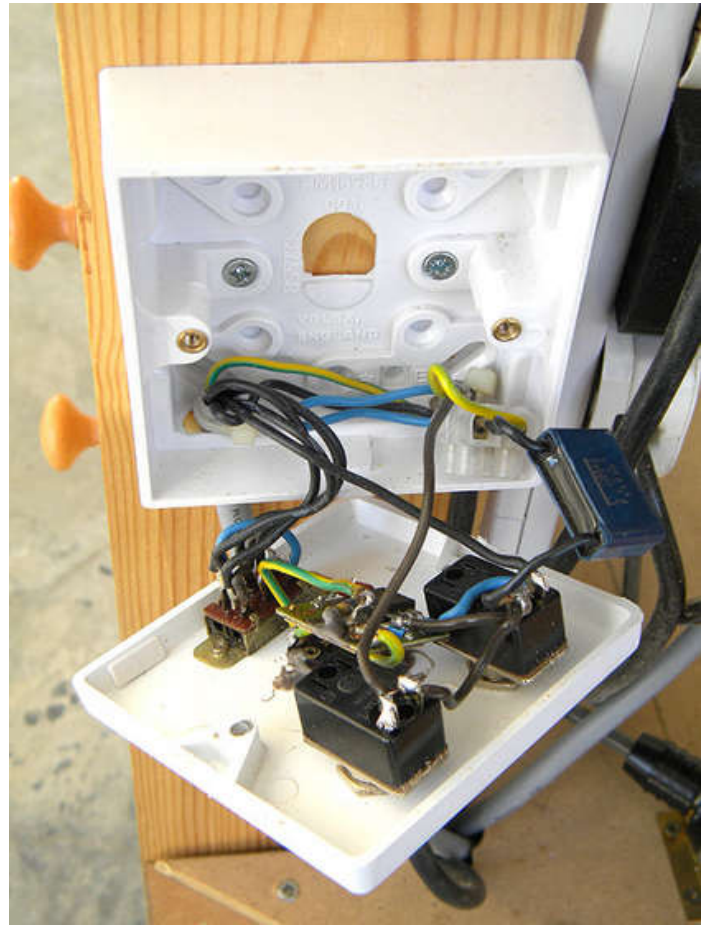
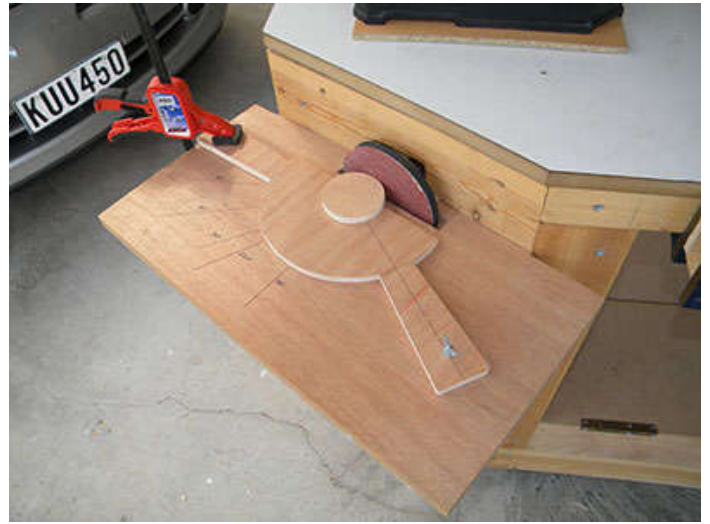


Image Notes
1. Drill sander control panel







Step 4: 3. Jig Saw

The Jig Saw is mounted upside-down under the tool-bench with t-nuts and 8mm bolts, and over the top a hold down arm design system (ShopNotes #23 Magazine) with a blade guiding system which guides/holds the blade with the help of two bearings can cut very good as high as the blade you use.

Very practical for cutting patterns near the line and finish them with your sander. Also the use of a good quality wood blade like BOSCH you can cut very straight and give precise perfect finish results.

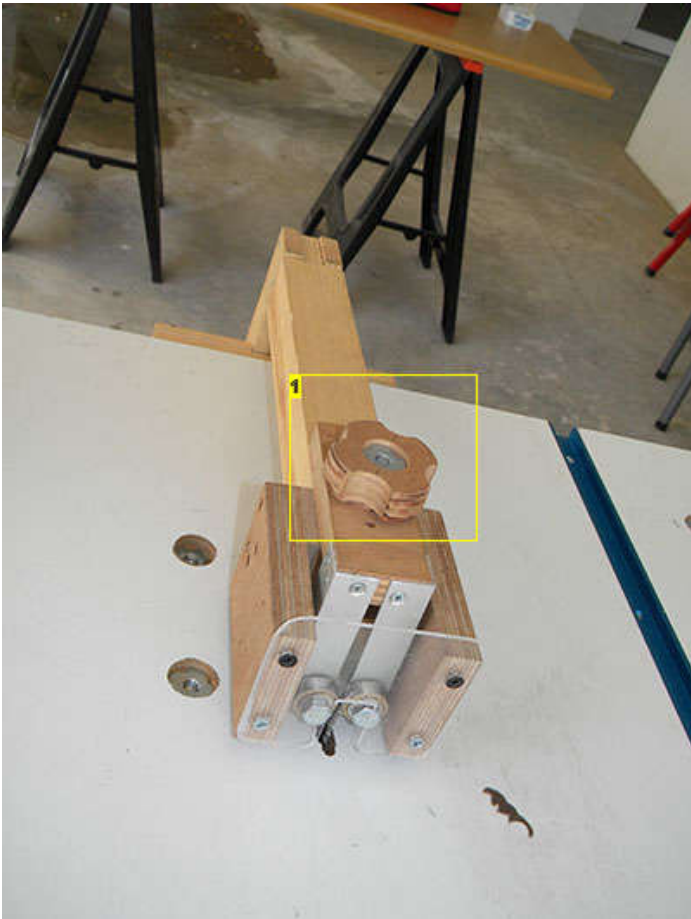


Image Notes

1. Homemade knob, Plywood and 8mm t-track



Image Notes

1. This B&D jig saw is good but the knob gets loose and slightly tilts left or right. Much better tool for top work, maybe I will change it with something more sturdy.

Step 5: 4. Circular Table Saw with Fence & Miter Gauge

I mounted a circular saw under the bench and hold it with 4 bolts and wing nuts. I made 4 holes on the circular saw base 3 of which are elongated for fine adjustment. I also cut a space for insert plates from 0° to 45° clearance and added 2 miter track slots to the left and right. The circular saw is powered by a safety stop switch and can hold a riving knife also on the blade (not shown here).

My wooden rip fence is made out of 3/4" MDF body and hard wood for the round center piece and the off-center handle; also a small aluminum angle is used to run on the fence guide rail. Its design is based on Biesemeyer fence. Left side of the fence is used for ripping with the circular saw and the right side is used as the router fence with an opening and dust hole.

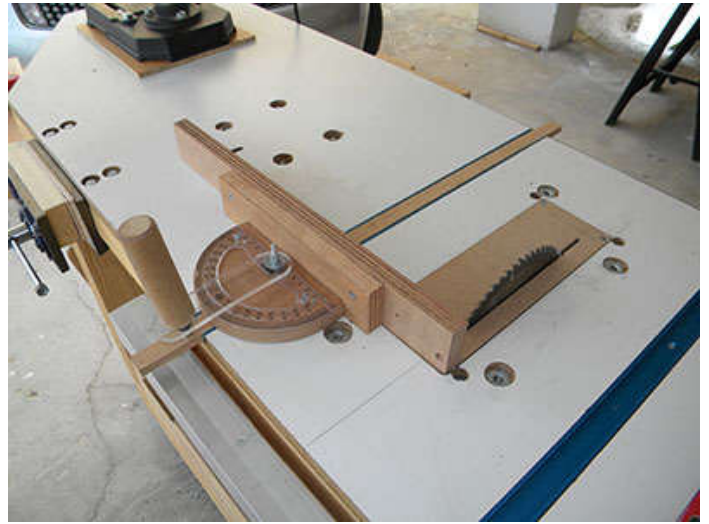
The fence guide rail is simple 2x2" attached along the side of the bench and with an aluminum angle across it so that the fence locking mechanism won't damage the 2x2" when tightened. A UHMW tape is used to help the 2 aluminum angles to run smoothly.

Some push sticks have also found their way on my tool-bench. Even though almost everything here is home-made, security was always in my mind before anything.

My miter gauge is a mixed idea from various DIY designs (one is from Phil B instructables). Hard wood bar piece to run into the miter track slot, plywood for the body, a clear protractor, a piece of thick clear acrylic and a wooden handle with a T-nut at the bottom to act as a tightening handle and keep everything tight in place.



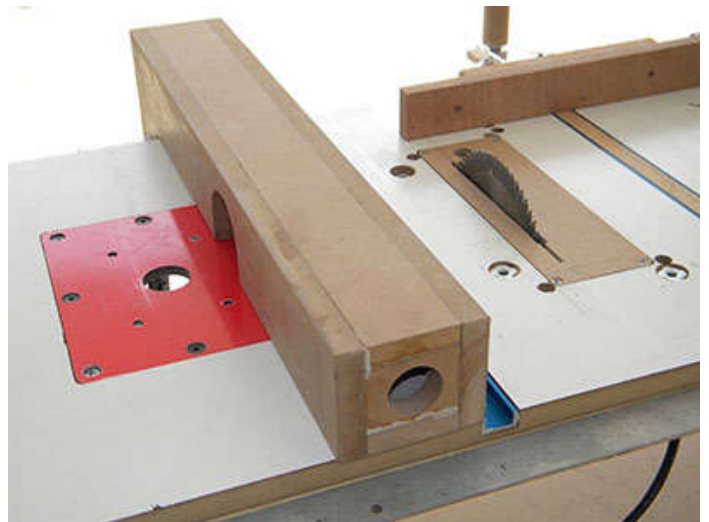
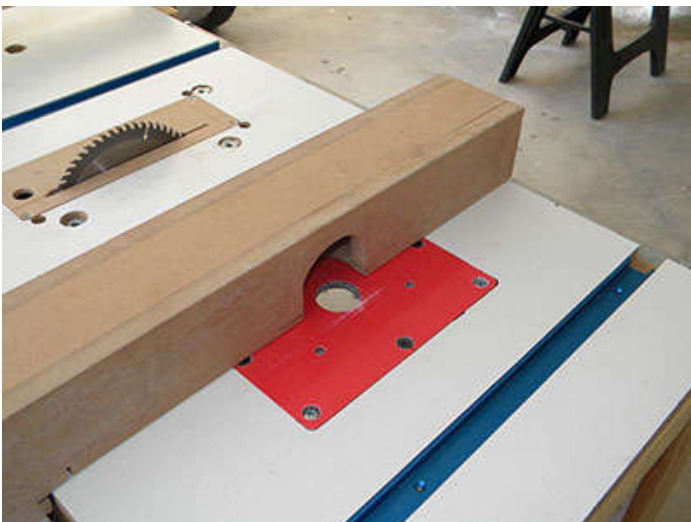


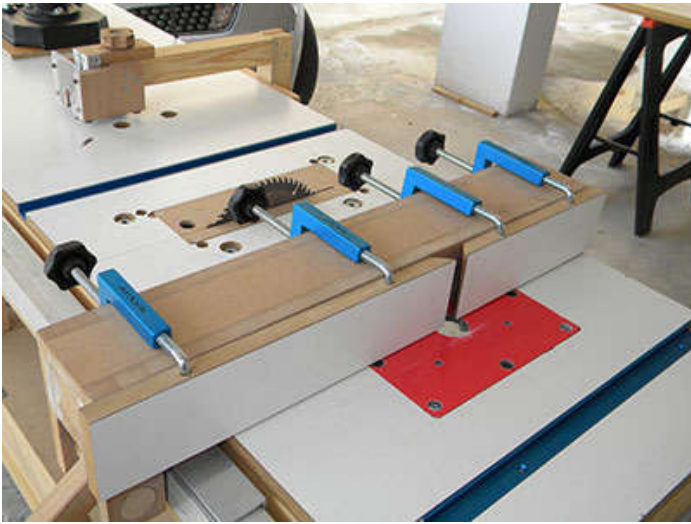


Step 6: 5. Router with Fence and Lift

Installing the router is no different than other tutorials. I made my own router table plate from 11/32 clear acrylic on which later I put red plastic adhesive for color (the clearness of the plate was distracting me from the work piece). A miter track slot is also there and on the joint circular saw and router fence I can now attach an external 2 piece fence with the use of special clamps.

An inexpensive router lift method is used with the help of a scissor car jack. Mine is a replacement out of my car's jack as it is very smooth to turn and has accuracy down to the millimeter.





Step 7: Bench Vise

An inexpensive bench vise always comes in handy on any bench, so is mine.



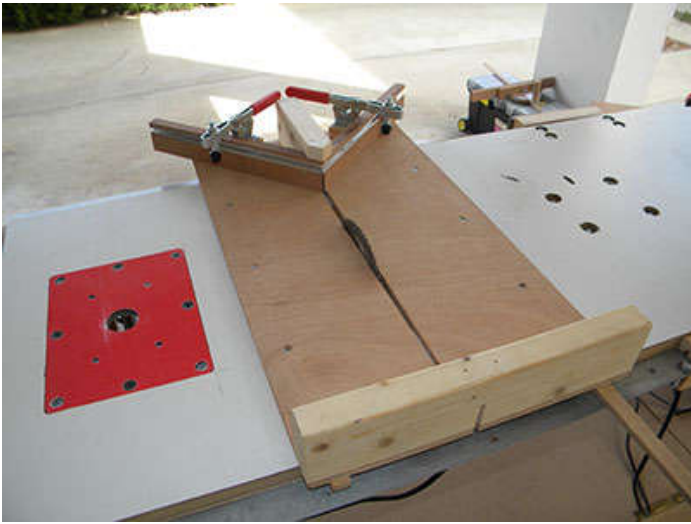
Step 8: Cross Cut Sled

My cross cut sled is 2X2 feet of 1/2 plywood, 2X4" fence and an acrylic piece for safety. A mixed design from various ideas runs on metal miter track bars and its true 90°, can do without it.



Step 9: Miter Sled

The miter sled I build is based on the David Marks aluminum one and is made basically from plywood and some scrap pine wood. The T-tracks are from aluminum curtain tracks (try them they work perfect) and 2 metallic hold downs and a stop block complete the project. Perfect 45° miters every time.



Step 10: Bench Extensions

I have made 2 extensions for my multi power-tool bench. One piece serves as an extension to the circular saw and router area and the other one as an extension to the front side of the router.



Step 11: Assembly Table

Using a kitchen counter top and 2 saw horses I have a mobile assembly table that serves me well.



Image Notes

1. My Milwaukee lithium drill is one of the best tools I ever bought
2. A portable bench vise

Step 12: 5X5 feet Storage Room

Some thrown away shelves from a friend and some 2x2 made my shelving system. A few drawers and lots of plastic containers keep me organized as much as I can.

One wall mounted cabinet to keep accessories inside. An old narrow bookcase thrown sideways and added a few doors serves me as small cabinets to keep my essentials.

I keep all my power tools in there plastic cases to keep them safe from humidity (we have lots of it here). I had to screw a double layer nylon to the inside face of the storage room aluminum door to keep the humidity out and keep things from rusting. Over the door I install a strong light that tilts inside out.

I have a good collection of small medium clamps and now I am building up my stock on the big ones (you can never have enough of these). A bench grinder it's also inside there together with my tool storage cabinet. A tiny area is kept for some wood left over wood pieces; unfortunately I cannot store any sheets of wood for more than few days.



Image Notes

1. My grinder. Need to think of a way to mount it somewhere because is vibrating.
2. Strong light, tilts inside out. The bulbs are more expensive than the unit :-)





Image Notes

- 1. Couple of 90cm pipe clamps
- 2. 3 straight edge clamps



Image Notes

- 1. A timer is used for my battery charging



Image Notes

- 1. A Note Caddy very handy for small notes

Step 13: Tool Storage Cabinet

A simplify idea from the WOOD Special magazine. Its dimension are W32XH32XD13 inches and is a very clever idea to have lots of storage in a tiny space, about 7 square feet of wall area will give you about 26 square feet of storage space.

At the bottom of the cabinet there are 7 removable screw bins (2 divided in half) which holds most of the common screws I need. Bins are made out of 3/4" plywood and 1/4" MDF.

Made of 3/4 plywood it rolls on 4 casters so that its mobile and I can roll it out to the open if needed. The only trick here is to organize it correct - plan it on paper before putting up the tools on the wooden surface. I think it's one of the best storage ideas I have ever seen.





Image Notes

1. 7 removable screw bins (2 divided in half) hold most of the common screws you need