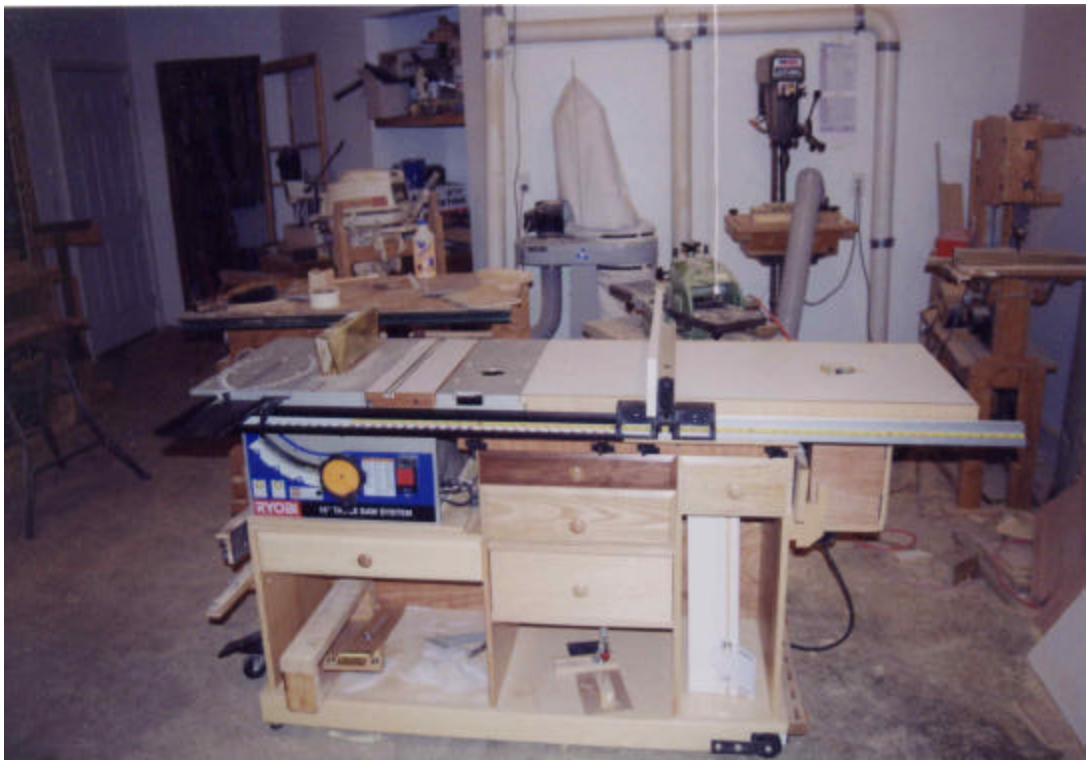
Spruce and Sandeply – Another base option

By Jim Dwight (aka JimD)



The thought behind this base was to create something a bit smaller where the basic structure could be cut from one sheet of ¾ plywood. I didn't quite get there – it's more like 1 ½ sheets – but I like the result. The other main difference from some of the other options is the method of attaching the rails and extension table. The rails are clamped to the base through use of the slot on the bottom of the rails, pieces of 1/8 x 1 (front) and 1/8 x 1 1/8 (back) flat metal (aluminum or steel), and knobs with 5/16 by 1 inch studs. Holes are tapped into the flat bar stock. The knobs pass through L-shaped brackets screwed to the base. Tightening the knobs pulls the flat bar tight against the rails and the rails tight to the L-shaped bracket and thus the base. The extension table is held in place the same way using the slots on the inside of the rails. The net result is rigid attachment but you can move the rails and/or extension table as necessary (to tilt the saw up for cleaning or to shift the rails for wider rips). I also incorporated a mobile base from Harbor Freight which I like. It was cheaper than good locking casters and works well.

Construction Notes

I started with the base which is a torsion box. The outside is mostly one clear spruce 2x4 that I culled from a basement wall project – I decided a clear 2x4 was too good for a wall. It has been sitting in my wood rack for about a year so it's dry. The bottom is 7/16 wafer board (left over from something else) and the inner members are again a scrap, this time of ¾ wafer board subfloor material. I cut rabbets in the top and bottom edge of the 2x4 for the waferboard bottom and the Sandewood plywood top/bottom of upper box. The Sandewood is nominally ¾ but really 18mm. The inner side of the 2x4 also has 3/8 inch deep dados for the inner structure. My steps went something like:

1) Cut 2x4 material to length. I wanted the upper box structure to be 20 inches wide and 53 ½ long and decided to let the 2x4 extend 1 inch beyond the upper box for an outside of 22x55 ½. Joints are just glued and screwed butt joints so the front and back are 55 ½ and the two ends are 19 inches.
2) Notch the ends of the 2x4 material for the wheels. I used a Harbor Freight mobile base setup that has metal brackets to go on the corners of a 1 ½ inch thick wooden frame. For the end with the wheels that are always on the ground, there has to be a notch for the wheels. This was about 2 and ½ inches tall and 3 inches long – check these dimensions for your mobile base using the bracket and wheels.
3) Cut ½ inch deep rabbets the right depth for the waferboard bottom and the Sandewood plywood top. I used the BT and had to stop short of the end on the front and back because of the butt joints. A forstner bit and chisel work finished the rabbet on each end of the front and back (on the bottom rabbet the notch for the wheels eliminated the extra work on one end). Either make the upper rabbet extra deep on the top (like ¾ instead of ½) to allow for the back or make the 2x4 base ends about ¼ inch longer (I forgot and had to deepen the rabbet after glueing and screwing the waferboard bottom onto the base assembly – possible but not recommended).
4) Measure the distance between the rabbets in the 2x4s and this is the width of your inner members for the torsion box structure. I had to rip off a little planner stuff on the outside of the 2x4 and the inner members were about 2 3/8 inches wide. Rip enough material for the two long inner members and the 6 short inner members.
5) Cut the long and short inner members to length remembering to allow for the dados in the 2/4s (i.e. if 3/8 dados, add ¾ inch to the inside dimensions).
6) Set the dado blades for the thickness of the inner members and set the height of the dado blades to ½ the height of the inner members.
7) Clamp the long inner members together and the short inner members together. Layout the dados remembering the size you need to leave for the mobile base brackets and spacing them evenly resulting in spaces less than 8 inches square.
8) Cut the dados in the inner members. I used the sliding miter table.
9) Assemble the inner members, bottom, and 2x4 outer members. I used construction adhesive to get strength with imperfect joints and longer open time than yellow glue. I used screws at the corners of the 2x4s (which I later plugged) and screws through the bottom into the inner plys to hold things together. Put on a flat surface and weight the structure down and allow to dry overnight.
10) Cut the openings for the mobile base brackets and then finish the bottom of the base structure – you won't be seeing it again. I painted mine with exterior primer and exterior house paint. This finish won't be seen, it's mainly to avoid moisture absorption and the possibility of associated dimensional changes.
11) Attach the wheels – could be done later but it's much easier now. I did not use the brackets for the corners on the front side of the base – I think my base is solid enough and they aren't real pretty. The adjustable feet that came with the Harbor Freight mobile base had a 5/16 fine thread so I used two feet off the BT3100 base instead so I could use normal 5/16 T-nuts.
12) Cut the upper box pieces to size. I ripped enough ¾ Sandewood plywood for the 20 inch wide pieces and then cut to length. I allowed for 1/8 inch deep dados at plywood intersections. These dados are not deep enough to add significant gluing surface but help to align the pieces during assembly.
13) Adjust the width of the dado blades for the Sandewood and cut the 1/8 inch deep dados. Cut the rabbet for the top of the left hand vertical piece and the dado in the vertical piece on the

other side of the space for the BT3100 with the same rip fence setting so the lower base for the saw will be level.

14) Assemble the upper box. I used 1 5/8 inch coarse thread drywall screws through the bottom into the vertical members and pneumatic nails to attach the back. To allow maximum gluing surface for the back, I did not rabbet the box, just glue and nailed it to the back. One end was left slightly long and trimmed flush after the glue had dried.
15) Plug any visible screws (the ones up through the bottom won't show).
16) Attach the upper box structure to the base using glue and screws. Construction adhesive would be good for this but I was out so I used yellow glue. I countersunk the screws so I could hide them with plugs.
17) Sand and finish the whole structure – I used 3 to 4 coats of water based poly I wanted to get rid of. The Sandwood and luan plywood (back) really soak it up so you will use about ½ gallon of poly. You could also paint it. You do not need to sand finer than 150 grit.
18) Attach the upper base piece that the BT will be fastened to with the hole in the center to the rest of the base with hinges. These have to be recessed into the plywood to let the upper base lay flat on the lower base. Also add a couple of screw-eyes and a light guage wire to hold the saw at 90 degrees to the base when you tilt it up. The Sandeply is kind of soft so I put a scrap piece of angle iron on the edge of the upper base piece where the wire wants to cut into it (you should see this in the photos).
19) Put T-nuts into the upper plywood base at the corners for the BT and attach the upper base piece to the plywood base with hinges (so you can pivot the saw up for cleaning). I marked the location of the holes for the BT by carefully placing it on the base and centering it. I then lifted the BT3100, drilled the holes for the T-nuts into the back side of the upper base piece (use a forstner bit to sink the T-nuts below the surface). I centered the BT so that the rails hung over the base by the same distance front and back and then marked the holes for the T-nuts. This isn't absolutely necessary but it lets you make the L-shaped brackets that go under the rails to support the extension rails the same for the front and back.
20) Make the L-shaped brackets to go under the rails, finish them, clamp them to the rails to get the height right, and screw them to the uprights of the cabinet. Before you fasten them to the base, drill holes the right diameter for the tap you will use to tap threads into 1/8 inch bar stock through the horizontal member of the L-shaped brackets in the right location to be in the center of the slot on the bottom of the rail. For 5/16x18 threads use an "F" drill. My brackets were 2 ¾ inches across the top but that is determined by the distance from the cabinet uprights the brackets get screwed into to the outer portion of the rail that the bracket will support. For the rear rail, I went to the outside edge of the rail. For the front rail, you cannot go that far due to the downward sloping surface on the outer portion of the underside of the front rail so I went to the edge of the flat portion.
21) Insert the bar stock into the rails and, using the holes in the plywood for alignment, drill the bar stock. Then remove it, tap the threads and drill out the holes in the plywood to the bolt diameter. I did not drill all the way through the bar stock when it was in the rails, I just drilled enough to mark the hole location and then drilled the rest of the way with my drill press. I was concerned of hitting the rails with the drill bit when I went through the bar.
22) Now you may bolt the rails to the L-bracket. I think these L-brackets are better support for the extended rails than having legs on the extension top. They also allow the rails to be moved to different positions and the extension top can also be slid to different positions.
23) The extension table has a top of ¾ melamine covered particle board with ½ inch Sandewood plywood edging and ¼ inch luan to space the sides away from the rails so the rip fence will work. There are 4 cross supports for the top that are dadoed to the underside of the top. I also cut a 3/8 inch recess for my PC690 router and made a fence to use the extension table as a router table. There is also a box with a door that is hung from the extension table and

fastened with hanger bolts and wing nuts so I can hook up the dust collector to the router table. This collects the chips from routing operations really well eliminating a major source of stuff on the floor in my shop.

24) The extension table is supported by the inside grooves of the front and back rail very similar to the way the rails fasten to the L-shaped supports. There is flat stock in the grooves of the rail, knobs going through the Sandeply sides of the extension table and into the flat stock. Loosening the knobs allows the extension table to move. It rests on the L-shaped brackets.

25) Decide what you want in the way of drawers and construct them. I decided I want my blades in a drawer on a dowel with ¼ inch spacers between them (so the teeth don't touch). This drawer contains all my 10 inch blades, an adjustable dado, an eight inch carbide tipped stack dado (HF), and a six inch steel stack dado (Freud). There was also space for half a dozen zero clearance plates, a block with slots for the blade wrenches and a couple of combination wrenches (1/2 for the blade guard and 9/16 for the tenon jig clamp-down), a flat and #2 phillips screwdriver (in a block with slots to fit their shape) and a Kirby-like micro-adjust. The top drawer of the center compartment has more tools including 3/8, 7/16, and ½ inch quarter drive sockets with driver (effectively nut drivers), a 7/16 combination wrench, a digital caliper, dial indicator, and micrometer. It also holds the blade guard when it is not on the saw. The second drawer in this section holds flip-stops, a large drafting square to check setup, Johnson's wax, etc. I use the tall narrow opening at the outside of the base to store the fence for the router table incorporated into the extension table of the BT. There is also one drawer in this section for miscellaneous stuff (right now it holds some feather boards). The drawers are deliberately of different construction. I did this to provide an illustration of possibilities. The blade drawer is ¾ pine dovetailed together with side supports. The center section is dovetailed ½ inch Sandeply plywood, supported from underneath, with overlay fronts (on the top two drawers at the moment). The drawer in the narrow section is pneumatic nailed together ½ inch Sandewood with an overlay front. I also used different woods for the fronts both to use up scraps and to provide an illustration of what the woods look like with a clear finish. So far there are walnut, red oak, and hard maple fronts.

View of the base from the top after the wafer bottom is installed and painted and before the Sandewood is installed. Shows the Waferboard torsion box structure. (Sorry for the lack of rotation – couldn't figure out how in Word)

I tried scanning in the sketch I used for construction but it did not come out very clear. Instead, I will provide dimensions. Keep in mind that I deliberately made my BT3100 tall (about 38 inches) and if you want a more typical 36 inches, you will have to reduce the height of the sides accordingly.

The vertical member on the left side (looking from the front) is 19 5/8 tall by 20 inches deep. It has a rabbet 1/8 inch deep on the top for the lower base (the horizontal member under the BT3100). The taller vertical member on the other side of the BT3100 must have an equivalent dado at the same height so cut them with the same rip fence setting. The taller vertical members are 30 and 3/8 tall by 20 inches deep. The height is not critical. The lower base is 23 and 9/16 by 20. The upper base is 22 3/8 (also not critical, anything over 20 is OK) by 20 inches. The plywood base is 53 ½ by 20 inches. The base has locating dados (1/8 deep) for the vertical members. The location of the dado for the tall vertical member on the right side of the BT3100 must match the width of the lower base. It may be best to cut the lower base to length after cutting the dado. All of these pieces are ¾ Sandeply.

The back is 53 ½ by about 31 inches (measure the base). It is ¼ luan plywood. I cut the back about an eighth of an inch long (53 5/8) and trimmed it flush after it was glued.

The front extension rail on my saw is 34 5/8 long and the rear is 31 inches. Without shifting the rails, I can rip 58 5/8. I do not think you get a full 6 inches by shifting but I should still be able to rip around 64 inches by shifting. This is probably excessive. If you cut the rails in half, you would be able to cut 24+21 inches or 45 inches without shifting and over 50 inches with shifting. That will not give you enough overhang for the router but should otherwise work fine (and you could easily locate the router into the narrow 9 inch area of the base on the right). If you want 50 inches without shifting, cut the front rail 26 inches. You can cut the rear rail a bit less (3 and 5/8 less in length) without decreasing the rip capacity because of the way the rip fence locks. All of these dimensions assume a set-up like mine where the sliding miter table is next to the main saw table. If you put anything on the left side between the sliding table and the saw table, you will need to add the width of that extra piece to the rail lengths above to end up with the rip capacity I discuss above. Your extension table needs to match the length you cut the rails to – I made it after attaching the rails to the base and measured what I needed.

The box around the router is 7 inches wide, 14 inches tall, and 12 inches wide. I should have made it a half inch wider so I could rotate my PC690 easier for depth adjustment. The top flange which has holes for the hanger bolts is about 20 ½ wide (measure the underside of your extension table and make this flange slightly smaller).

The router fence is 22 x 11 inches. The movable portion of the fence face are 3 by 11 inches each. The fixed portion of the face is 2 by 22 inches. The hole diameter in the extension table is 3 ½ inches (so I can use panel raising bits).

A bunch of pictures follow. That makes the file large but I find other peoples pictures very helpful in understanding what they did so I tried to include enough you could get the idea of what I built.

Base for Saw showing underside. Waferboard is on and painted with openings for mobile base cut out. (Note the mess, I am not neat like Rod Kirby.)

Wheels are now attached. The base is resting on my old home-made table saw (it is my assembly table until I get around to making one). The BT3100 can be seen on the right. My INCA jointer planner in planner mode is behind the new base for the BT.

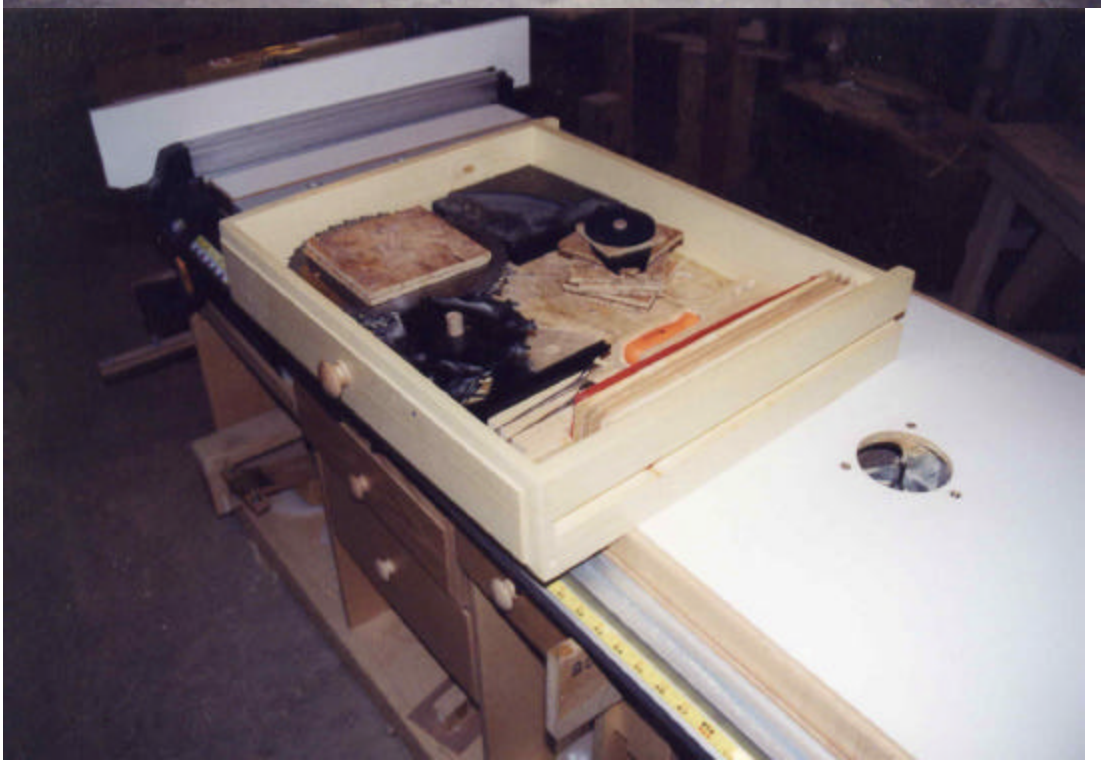
Other end of base with wheel that raises the base to move it and adjustable feet in t-nuts that support this end of base when wheel is not raised. I added ¼ inch thick pieces of scrap steel to the top surface the lever that raises the wheels pushes on (the piece that the wheel attaches to) to raise the saw more.

Front view of saw. Note the knobs below the front rail. These are for clamping the rail to the plywood L-brackets discussed in the text. You also see the box around the router on the left underneath the overhang of the extension table. The fence for the router is under the 9 inch wide drawer on the right. If you look closely, you can also see the two layers of ¾ plywood under the BT3100 (I call these the upper and lower bases).

You can't see much detail but I included this to show the dovetail joint in the Sandeply. This is the top drawer of the center compartment with the walnut front. There is a small wood block with slots to hold wrenches and nut drivers.

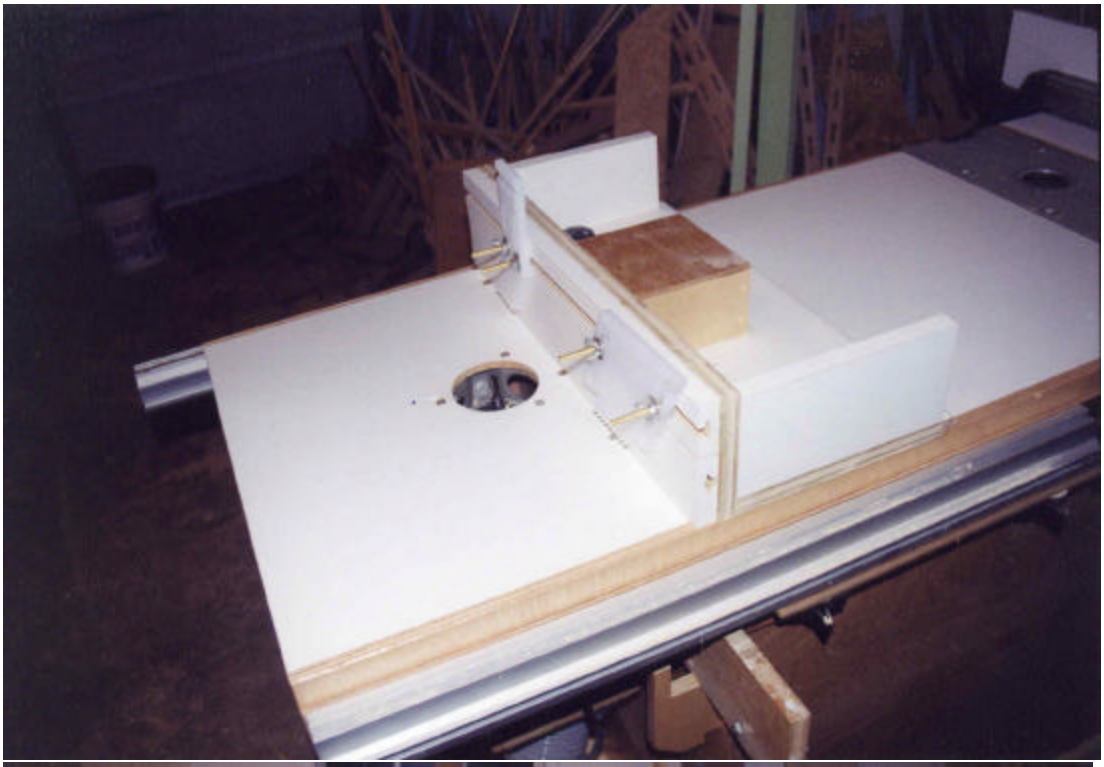
A view of the back of the saw. Note the cover over the openings in the back (ala Jim Frye). Also note the 4 knobs for the rail attachment – two on each side of the joint.

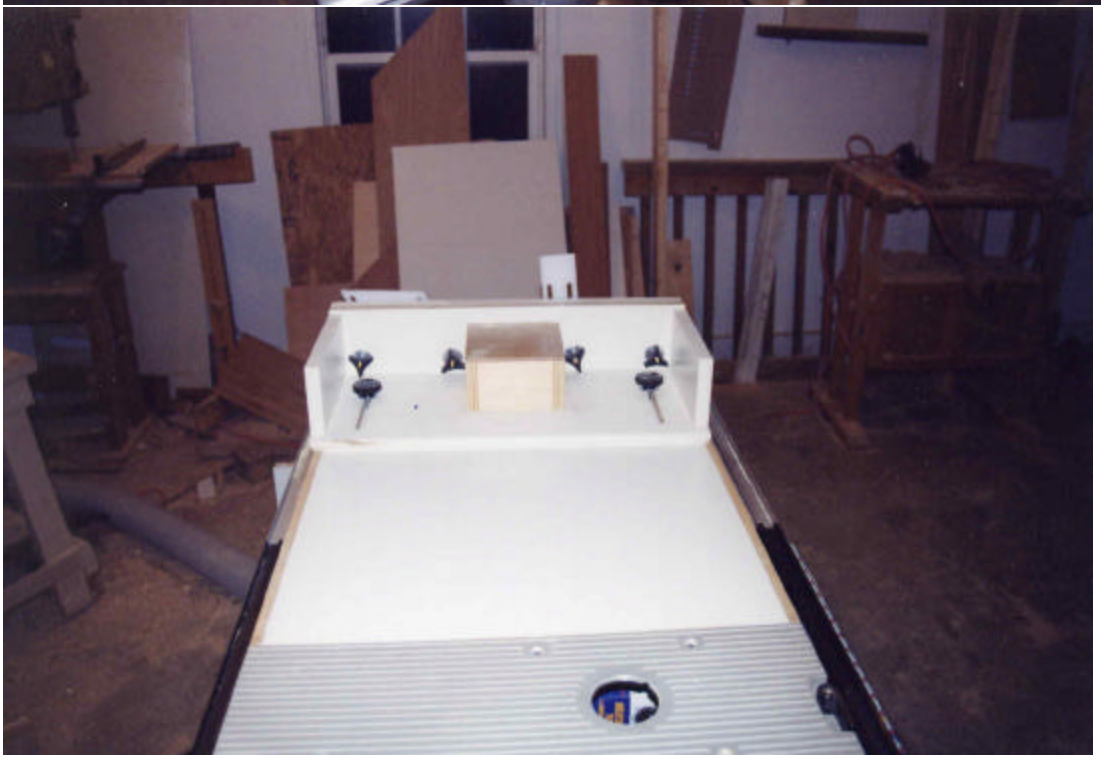
More of a closeup of the front. The jig in the center on the bottom is for cutting coping of frame and panel doors – a coping sled some mail order catalogs call it. Mine is door skin plywood and wood scraps.



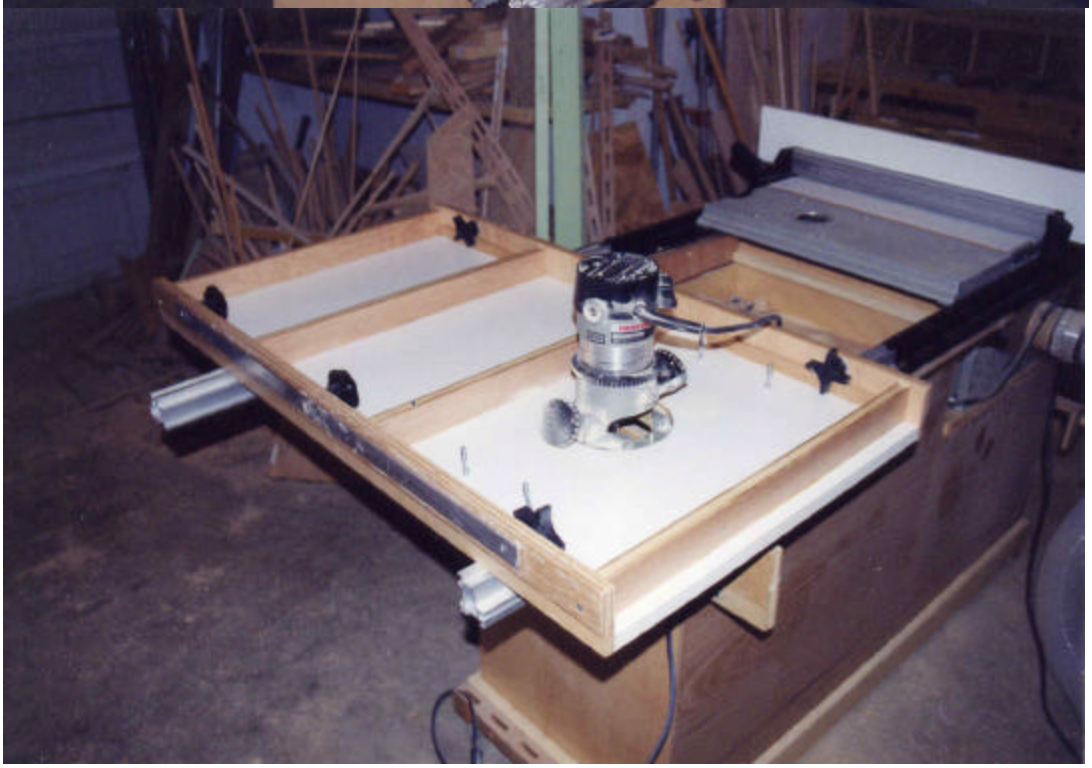
This is the blade drawer that resides under the BT3100. The bottom of this drawer is 5/8 inch thick to support the dowels. Throat plates are on the right side, wrenches and screwdrivers next then blades (including dado).

The top photo also shows evidence of the brackets I use to hold the rip fence and sliding miter fence when they are not on the saw. The visible bracket on the right at the top was my original rip fence holder. Unfortunately, I cannot use it for this with the box around the router (poor planning). It holds a sacrificial fence for the rip fence now. There is a new bracket for the rip fence on the bottom. It is oak left over from a mission style bed (it's the cut-off for the curved cut in the head-board on the piece the little spindles come through). You cannot see the brackets on the right for the sliding miter table stuff but they are just the bracket from the BT3100 base on the top and a smaller custom bracket of wood to hold a long stop that slides into the accessory fence of the sliding table (Rod Kirby design).

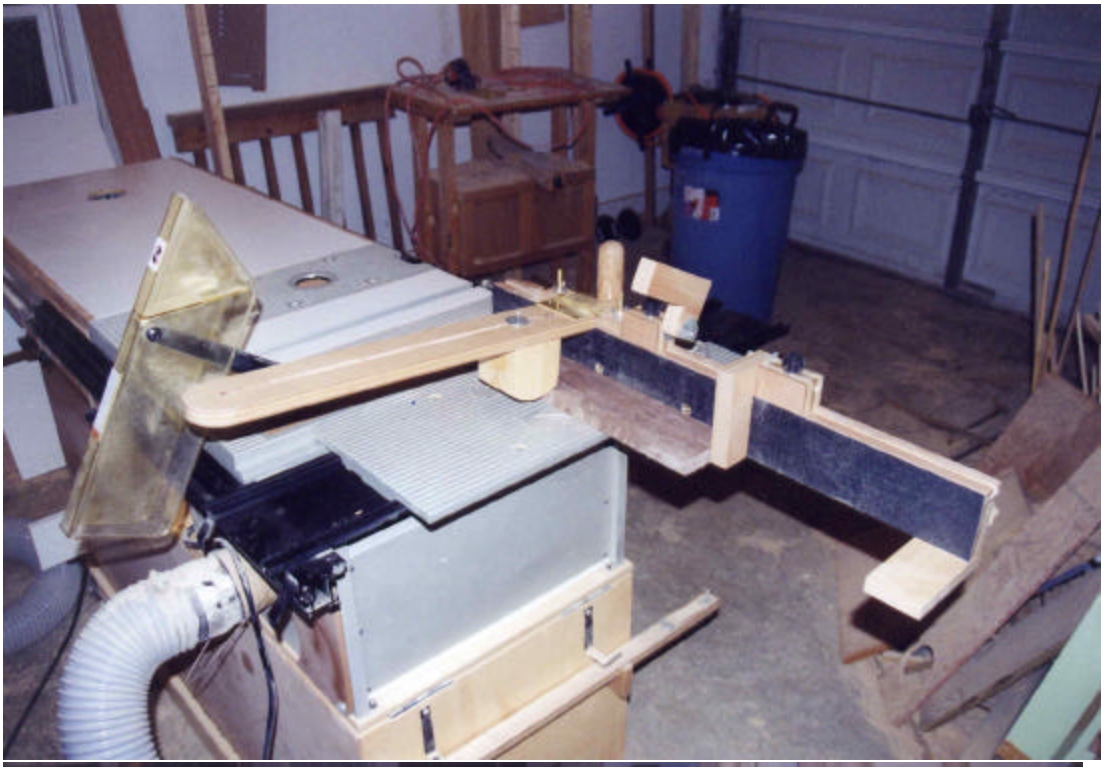




Front and back side of the router setup. On the front side (above) you can see the two t-slots. The upper one facing out is for feather boards. The bottom slot facing back is for the adjustable throat. The 4 knobs you can see on the back allow the two sides of the throat area to be adjusted for the bit you are using. The two knobs closer to the camera in the slots you see on the back are for the fence adjustment. They go into T-nuts in the extension table. The little box structure (wood colored) is for safety and dust collection (i.e. it closes off the bit opening). You can also see the fact that the front rails is a little longer than the rear in the top photograph.



The top picture shows the inside of the box surrounding the router. The switch is on the right in the aluminum housing. It controls the female plug inside the box that the router plugs into. Dust comes out the bottom. A small raised panel door has been opened to show the inside. The box is supported by the four ¼ inch hanger bolts you see in the bottom photograph. The three knobs per side that you see in the bottom photograph are to clamp the extension table to the slots on the inside of the rails. The flat bar that goes into one of the slots of the rails is visible on the near side. It is just 1/8 inch thick flat stock that has been drilled and tapped 5/16x18 to match the studs on the knobs (the studs are 1 inch long). Also note the 4 stiffeners going across the extension table and that the router is in a recess on the underside of the table.



The final pictures are of several sliding table accessories (ala Rod Kirby) in the top photo and the base open for cleaning in the bottom. Some of you have heard me mention flip-stops in posts and these are visible in the top photo. One is up in the "out-of-the-way" position and one is down for use as a stop. The covering of the fence and on the bottom of the hold-down is left over tape sold to make slip resistant surfaces on boats and boat trailers. If you look close in the bottom photo you can see the flat bar in the front that is normally within the front BT3100 rail to clamp it down. To tilt the saw up I have slid the rails off the flat bar. I slide it back onto the bar and tighten the knobs to fasten it in position for use. The extension table is also off in this photograph. The extension rails are in position, however, still clamped to the L-shaped pieces of the base. That makes it easy to slide things back into their normal position.