A First Project: Surfacing Your Table

One of the first things you'll want to do after getting your ShopBot together and running is to smooth your work surface. Here are a set of general procedures for surfacing your table. There are several ShopBot Commands you will learn about in the process …

You will want to make sure that you followed the instructions to square up your Z axis before you start. The smoothness of the surfacing you do will depend on the Z axis being perpendicular to the table. However, don't be too disappointed if your surface has distinct tooling marks. After you've finished this surfacing, you will actually be able to adjust the Z axis with even more precision because you will have a tool-defined, flat plane to measure against. The larger diameter the cutter that you use for surfacing, the less time it will take. But a wider cutter makes it more likely that you will have tooling ridges from the process and increases the load on your router. A .75"- 1.25" diameter bit will probably work well.

This little project is going to generate **a lot of sawdust**. We'd recommend you get your dust collector hooked up and running before starting the actual cutting.

The instructions use values appropriate for a table that is exactly 96" X 48". If your ShopBot is a different size, the table surface slightly larger or smaller, or you are working in mm, just replace the '96' and '48' with appropriate dimensions for your table (for example '32' and '24' for a BT32"Buddy"). *NOTE: If you are using a router bit that does not have a blade for plunging, you need to plunge to the cutting depth outside of the material, and move into the material. The instructions will give you suggestions on how to do this*.

By this point you should have the table surface material mounted on your ShopBot. You should have attached the support board to the table with the carriage bolts (recessed) included in the table hardware. Now, attach a sacrificial board to the underlying support board by countersinking drywall screws. If you can find them, plastic screws countersunk are a good option. If there are warps in the sacrificial board, check to be sure that all the screws are tight.

The table surfacing routine will use the Cut Rectangle **[CR]** Command (with pocketing) in the ShopBot Software to run a surfacing bit over the entire surface of the sacrificial board.

Remember: The **[Esc]** key will back you out of a command that you don't want. Hitting the **Spacebar or the "S"** key (and Remote Stop on a PRSstandard) will stop the movement of the carriages without shutting down power to the router or spindle. The E-Stop on a PRSalpha will stop movement of the carriages AND shut down power to the spindle/router.

Follow the steps for surfacing your table starting on the next page.

How to Surface the Table

1. Set the diameter for the bit you are using with **[VC]** (Value Cutter)

2. Move the router bit to the starting point for the X and Y axes at the **lower left corner** of the table. Call up the keyboard control **[SK]** (Set Keyboard or just **K**). Use your keyboard arrow keys to move the router into the lower left hand corner of the table (think of the little man). Carefully line up the center of the bit with the corner of the table. *Note: if you are using a bit with no plunge capabilities, move the bit to slightly beyond the material so that the bit plunges outside the material, and moves into the material to cut.*

3. Make that point 0,0 for the X and Y axes
   [Z2] (Zero 2D)

4. Lower the router bit onto the surface of the board.
   Call up the keyboard control **[SK]** or **[K].** Use the PageUp and PageDown keys to raise and lower the Z axis/router … move the bit down until it would just touch the table. **Esc**ape out of Keyboard Control.

5. Set the surface as 0 for the Z axis
   [ZZ] (Zero the Z)

6. Raise the bit so that it is about ¼" off the surface of the table
   Call up the keyboard control **[SK]** or **[K].** Use the PageUp and PageDown keys to raise and lower the Z axis/router. [**Esc**ape]

7. Send the router across the table diagonally. Watch carefully for the low point on the surface of the board.
   [M2] 96, 48 to Move in 2 Dimensions (the X & Y) to the point that is 96" along the X axis and 48" along the Y axis.[hit Enter to initiate the move] The router should glide along a diagonal line and end up at the upper right corner of the table board. **NOTE: the space after the M2 and the COMMA are very important.**

8. Send the router to the lower right corner of the table.
   [M2] 96, 0 to Move 2 Dimensions (the X & Y) to the point that is 96" along the X axis and 0" along the Y axis [hit Enter to move]

9. Send the router across the other diagonal. Watch carefully for the low point on the surface of the board.
   [M2] 0, 48 to Move 2 Dimensions (the X & Y) to the point that is 0" along the X axis and 48" along the Y axis **[Enter].** The router should glide along a diagonal line and end up at the upper left corner of the table board.

10. Move the router to what looks like the lowest area of the table surface.
    Again call up the keyboard arrow key controls **[SK]** or **[K]** to move to the lowest point.

11. Lower the Z to that point.
    [K] and PageDown. **Read the Z location on the screen** on the ShopBot Position screen (red)… it should be a negative number if this point is lower than your original start point.

12. Zero the Z axis to reflect this new lowest point
    [ZZ]

13. Raise the Z and Jog Home to 0,0
    [JH] This command automatically pulls the Z up and moves you at jog speed back to the home location in X and Y.

14. Now you are ready to try the diagonals with the router on to see if the cutting head is at the right height to remove a small bit of material from the entire surface.
    TURN ON THE ROUTER/SPINDLE. For PRSalpha Alt -1 to Activate; then hit Start Button.

15. [MZ] 0 to Move the Z to 0.

16. [M2] 96,48 [Enter] will Send router across diagonal to the point 96, 48 (You may have to add an inch to the length or width if you plunge outside the material.)

17. If the cutter removes a bit of material from all across the diagonal, you are at the right Z height. If not, lower the Z slightly and return to 0,0 [M2 0,0] You should confirm your final height by cutting the other diagonal … you've done this before, right ?

18. Go back to home after getting the depth set with diagonal passes.
    [JH]

19. Now, you are ready to surface the table.
    NOTE: You may want to try this up in the air first before you really cut the surface, (you can do a few passes to mare sure all is going right, then stop the action with the space bar, jog home [JH], and start over … you can also try this in Preview Mode first)
    [CR] for Cut Rectangle.

20. Fill in the blanks on the parameter sheet.
    a. For a PRS96, the values would be Length x 96, length y 48, T (for True),
    b. 1 (direction of cut=clockwise)
    c. Start* 4, *set to 4 to start in bottom left
    d. Plunge per pass (set depth slightly below predetermined lowest point on table to be surfaced, say -.025), Reps 1.

21. Use the tab keys to move between rows of options.
    a. Set Pocket function by marking box [X] with the spacebar.
    b. Set "Z Plunge Offset 0" by checking box with spacebar.
    c. Accept [Enter] then [Enter] again to run it.

YOU'RE OFF AND RUNNING ….

There is also a Table Surfacing Tool in the ShopBot Software under Tools. This is a simplified version of what you've just done and will be useful for routine re-surfacings of your table.