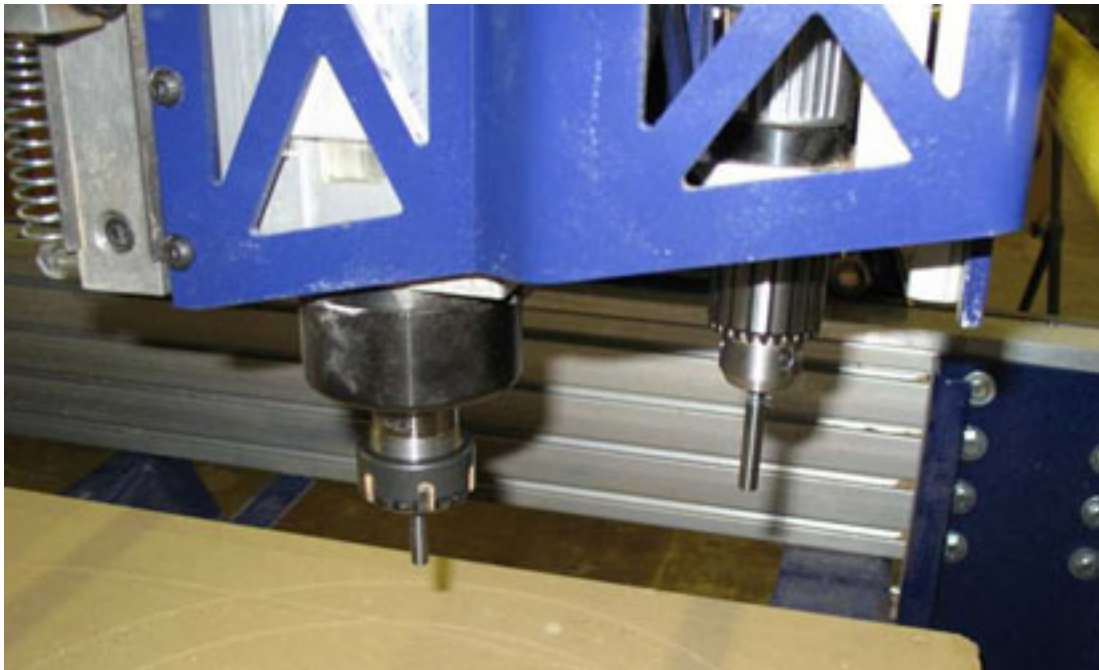


## Finding Offsets for Multiple Spindles/Air Drills





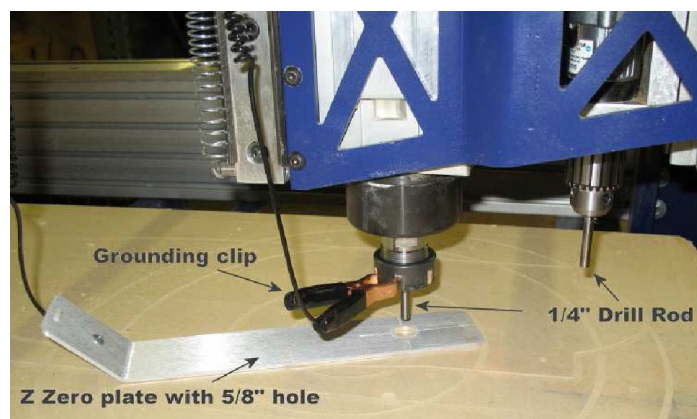
## Introduction

This document explains how to determine the distances between the cutting heads (including drills, routers and spindles) – the distance one is offset from the main spindle position. When centering routine is completed for all cutting heads, offsets are saved in the my\_variables.sbc file in the ShopBot directory and is available when referenced in ShopBot Part files that make use of multiple cutting heads.

## Items Required

- Z zero plate with clean 5/8" hole already cut. The plate should be connected to input #1.
- Drill rods. 1/4" x 2-3" long. One for each cutting head.
- Clamps or duct tape to attach the plate to the table.

## Instruction



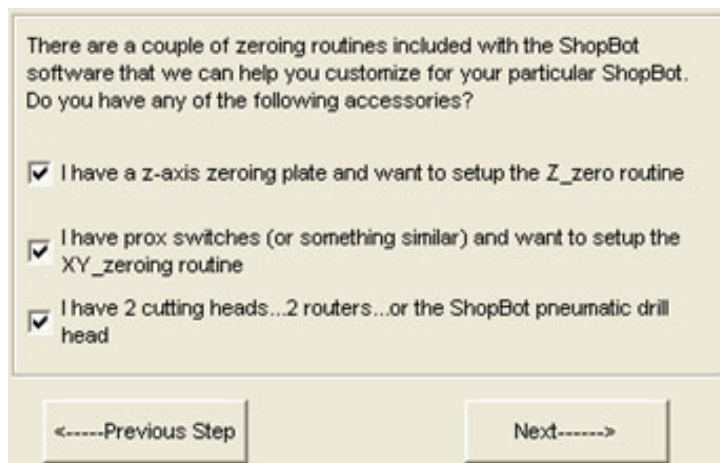
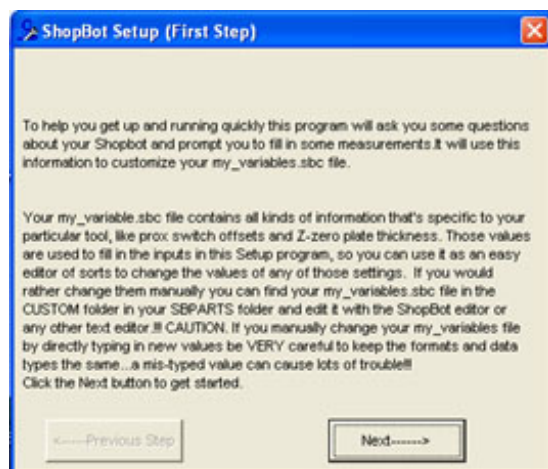
Put a 1/4" drill rod into each cutting head. Zero the Z (and A-axis) spindle(s) with Zzero.sbp (C2)(or Azero.sbp) to the table surface.

Attach the Z Zero clip (ground) to the spindle's collet or drill chuck. Test the connection by tapping the Z Zero plate to the bottom of the 1/4" drill rod.

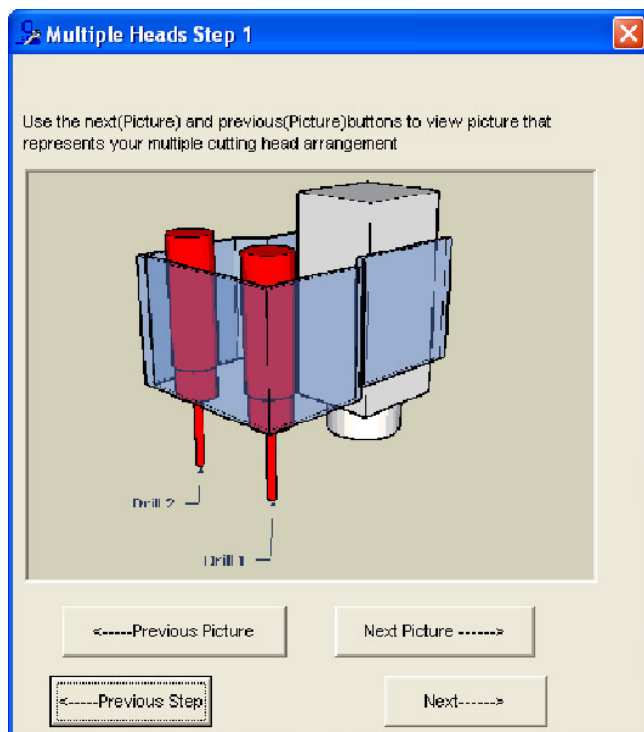
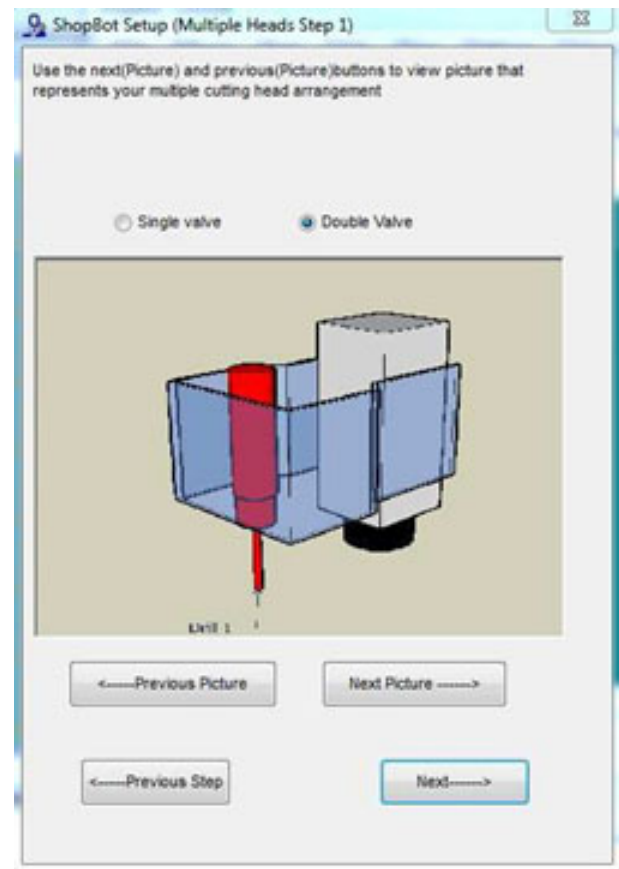
Input #1 light should come on (If the light does not come on, see Z Zero instructions for testing and connecting centering plate).

Securely attach Z Zero plate to the table with clamps or duct tape. Do not move the plate until all cutting heads have been calibrated. Movement in the Z zero plate during this process will introduce errors in head offsets.

Open Tools ShopBot Setup (TS) in the ShopBot Control software (V3.5.4 or higher) and start the routine. When the routine starts, it will give some general information about the file. Click next. At the bottom of the next screen, check all common accessories that apply to the machine. Make sure that the last selection is checked - I have 2 cutter heads... pneumatic drill heads. Click next. The next two screens concern the Z zero plate and Prox switches. Fill in if necessary then click next.

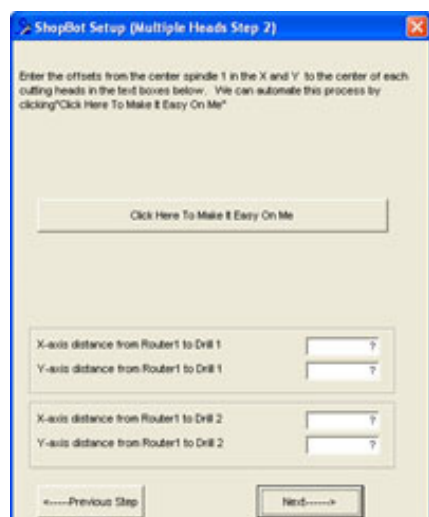


Select whether the air drill is a single valve (shipped prior to Jan 2011) or double valve unit.

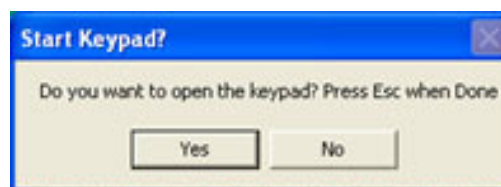
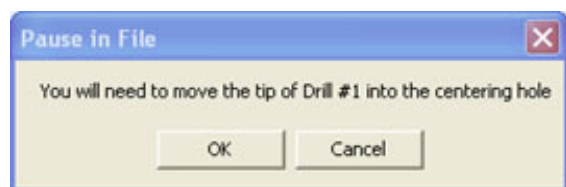


In the Multiple Heads Step 1 screen, select the picture that most closely matches the number of cutting heads and air drills on the ShopBot and click next.

In the ShopBot Setup (Multiple Heads Step 2) window, there should be an X & Y offset location for each additional cutter/drill. Click the Make It Easy On Me button in the middle of this screen. The Cutter Offset Setup window will open and describe what is needed during the file. Click Get Offsets.



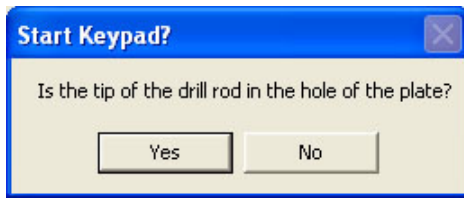
Follow the directions on the software. Center spindle #1 and click OK. If the drill rod is not in the center of the hole in the Z Zero plate, use the KeyPad to position it by clicking Yes when asked. Press Esc to close KeyPad and continue.



Use the arrow keys to move the primary head over the hole in the plate and then down into the hole. Be careful not to touch the table. This could cause the drill rod to drag and possibly give a misreading or loss of position. When the drill rod is in the hole, hit Esc.



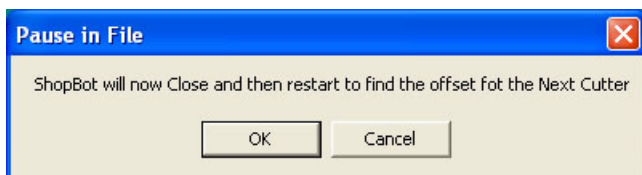
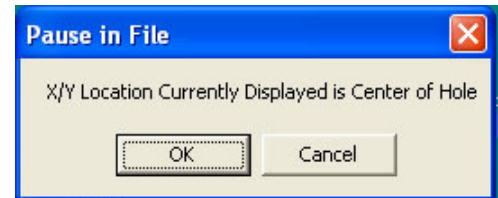




The KeyPad will close and a confirmation window will ask if the drill rod is in the hole of the plate. Click Yes if this is true and the centering routine will start. The 1/4" drill rod will start moving in the positive X direction and touch the plate. The 1/4" drill rod will move in the negative X direction and touch the plate. This will center the drill rod in the X-axis. The routine will continue in the

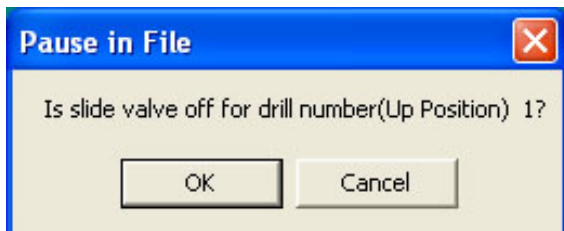
Y-axis. Once the X and Y have touched the plate, the tool will move to the center of the hole and move the Z-axis out of the hole. This gives a starting point to calculate the offsets for the additional cutting heads.

When the primary cutting head has pulled up a window will open stating that the current XY location is the center of the hole. This information will be stored within the my\_variables.sbc file automatically at the end of the file. This window only calls out attention to the user of the current location.



When the spindle has finished centering, the software will shut down the SB control software and then restart to find the offset of the next cutter.

**Note:** The software may continue on to center a second spindle. For purposes of this document, the single spindle two air drill configuration will be reflected.

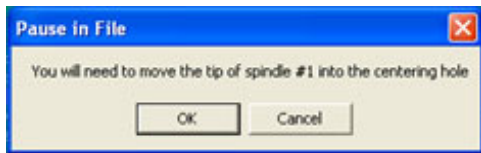


When the SB control software reopens the software will prompt the user on the next cutter or drill to be centered.

**WARNING:** Pay close attention to the following instructions. Failure to do so may cause bodily harm.

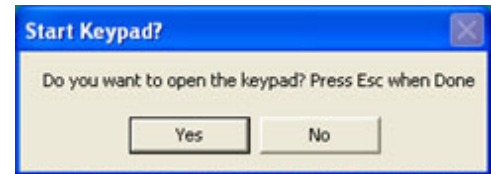
If the drill is to be centered it will raise the Z-axis up to a height of six inches and prompt the user, asking if the slide valve of a particular air drill is off (Up Position). Confirm the slide valve is in the up position. Make sure that all hands, material, clothing, etc. are out of the way, and click OK - the file will trigger the corresponding air drill's solenoid, which will allow it to lower.





Move the appropriate drill # into the centering hole and click OK.

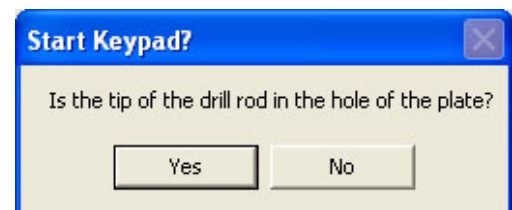
If the drill rod is not in the center of the Z zero plate hole, use the KeyPad to position it by clicking Yes when asked. Press Esc to close KeyPad and continue.



Use the arrow keys to move the primary head over the hole in the plate and then down into the hole. Be careful not to touch the table - this could cause the drill rod to drag and possibly give a misreading or loss of position. When the drill rod is in the hole, hit Esc.

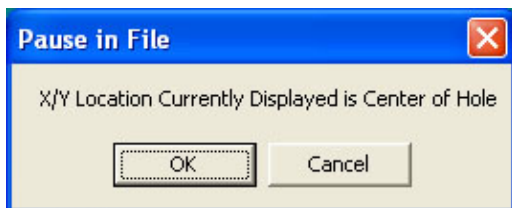


Click Yes to confirm whether the drill rod is in the hole of the plate.

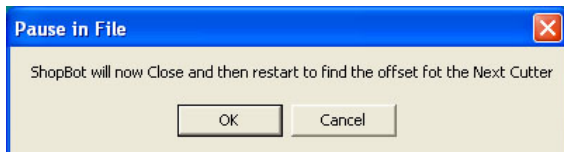


The 1/4" drill rod will first move in the positive X direction and touch the plate, then into the negative X direction and touch the plate, centering the drill rod in the X-axis. The process will repeat for the Y-axis.

Once the X and Y have touched the plate, the tool will move to the center of the hole and move the Z-axis out of the hole.



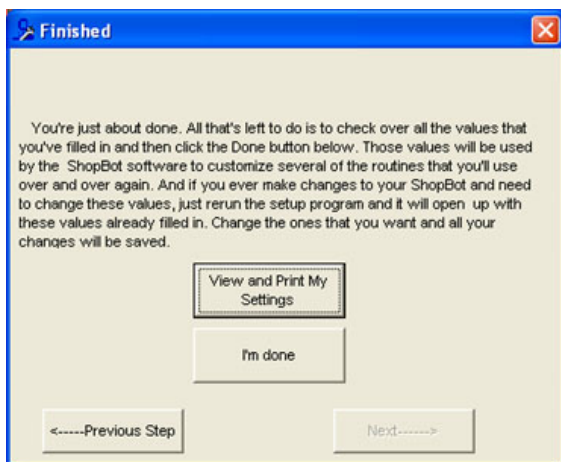
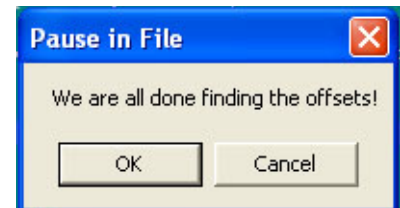
When the designated drill has pulled up, a window will open stating that the current XY location is the center of the hole. This information will be stored within the my\_variables.sbc file automatically at the end of the file.



When the appropriate drill has finished centering, the software will shut down the SB control software and then restart to find the offset of the next cutter.

Note: This document used the single spindle two air drill configuration, so the previous drill centering prompts would have continued for the second air drill.

When the window prompts that the file is done, click OK.



The file will return to Tools Setting (TS) file where the user has the option of exiting (I'm done) or viewing and printing the settings for a backup.

**Note:** The offsets found throughout this routine are not saved to the my\_variables.sbc until the (I'm done) button is clicked.

