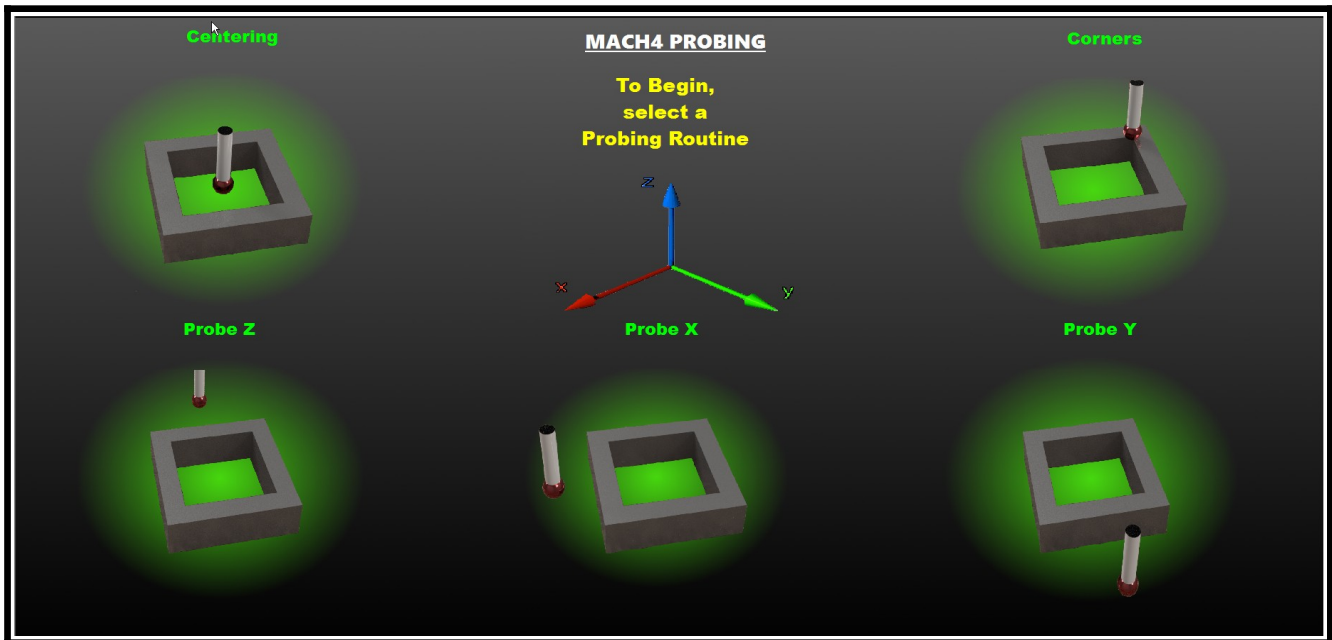
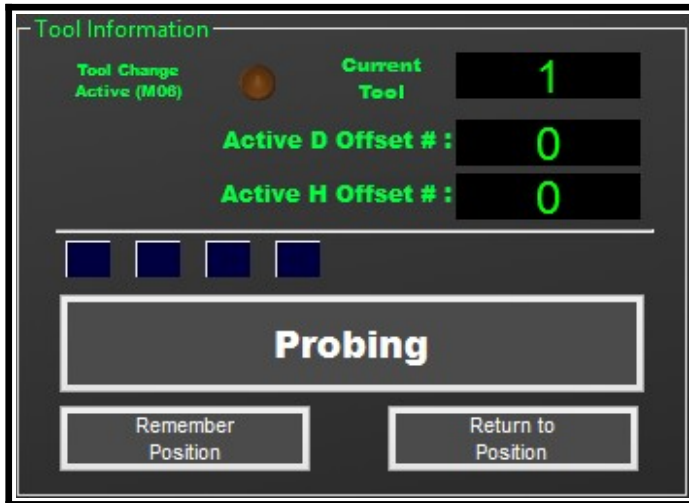


# Mach4 Hobby Probing

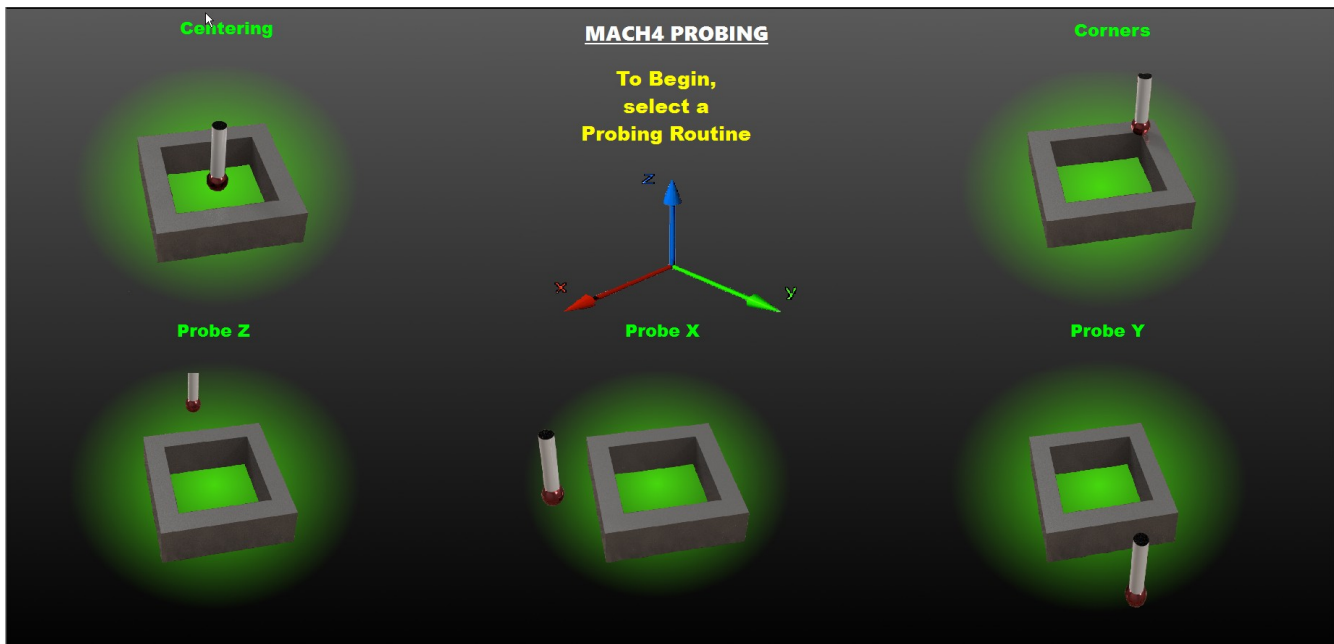


This document will cover probing and its routines in Mach4 Hobby.



Mach4 Hobby Probing can be launched from the "Probing" button in the Tool Information Group, or as a Wizard. The Probing facility will launch as a GUIR "remote screen."

Once probe has launched the Probing home page will be visible.

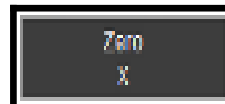


Each image is a button that will start the process as stated in the label above the button. When a process is selected, step by step guided screen instruction will aid in completing it. Once any of the processes are chosen, the bottom portion of the screen will contain “Probe Control” Group.



The set of DRO's on the left of the Probe Control display the current work coordinates. The associated Axis for each dro can be found just to the left of the dro its self.

To the left of the Axis labels are Buttons to set the work coordinates for each of of the axis to Zero.



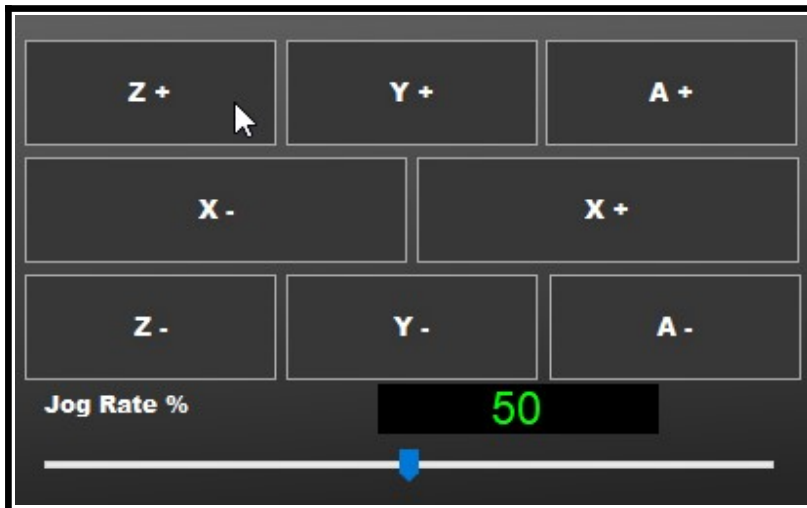


Just to the right of the Current Work Coordinates DRO's, the Probe Home Page can be found. Click on this Button at anytime will exit the current probe process and return The probe facility back to the Probe home page.

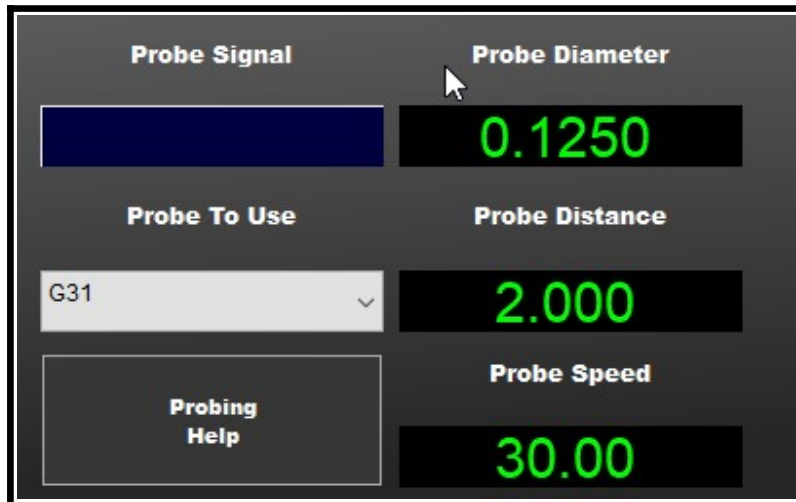
| Relative Coordinates |   |        |
|----------------------|---|--------|
| Zero Rel X           | X | 0.0000 |
| Zero Rel Y           | Y | 0.0000 |
| Zero Rel Z           | Z | 0.0000 |
| Zero Rel A           | A | 0.0000 |

The set of DRO's to the right of the Probe Home Page Button, are Relative Coordinates. These dro's do not represent any work or machine coordinates. However they do have Axis designations like Current Work Coordinates Dros, and also Zero Axis buttons, they represent they will represent their associated Axis relative

to the current work coordinates. These dro's can be used for reference or as a measuring tool between entities. This process will be discussed later in this document.



Right of the Relative dro's There are a set of axis jogging buttons. The Jog buttons perform the same action as the jog buttons on the main hobby page. They will follow continuous or incremental jog types as well. Below the Jog buttons, a jog rate percentage dro exists. This dro can be adjusted by entering values into it, or it will update via the slider underneath it.

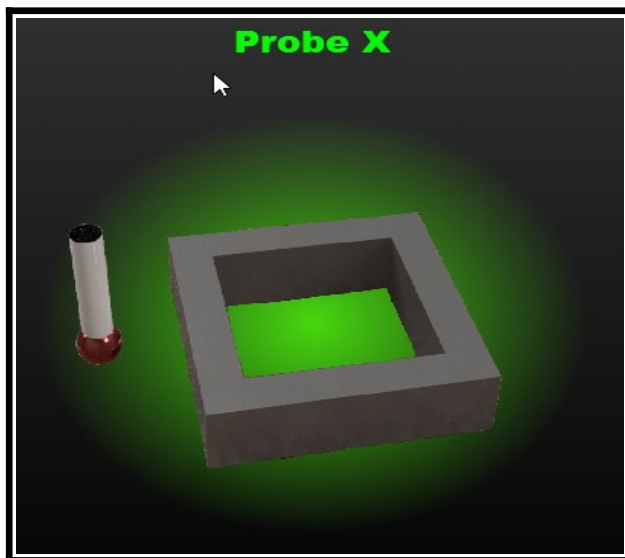


On the right of the Probe control group are settings to probing routines, probe selections, help, or probe Led.

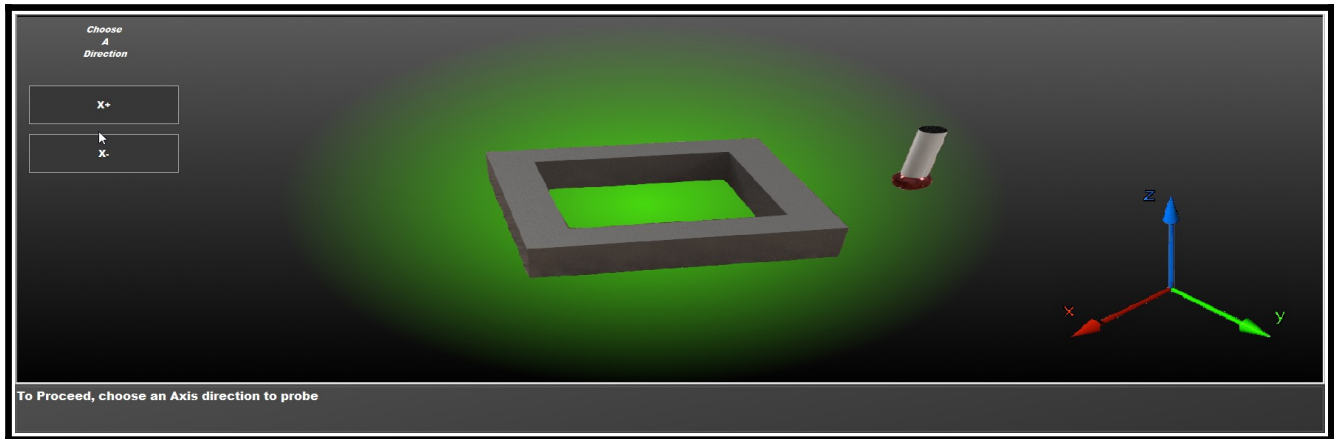
The probe signal Led is assigned to the probe signal and will light up when a probe strike occurs. Probe to use drop down menu is a selection drop down for choosing to correct probe signal mapped in Mach4.

Probing Help Button will launch this document for assistance with probing routines and settings. Probe Diameter dro is where the diameter of the tip of the probe will be entered. Probe Distance is the distance the axis will travel during a probe routine. If a probe strike does not occur within this distance, the distance should be altered, or the probe signal should be checked. Probe Speed is the units per minute that the probe will travel towards a surface.

The first Probe Process that will be discussed will be Probe X.



Once Probe X has been selected, Probing will navigate to X probing Page.

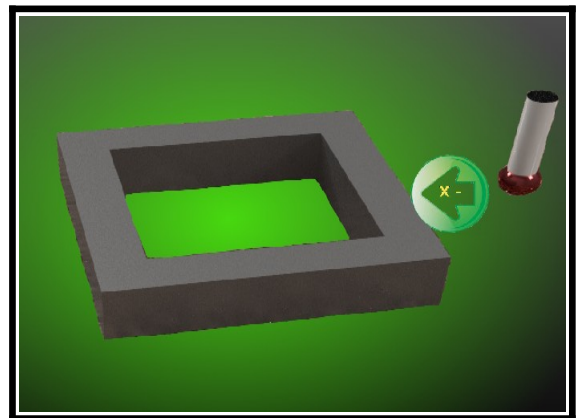
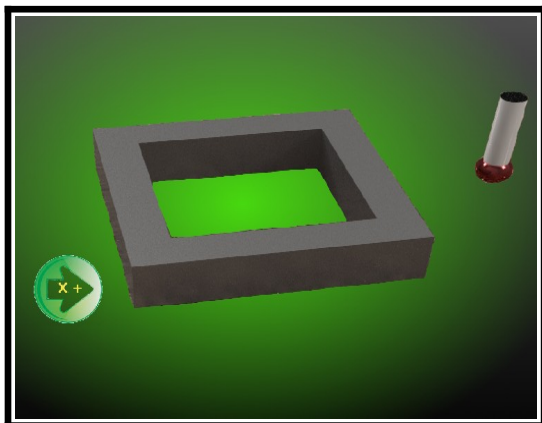


Once inside X probe facility, There will be a prompt in the upper left corner of the screen to choose an X direct to probe. “Next Step” direction will be viable in the dialogue box under every Probing facility.



An appropriate direction should be chosen at this time.

Clicking on either of the Probe Direction buttons will place a start probe button on the screen that represents the direction to begin the Probe move.



The images above, depict the start probing buttons based on the direction button selected after first entering the X Probe page. X+, and X-

Prior to clicking on the available probe direction button, Axis(s) should be jogged into position to probe the desired surface.

If X+ is selected, Probing will immediately begin in the X positive direction. Similarly in the negative direction.

Once a direction button for X is pressed, Probing in the selected direction will start. If a successful probe strike occurs within the probe distance, the Probe will retract back to the position it was at when probing began.

When the retract process is complete, the Z clearance page will be present. This is an opportunity if necessary, to jog the Z axis to a safe clearance position for moving over the probed entity.

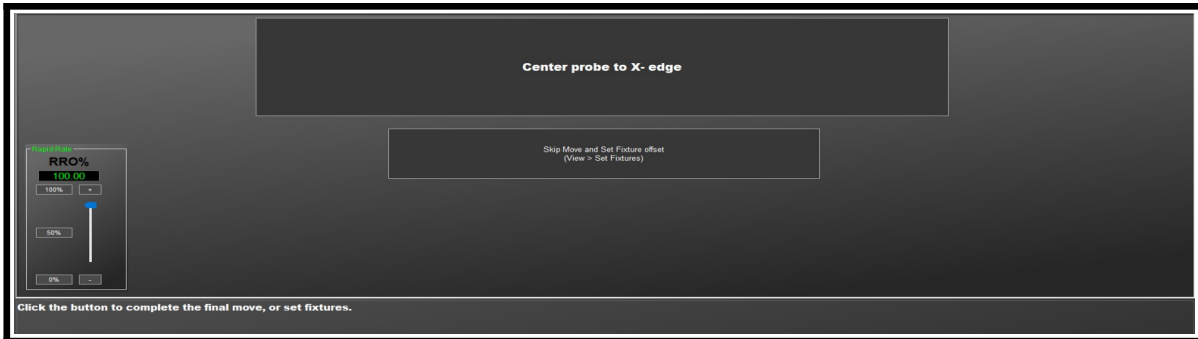


There are two Z jog buttons. One positive, and one negative, for jogging Z away from any obstructions. The dialog box has directions to do so at this time.

If the Z Axis is in an appropriate position, it is safe to move on and click the OK Next Page Button.



OK Next Page Button, will advance to “Final Move / Set Fixtures page.



There is a Rapid Rate Override at the bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.

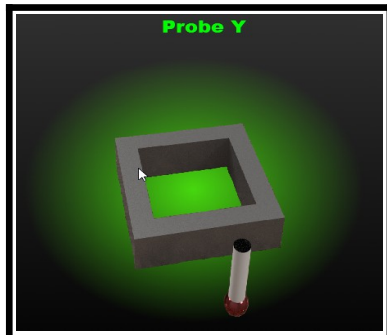
Two buttons on this page will complete Probe X.



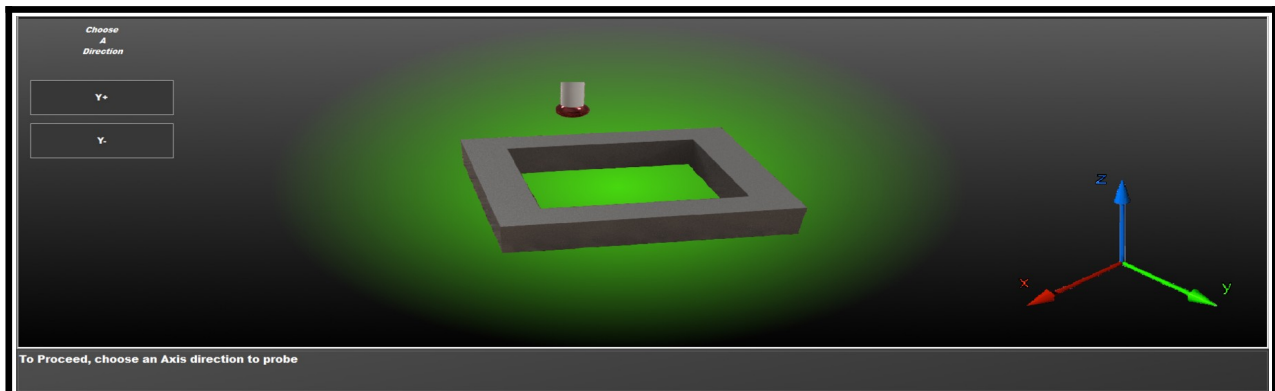
Center Probe X-, or X+ edge Button, will Move the Axis(s) over the center of the probed entity. Once the move is complete the Axis work Coordinates can be set at this time. If moving the probe over the probed entity after probing cannot be done, using the Skip Move and set Fixture offset button can be used to set the fixture offset for the probed entity without executing the centering move.



This completes X Axis probing. Click on “Probe Home Page”, to probe another entity or simply return to the Main Run screen to start the Machining process.



Y Probe Process is executed as X is.



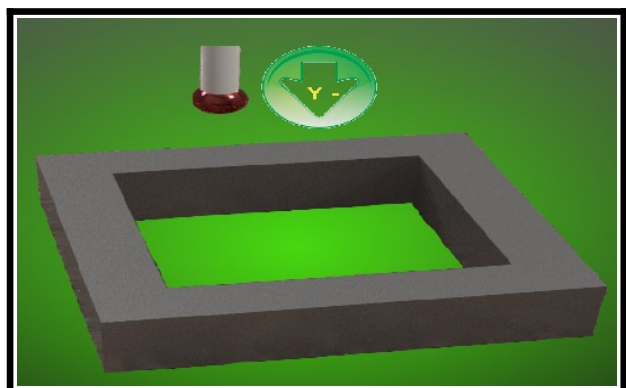
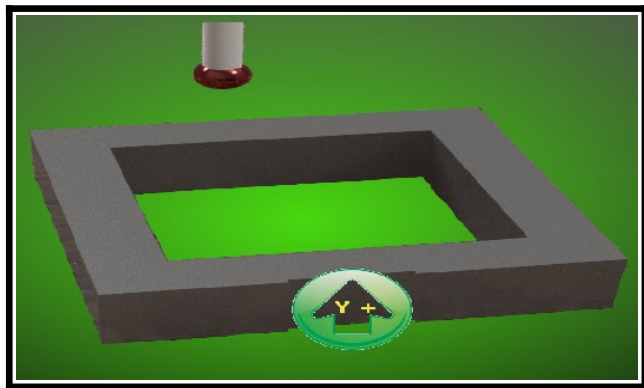


Once Probe Y has been selected, Probing will navigate to Y probing Page.



Once inside Y probe facility, There will be a prompt in the upper left corner of the screen to choose an Y direction to probe. “Next Step” direction will be viable in the dialogue box under every Probing facility.

An appropriate direction should be chosen at this time.



Clicking on either of the Probe Direction buttons will place a start probe button on the screen that represents the direction to begin the Probe move.  
The images above, depict the start probing buttons based on the direction button selected after first entering the Y Probe page. Y+, and Y-

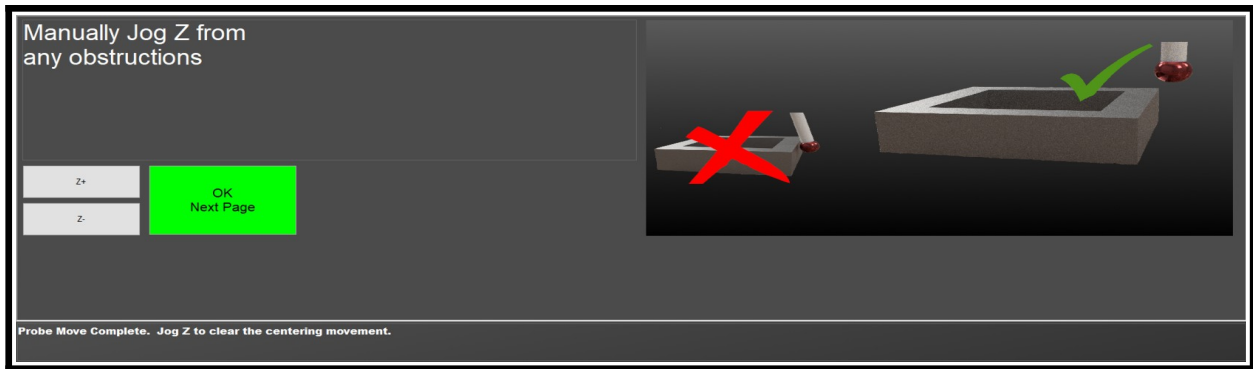
Prior to clicking on the available probe direction button, Axis(s) should be jogged into position to probe the desired surface.

If Y+ is selected, Probing will immediately begin in the Y positive direction. Similarly in the negative direction.

Once a direction button for Y is pressed, Probing in the selected direction will start. If a successful probe strike occurs within the probe distance, the Probe will retract back to the position it was at when probing began.



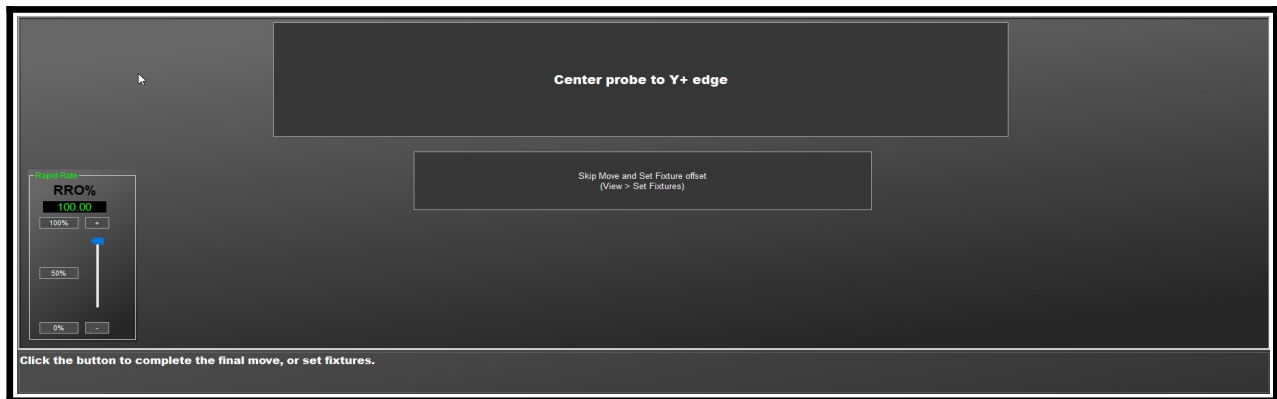
When the retract process is complete, the Z clearance page will be present. This is an opportunity if necessary, to jog the Z axis to a safe clearance position for moving over the probed entity.



There are two Z jog buttons. One positive, and one negative, for jogging Z away from any obstructions. The dialog box has directions to do so at this time. If the Z Axis is in an appropriate position, it is safe to move on and click the OK Next Page Button.

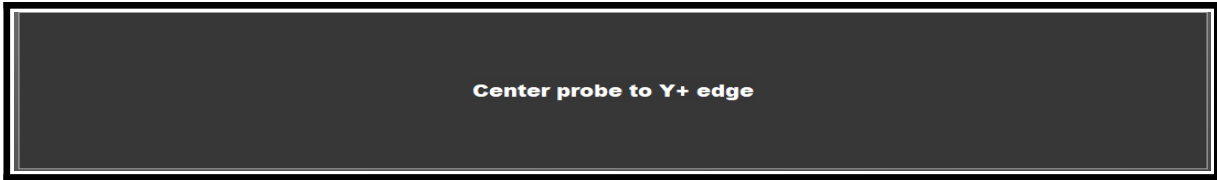


OK Next Page Button, will advance to “Final Move / Set Fixtures page.



There is a Rapid Rate Override at the bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.

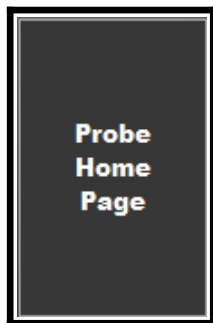
Two buttons on this page will complete Probe Y.

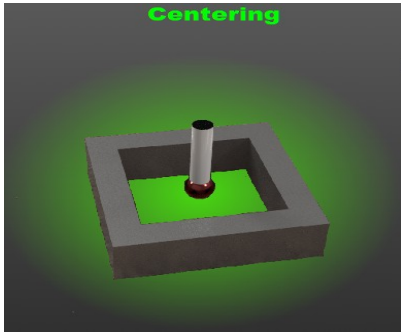


Center Probe Y-, or Y+ edge Button, will Move the Axis(s) over the center of the probed entity. Once the move is complete the Axis work Coordinates can be set at this time. If moving the probe over the probed entity after probing cannot be done, using the Skip Move and set Fixture offset button can be used to set the fixture offset for the probed entity without executing the centering move.



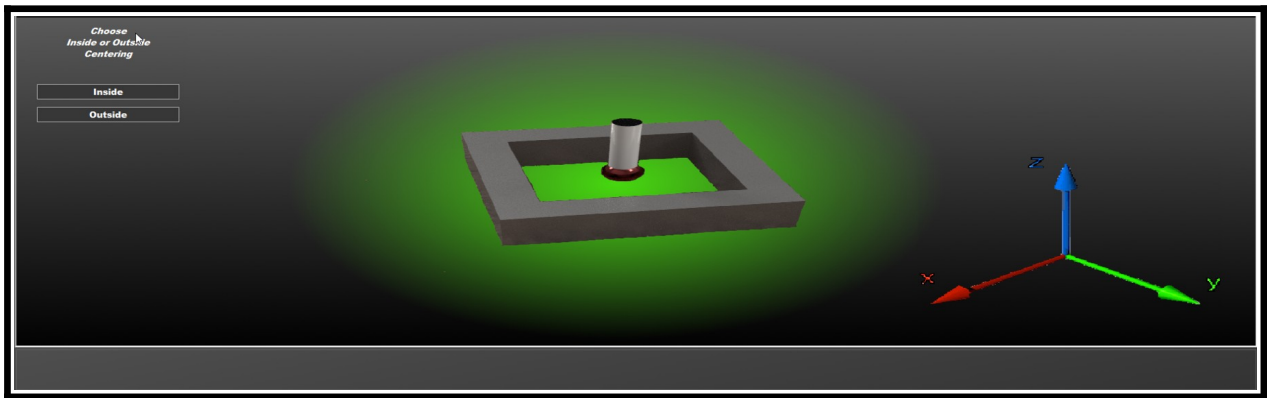
This completes Y Axis probing. Click on “Probe Home Page”, to probe another entity or simply return to the Main Run screen to start the Machining process.



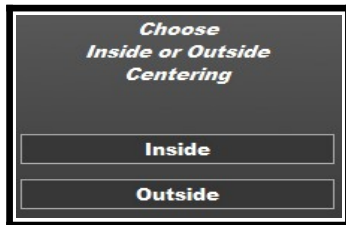


Centering will be discussed in this section.

Once Centering has been selected, Probing will navigate to Centering Page.

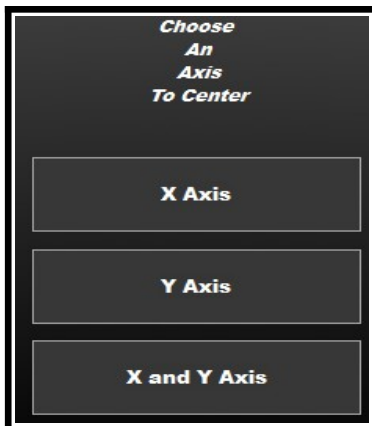


Once inside the Centering facility, There will be a prompt in the upper left corner of the screen to choose a side to probe. “Next Step” direction will be viable in the dialogue box under every Probing facility.



An appropriate direction should be chosen at this time.

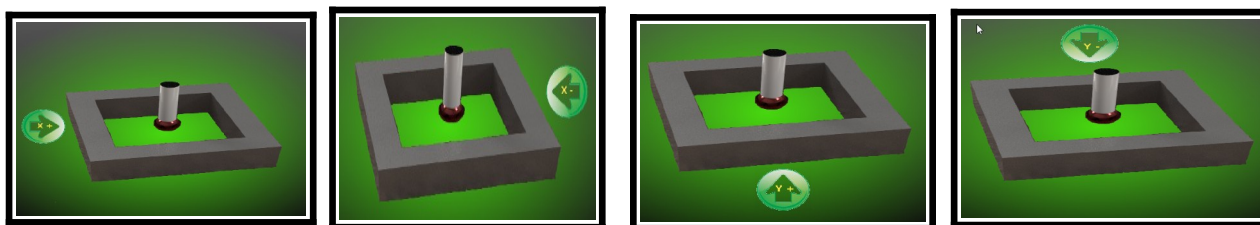
After selecting either “Inside”, or “Outside” Centering, there will be another set of choices that will need to be chosen from. They are X Axis, Y Axis, and X and Y Axis.



These are the Axis(s) that will be centered in this probing cycle.

Outside Centering has been selected.

The images above, depict the sequence of probing directions and the Image buttons as they appear. Extreme caution must be used during Outside centering. Z Must be manually jogged to a clearance plane, X and or Y Jogged into position to probe the opposing outside surface, and Z jogged to a height that will result in a successful probe strike. Direction for each of these steps will show up in the direction dialogue box.



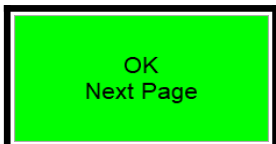
Once an Axis direction button is pressed, Probing in the selected direction will start. If a successful probe strike occurs within the probe distance, the Probe will retract back to the position it was at when probing began.

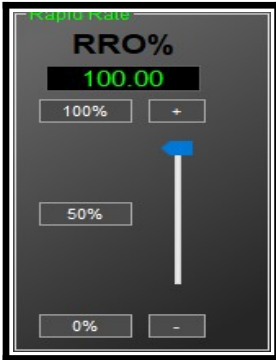
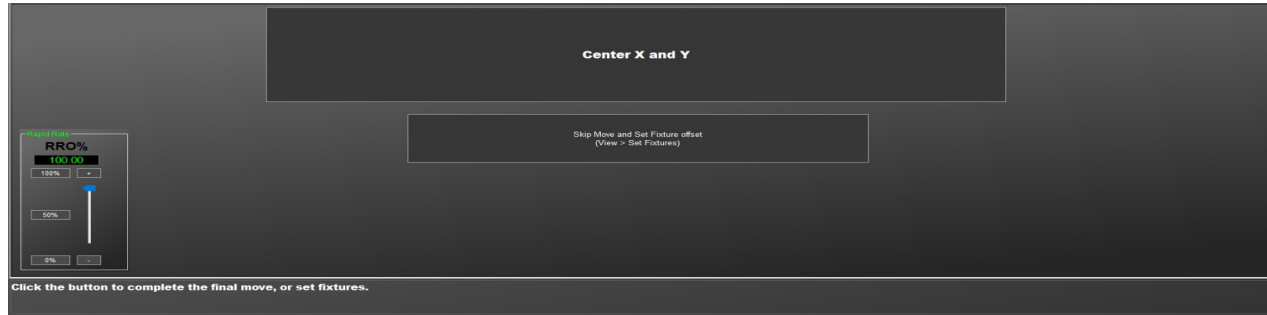
When Outside Centering is complete, the Z clearance page will be present. This is an opportunity if necessary, to jog the Z axis to a safe clearance position for moving over the probed entity.



There are two Z jog buttons. One positive, and one negative, for jogging Z away from any obstructions. The dialog box will display directions to do so at this time. If the Z Axis is in an appropriate position, it is safe to move on and click the OK Next Page Button.

OK Next Page Button, will advance to “Final Move / Set Fixtures page.





There is a Rapid Rate Override at the bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.

Two buttons on this page will complete Centering.

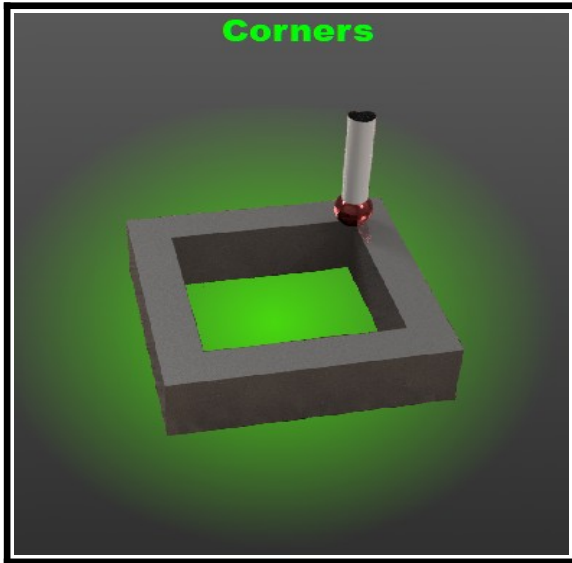


Center X and Y Button, will Move the Axis(s) over the center of the probed entity. Once the move is complete the Axis work Coordinates can be set at this time. If moving the probe over the probed entity after probing cannot be done, using the Skip Move and set Fixture offset button can be used to set the fixture offset for the probed entity without executing the centering move.

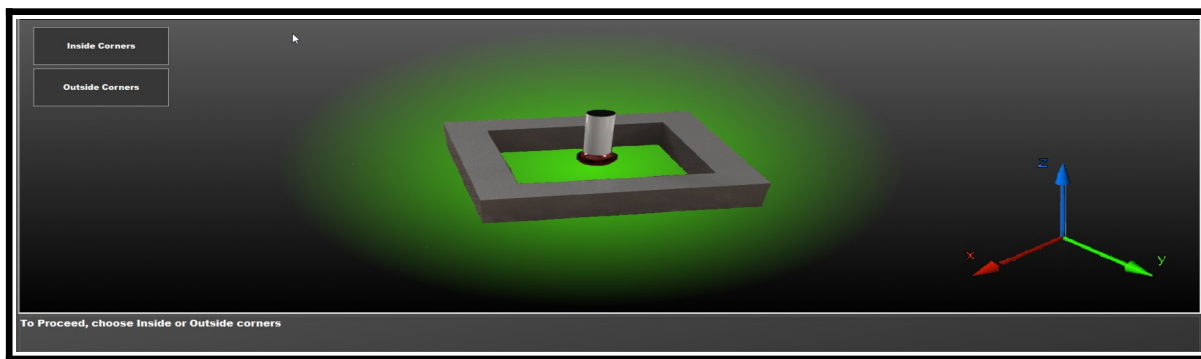


This completes Centering probing. Click on “Probe Home Page”, to probe another entity or simply return to the Main Run screen to start the Machining process.

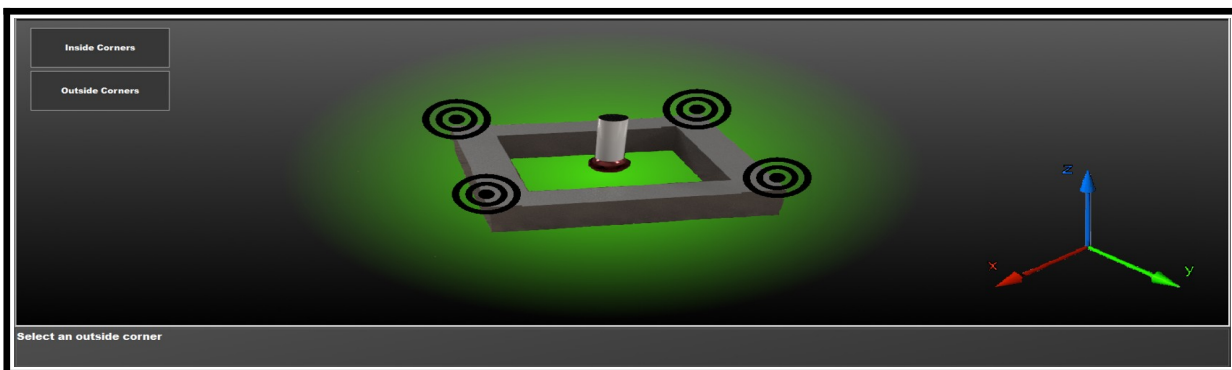
Cornering will be discussed in this section.



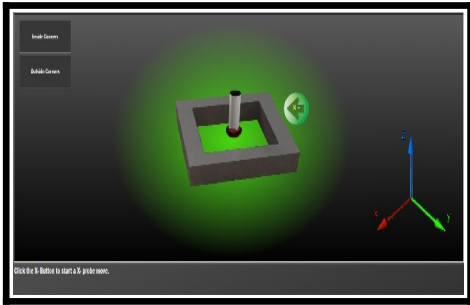
Once Cornering has been selected, Probing will navigate to Cornering Page.



Once inside the Cornering facility, There will be a prompt in the upper left corner of the screen to choose a side to probe. "Next Step" direction will be viable in the dialogue box under every Probing facility. The appropriate corners should be chosen at this time.



After selecting either "Inside", or "Outside" Cornering, Sets of targets will show up over the corners. Choose the corner that is to be probed.



Outside Cornering has been selected.

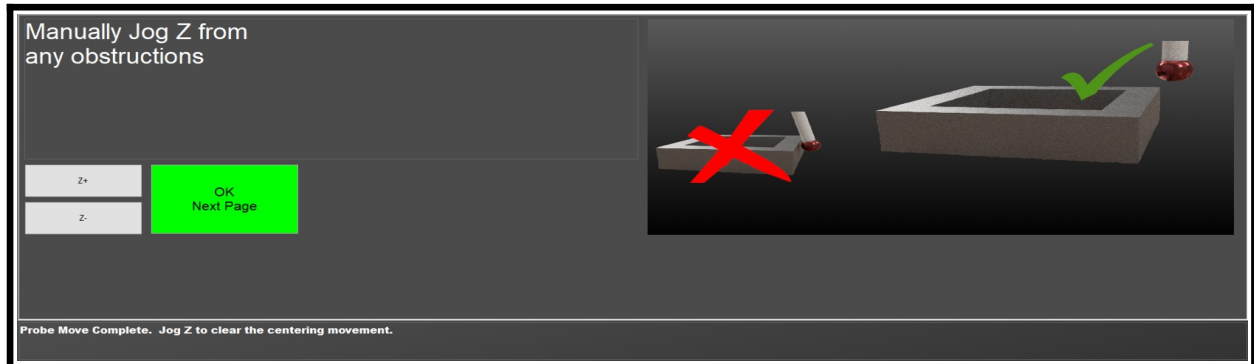
The images above, depict the sequence of probing directions and the Image buttons as they appear. Extreme caution must be used during Outside cornering. X and or Y Jogged into position to probe the opposing outside corner surface, and Z jogged to a height that will result in a successful probe strike. Direction for each of these steps will show up in the direction dialogue box.

Once an Axis direction button is pressed, Probing in the selected direction will start. If a successful probe strike occurs within the probe distance, the Probe will retract back to the position it was at when probing began.

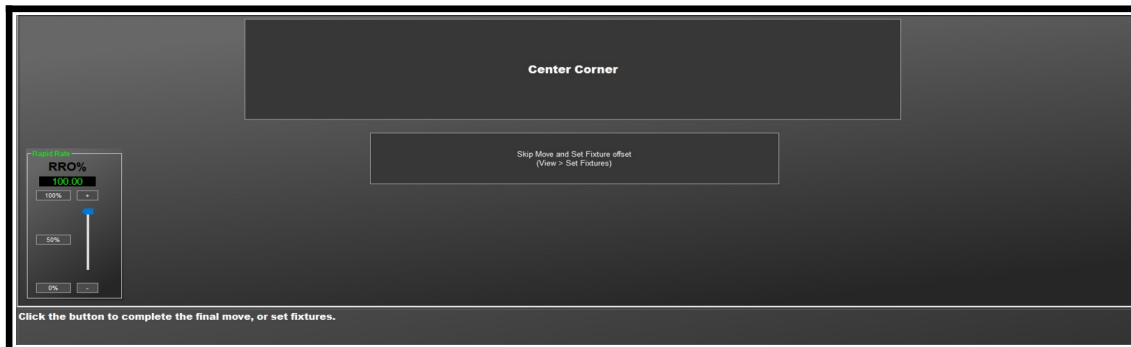
When Outside Cornering is complete, the Z clearance page will be present. This is an opportunity if necessary, to jog the Z axis to a safe clearance position for moving over the probed entity.

There are two Z jog buttons. One positive, and one negative, for jogging Z away from any obstructions. The dialog box has directions to do so at this time.

If the Z Axis is in an appropriate position, it is safe to move on and click the OK Next Page Button.

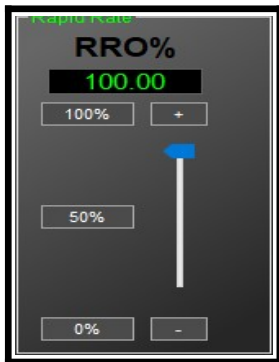


OK Next Page Button, will advance to “Final Move / Set Fixtures page.



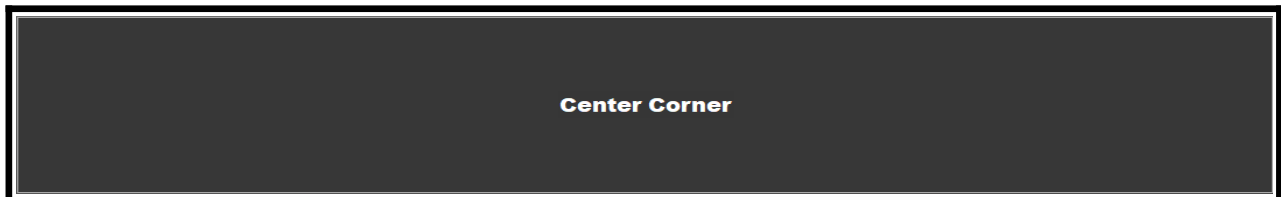


There is a Rapid Rate Override at the bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.

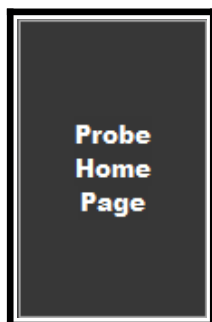


There is a Rapid Rate Override at the bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.

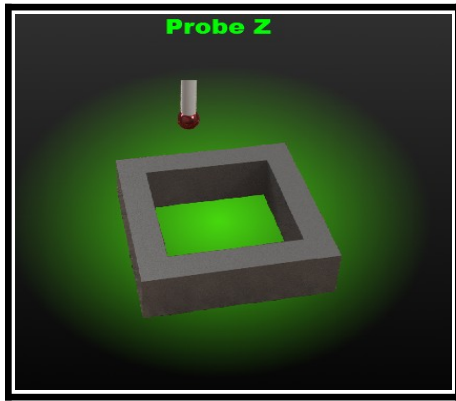
Two buttons on this page will complete Centering.



Center X and Y Button, will Move the Axis(s) over the center of the probed entity. Once the move is complete the Axis work Coordinates can be set at this time. If moving the probe over the probed entity after probing cannot be done, using the Skip Move and set Fixture offset button can be used to set the fixture offset for the probed entity without executing the centering move.

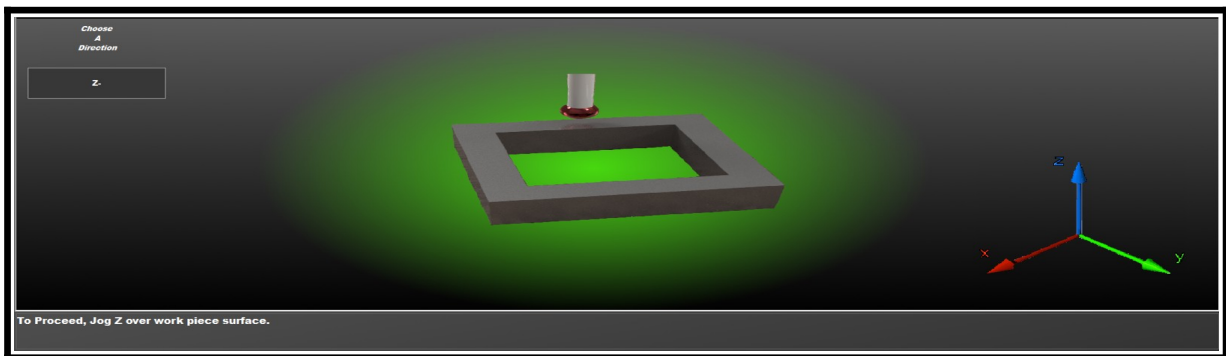


This completes Y Axis probing. Click on "Probe Home Page", to probe another entity or simply return to the Main Run screen to start the Machining process.

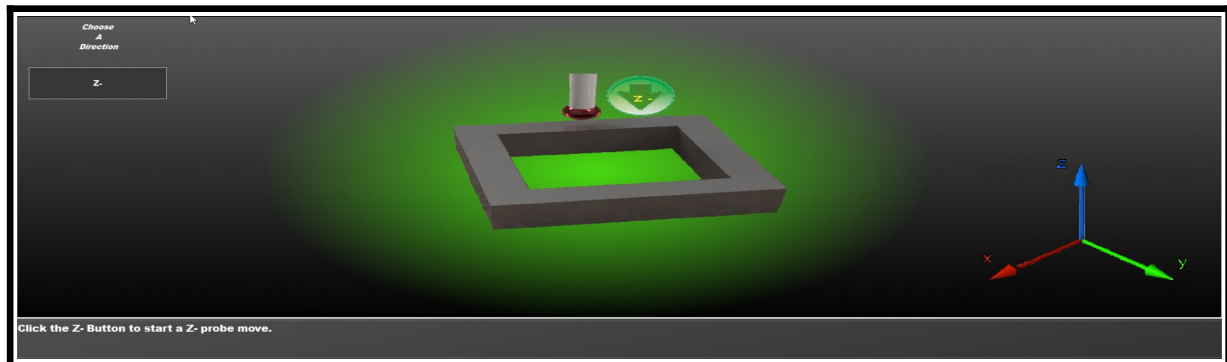


Probe Z will be disused in this section

Once Probe Z has been selected, Probing will navigate to Z probing Page.



Once inside Z probe facility, There will be a prompt in the upper left corner of the screen to choose the Z direction to probe. “Next Step” direction will be viable in the dialogue box under every Probing facility.



Clicking the Probe Direction buttons will place a start probe button on the screen that represents the direction to begin the Probe move.

The image above, depict Z-.

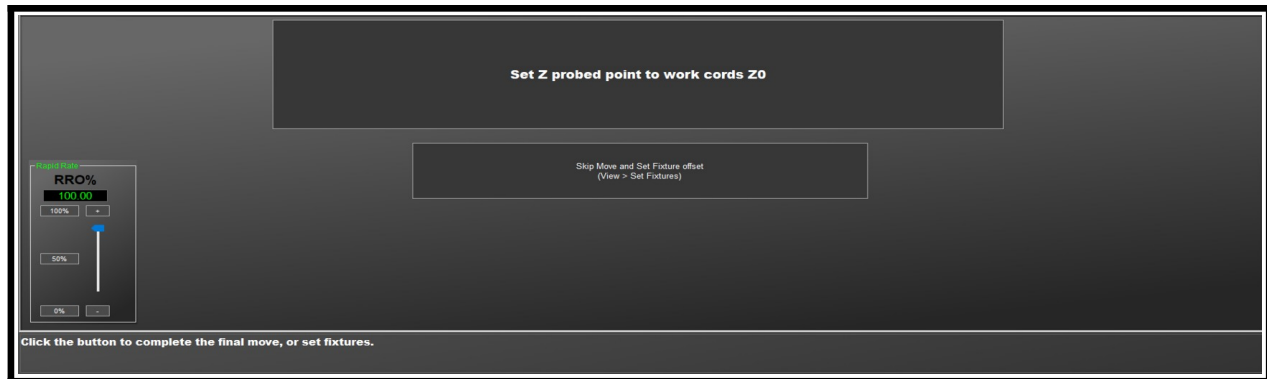
Prior to clicking on the probe direction button, Axis(s) should be jogged into position to probe the desired surface.

Once Z- is selected, Probing will immediately begin in the Z negative direction.

Once a direction button for Z is pressed, Probing in the selected direction will start. If a successful probe strike occurs within the probe distance, the Probe will retract back to the position it was at when probing began.



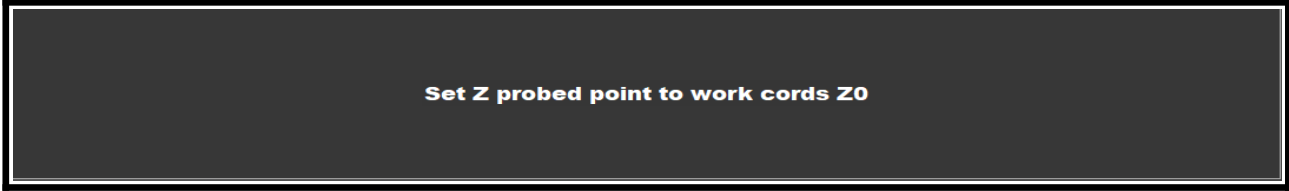
When the retract process is complete, the Z clearance page will be present. This is an opportunity if necessary, to jog the Z axis to a safe clearance position for moving over the probed entity.



There are two Z jog buttons. One positive, and one negative, for jogging Z away from any obstructions. The dialog box has directions to do so at this time.

If the Z Axis is in an appropriate position, it is safe to move on and click the OK Next Page Button.

OK Next Page Button, will advance to “Final Move / Set Fixtures page.



There is a Rapid Rate Override at the

bottom left of the this page to control the speed of centering movements executed by the Centering Button. This will influence the Rapid Rate override on the Main Mach page as well.



Two buttons on this page will complete Probe Y.

Clicking on the Set Z probed point to work cords Z0, will set the current work Z coordinate to 0. Z Probing will not rapid the probe at all.

This completes Z probing. Click on “Probe Home Page”, to probe another entity or simply return to the Main Run screen to start the Machining process.