Using Mach4 Trace

The Trace tab can be found in the standard Mach4 screens in the top tab bar.

The purpose of this document is to give an overview of the trace functions and user interface.

To start, enable the machine. Start Trace and Start Trace From File will become clickable. Choose one of them to get started, if you don't have a trace file already saved then you need to choose Start Trace.

- **Start Trace:** Multiple prompts will appear.
- **Start Trace From File:** A file selection prompt will appear, navigate to where you have a points file saved. The default is in the TraceIntermediary directory in Mach4.
- **End Trace:** Appears in the place of **Start Trace** once trace is started. End Trace is used to stop tracing whether trace was started from file or not.
- **Material:** A thickness can be added here. Once that has been done the bottom of the material will be Zero.
- **Cut:** Entering a value here will produce a cut depth per pass. A Value for Total Depth

must be used as well.

- **Total:** Entering a value here will produce a final depth of cut. If Cut is zero, a full depth of cut will be applied. If cut has a value, the total depth of cut will be divided by the Cut Value.
- **RPM:** Entering a value here will start the machines spindle at the entered value.
- **Rapid:** Entering a value in this field will determine the rapid plane for movement between entities.
- **Point:** A single point, which is not used in the creation of the tool path or G code file. It's sole use is to be exported in DXF files using Point Wizard.
- **Rapid End Point:** Rapid end point allows for movement to a different area of the screen without cutting the material
- **Line End Point:** Straight movements from the current point to the selected point, in a direct cut
- **Filet Mid Point:** A filet mid point is a point on the arc. After selecting the Filet Mid Point the button will change to Filet End Point to allow for a complete arc to be traced and finished
- **Arc Center Point:** An arc center point is the point in the center of the arc that the radius between it and the start and end points is the same. After selecting the Arc Mid Point the button will change to Arc End Point to allow for a complete arc to be traced and finished
- **2 Point Circle:** Selecting the center of the circle and one additional point along the outside edge of the circle
- **3 Point Circle:** Creating a circle by selecting three points along the circumference of the existing circle
- **Move To Start Point:** Jogs machine to the selected start point.
- **Return To Last Point:** Jogs machine to the last logged point. With 2 point circles the last point will be the selected point on the circumference.
- **Edit Points:** Opens the Point Wizard if there is any point files saved in the Trace Intermediary directory.
- **Undo Last Action:** Removes the last action from the tool path and sets the last point to the point before.
- **Jog Start:** Checks the state of the abs/inc button then jogs the machine accordingly using the axis numbers in the DROs directly to the left

For more information and a video description of how to use the trace tab, go to our official YouTube page *Mach Support*. Direct link: https://www.youtube.com/watch?v=t-4hqKA68jI&t=333s

Getting Started

Now, to start either press Start Trace from File or Start Trace.

Ignore this step if you pressed Start Trace from File. A prompt will appear to set the start point of the trace file, jog to the start position then select Start. The next prompt is for the feed rate, this is the feed rate at which the machine will be commanded in the generated G code file. The last prompt is whether to zero the axes.

Now you can jog to the points for the moves using either the jogging buttons in the RunOps jogging tab, or by using the Jog To Position section. Notice: The Jog To Position section has two jogging modes, Incremental and Absolute. Make sure you verify where you're machine will move based on the coordinates and the input position before pressing Start Jog.

If at any point you make a mistake and add a move you didn't mean to, you can easily revert back. The process to do that is, press Undo Action then press Return to Last Point. These buttons also work when starting trace from a file, and they allow you to move to the points from the file. If you press Move To Start point, the machine will move to the point at the start of the trace file. The Return To Last Point button will return you to the last input point in the file so you can start where you left off.

When you are done tracing points multiple prompts will appear in order. The first is to close the profile with a line, to enclose the shape just made by creating a line to the start point. The second is to save the points that were used to make the G code file in the tool path. If saved, these points can be used in the Point Wizard and to start from where you left off with Start Trace From File. The third prompt is to save the G code file that has been use to create the tool path to a non-temporary file.

Point Wizard

Point Wizard allows users to easily edit points in an already existing points file. Points files are created by tracing something using the trace tab and at the end selecting save points file. In-depth information on that can be found in the trace manual. This document assumes you have already created a points file.

Definitions

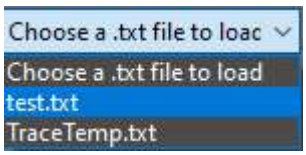
- **Choose a .txt file to load:** Displays saved text files from the TraceIntermediary directory
- **Settings:** Shows a popup box of settings for the currently selected points file. Allowing the users to edit the settings from the bottom DROs on the trace tab and the Machine Type. Machine Types only matter for generating Gcode through the wizard. If you will be exporting dxfs ignore the machine type since those settings will be in your CAM software.
    - Machine Types are as follows

0	Mill/Router
3	Tangential
4	3D Printer
5	Plasma/Laser

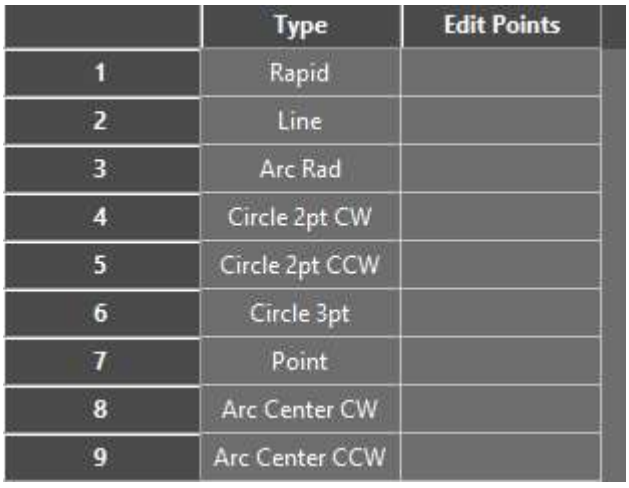
- **Generate GCode:** Generates basic Gcode using the information in the settings menu as a substitute to having using a post processor. For machine specific Gcode it's recommended to generate a DXF.
- **Generate DXF:** Generates a DXF to allow users to import their traced object into their CAD/CAM software.
- **Add Row Above:** Adds row above the selected row to the points file and table
- **Add Row Below:** Adds row below the selected row to the points file and table
- **Delete Selected Row:** Deletes the selected row from the points file and table
- **Refresh Table:** Sets the data in the table to what is in the selected points file.
- **Point Table:** Table of the points listed in the order they will be in the Gcode

Getting Started

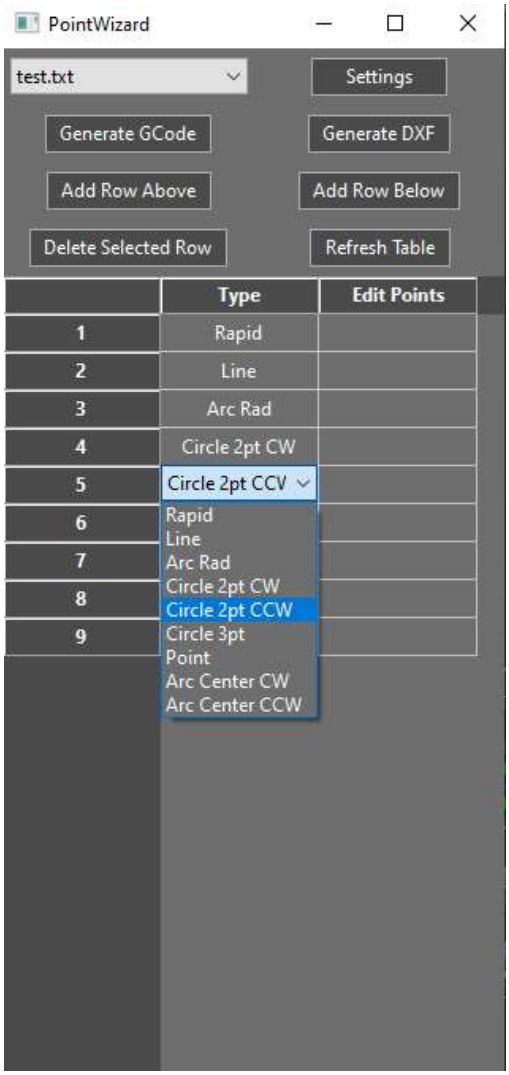
Click to display the list saved points files. Look for the file name that you input what you made the points file and click it.



As soon as a file is selected the table will populate with the points in that file.

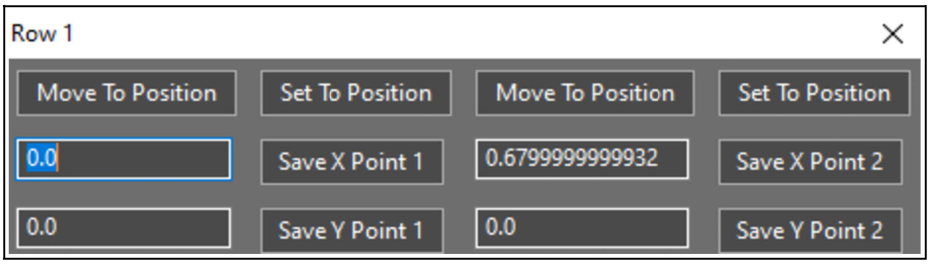


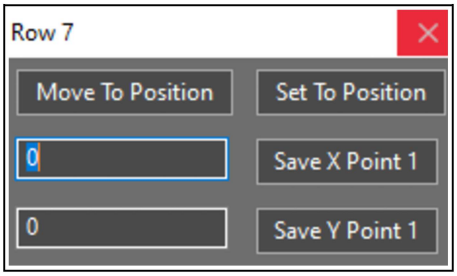
The file loaded in the figure above has one of all the different Move Types available. To change the move type, click on the name of the Move in the “Type” column to select it, then click it again to open the move type drop down.

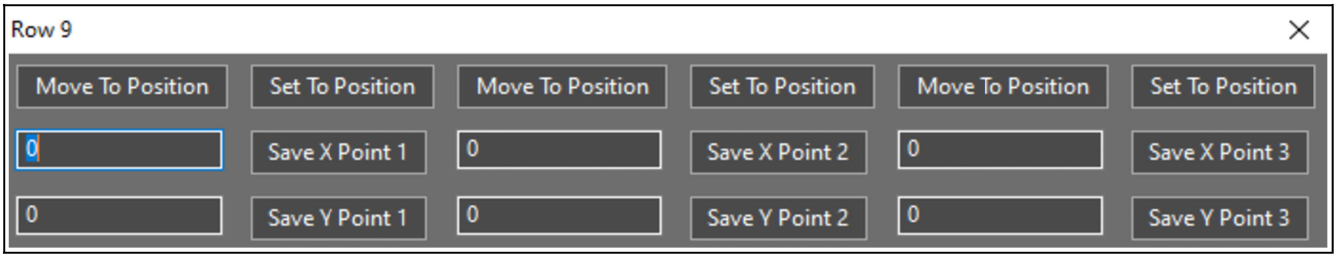


You can also edit the points of each move. Click in the edit points column on what ever row you would like to edit the points of.

One of three pop ups will appear depending on the move type in the row you selected. The only difference between the three is the amount of points you are editing because different types of moves need certain numbers of points to generate. The points correspond the points that are input when tracing the move in the trace tab. The popups have the row they correspond to in the top left corner you can make sure your editing the right points.







There is a “Move To Position” and “Set To Position” button for each point. There is also a button to save the axis point for each separate point.

“Move To Position” will jog the machine to the machine coordinate of the corresponding point. **Caution:** Pressing this button will move the machine. Ensure that it’s safe to move the machine before pressing!

“Save To Position” will read the position of the machine coordinates and set the point to that.

Table Editing

The add and delete row buttons are fairly straightforward and do exactly what they say. To use them ensue that you click on the row number on the far left of the table to select the row that you're editing around. For example if you click row 1 and click add row above, the new row will become row 1 and then selected row will be number two. If you then click delete row, row 2 will be deleted which is the original row that you selected.

Exporting DXFs

Using the DXF exporting workflow allows the DXF to be imported into any CAD/CAM software to be edited after using trace. Which allows you to use the accurate dimensions achieved from using trace right in the CAD software. It also allows users to generate GCode using the post processor settings already in their CAM software so Gcode will be the same as if the model was made in the CAD/CAM.