HOMING A LATHE (WITHOUT LIMIT SWITCHES)

Homing is a word used to describe movement of a point on the tool as it moves along the lathe axis / axes to a defined location. The place on the tool which causes stock removal is what the software should control. Clearance of the carriage to the tailstock, the actual body of the tool, the tool holder and anything associated with the controlled point is taken into consideration when defining the home location. Normally the homed location will be considered X=0 & Z=0. You need to define that location to the software. Mach can then use what is called Machine Coordinates to track all movements from the homed location. The Axis Position DRO's will show, where the tool point is, relative to a defined home location, within some range of axis movement (soft limits), at any time, as shown in the figure 1 below. Homing a machine moves the tool point back to a known position.
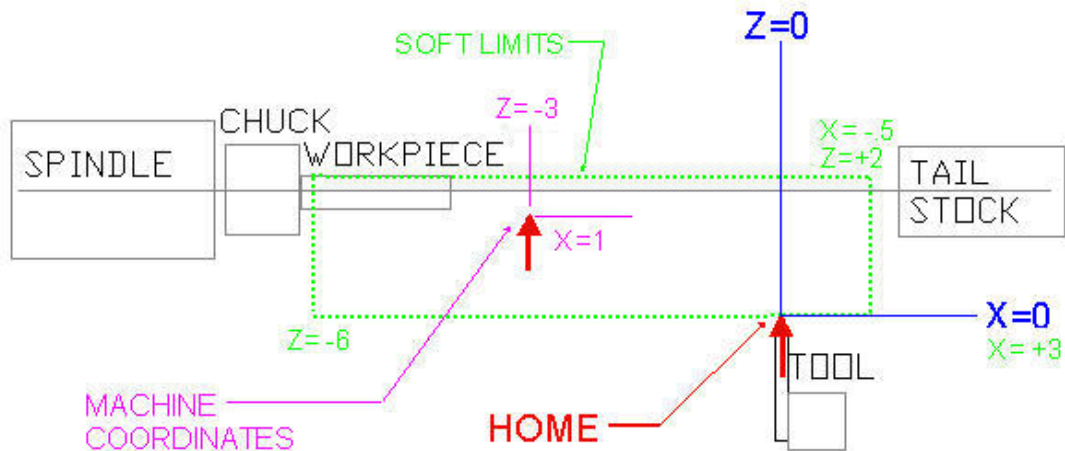

FIGURE 1

DEFINING HOME POSITION

Open Mach3 Turn in Manual Mode (FIGURE 2).

FIGURE 2

To define your home position just jog the axes to a location on the lathe.
In the Manual Mode screen (figure 3) of lathe operation screen, click the Zero World X
& Z buttons as they will reset any previous configuration to Z=0 and X=0. Click Machine
Coords. button to highlight it and then click the Set Home X & Z buttons. You have now
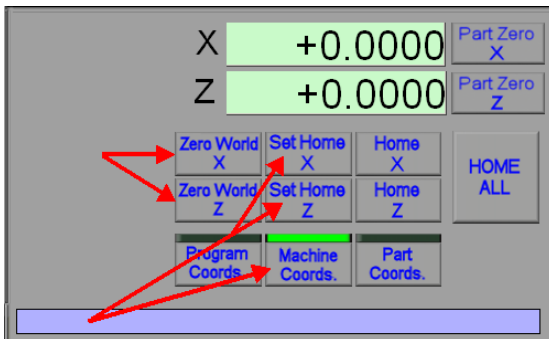defined to Mach that this home.

FIGURE 3

SOFT LIMITS
Soft limits are used to limit the travel of the axes from home and the table is found as
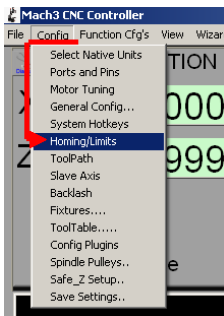shown below.

FIGURE 4

Enter data, by clicking on the appropriate entry box and inputting the data. Click OK when finished. The values in figure 5 relate to what was shown in figure 1.

1. Values define how far the tool will be allowed to move from the home position.
2. Defines the distance away from a min or max soft limit where deceleration of the table movement will occur.
3. Not checking this box defines that table movement will always be in a positive direction towards the home position of 0,0.

Motor Home/SoftLimits

Entries are in setup units.

Axis	Reversed	Soft Max	Soft Min	Slow Zone	Home Off.	Home Neg	Auto Zero	Speed %
X	✔	3.00	-0.50	0.10	0.0000	✘	✔	1
Y	✘	100.00 **1**	-100.00	1.00 **2**	0.0000	✘ **3**	✔	1
Z	✔	2.00	-6.00	0.10	0.0000	✘	✔	1
A	✘	100.00	-100.00	1.00	0.0000	✘	✔	1
B	✘	100.00	-100.00	1.00	0.0000	✘	✔	1
C	✘	100.00	-100.00	1.00	0.0000	✘	✔	1

G28 home location coordinates

X	0	A	0
Y	0	B	0
Z	0	C	0

OK

FIGURE 5

The home location for the controlled point was defined along with soft limits.
Before exiting Mach click the Home All or the Home X & Z buttons.
Mach saves you settings on exit.

OPERATIONAL NOTES

1. Switches are normally used with homing and provide for a repeatable home location. They also provide for a positive means of stopping the axis. Not having switches you are relying on software to stop movement (soft) instead of a switch (which is hard). Without switches, should you loose position because of missed steps, you will have lost your defined home position and homing will not take you back to an accurately defined point.

2. When you exit Mach your settings and axis position is saved. If you home before exiting, and the axes are not moved, you will at the defined home position upon re-entering, but you will need to click the home Z & X buttons. If for some reason the axis was moved when not in the program then upon re-entering Mach you will not be at home anymore.

3. If homing was not done before exiting and the axes are at some position away from home, you must manually move back to the home position on re-entering. The axis positions were saved so the values can be used via step jogging or a G0 coded move using the MDI line.

4. Soft limits can be activated or de-actived via a button in the "AUTO SCREEN ".

This write up just provides a quick overview of how to setup homing on the lathe without switches. The Using Mach 3 Turn Manual provides in depth information on homing and associated items relating to homing.

Clicking the Home X or Z buttons or HOME ALL BUTTONS will move the cutter back to the home position. HOME ALL will first move the X axis to home and then home the Z axis.
Home Z will only move the Z axis to home and Home X will only move the X axis to home.