Five Piece Door User Manual

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THERMWOOD
First in CNC Routers

Five Piece Door User Manual

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Overview

Thermwood's Five Piece Door application offers a means for creating five piece doors and drawer fronts, as designed in Thermwood's eCabinet Systems software. Five piece doors consist of two stiles, a left and a right, and two rails, a top and a bottom, as well as a center panel. This program enables the designer to base their design on a standard library of door/drawer fronts, or to create something totally unique. It is designed to take an output file (*.TWD format, generated from eCabinet Systems), that contains a custom five piece door. Simply generate the CNC file from any job or cabinet that contains a "build in house" five piece door/drawer front, and it will be created, ready to be loaded into the Five Piece Door program at the Thermwood Machine.

Options are available in the application to designate the tooling to create a desired design shapes for the bead, raise, and profile. A clamping fixture is utilized to hold the stiles and rails for machining. A matted pad holds the panel for machining, and is also used with the assembled door for perimeter machining. Parts can be filtered for processing for only those required at one time, or the entire job can be run at once. Labels can be also created for each part during the "Write CNC" process. Once the CNC file has been created, the machine can be started, and the operator will be instructed through each step, guided by text provided on the machine control's screen. If the next process to be completed is a rail or stile, the operator is informed of what size blank to place in the clamps, as well as where to place the clamps.

Launching the Application

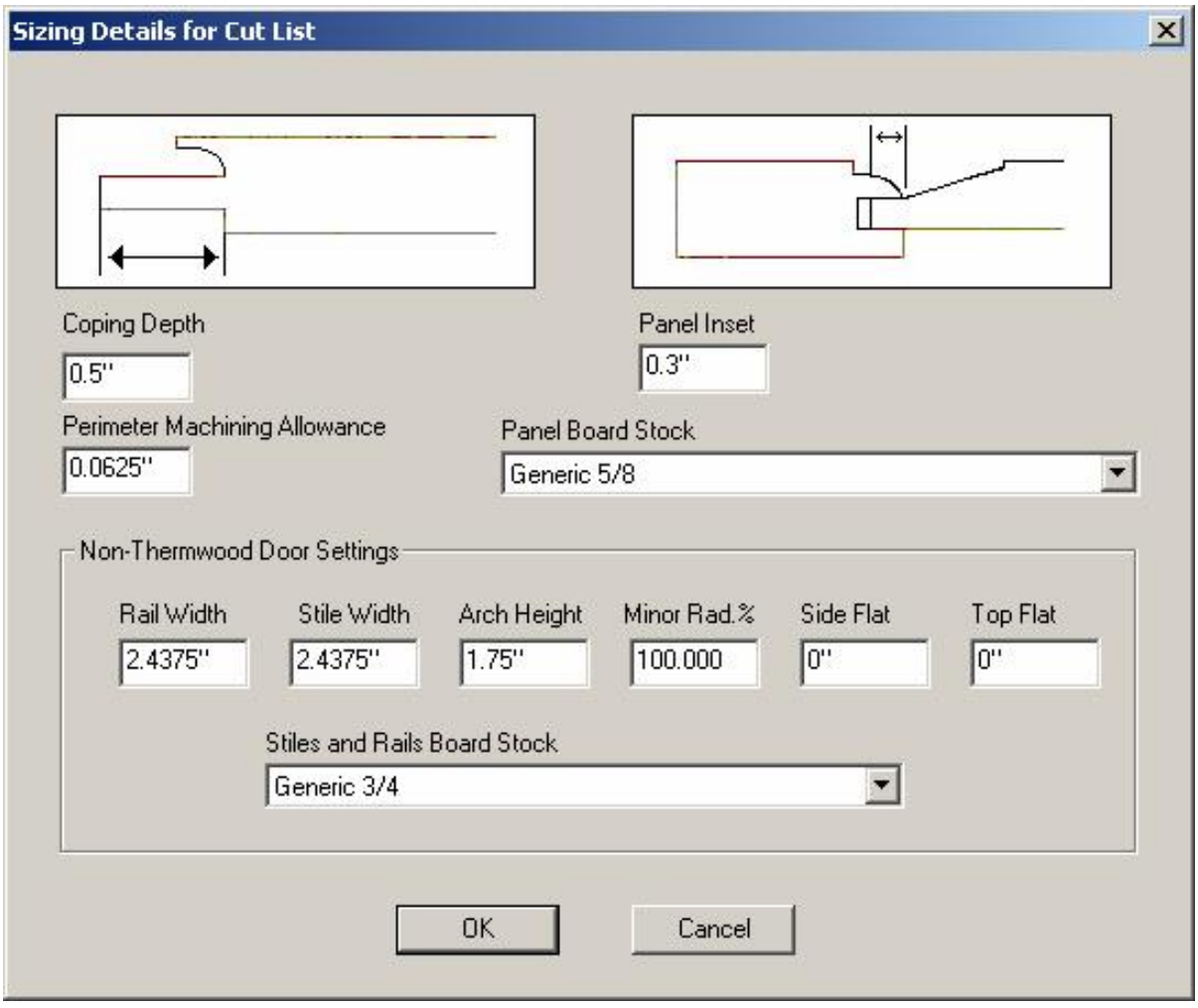
The Five Piece Door program is an application that runs on the Thermwood SuperControl. It is launched from the main SuperControl screen by selecting "F11" <THM Options> and then "F6" <Five Piece Door>. The Five Piece Door Main Window screen will appear now.

eCabinet Systems Information

eCabinet Systems Settings

In eCabinet Systems, selecting "Settings/Preferences" and then "Default 5 Piece Door For Cut List", the following screen will appear:

NOTE: When using the "Build In House" option for vendor door/drawer fronts, it is important to understand that what is displayed is just for reference. What you see graphically, and the settings that are displayed here, and in the "Details for Cut List" area may not correspond. The vendor door/drawer fronts will display with the rail and style widths and the material color/texture(s) that are predetermined by the vendor's specifications.



NOTE: Be aware that the settings that display in the fields are general defaults and must be confirmed to your application.

eCabinet Systems Sizing Details for Cut List

Coping Depth

This is the distance to be added to the rails for coping into the stiles.

Perimeter Machining Allowance

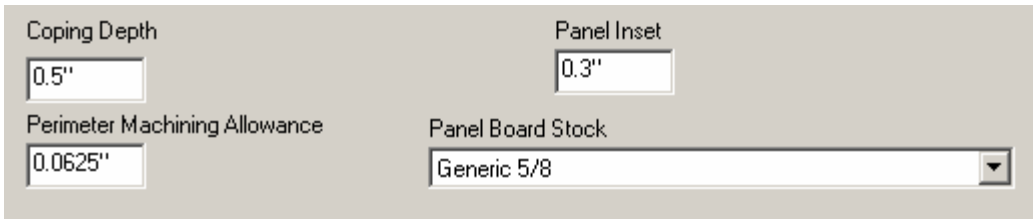
This is the amount of material that will be added to the perimeter to true the door.
It should be noted that the stile and rail width will become narrower on the finished door by the value that is entered here.
If this is not desired, the stile and rail width must be increased by this Perimeter Machining Allowance amount to compensate.

Panel Inset

The center panel will be machined to allow it this distance inside the rail/stiles.

Panel Board Stock

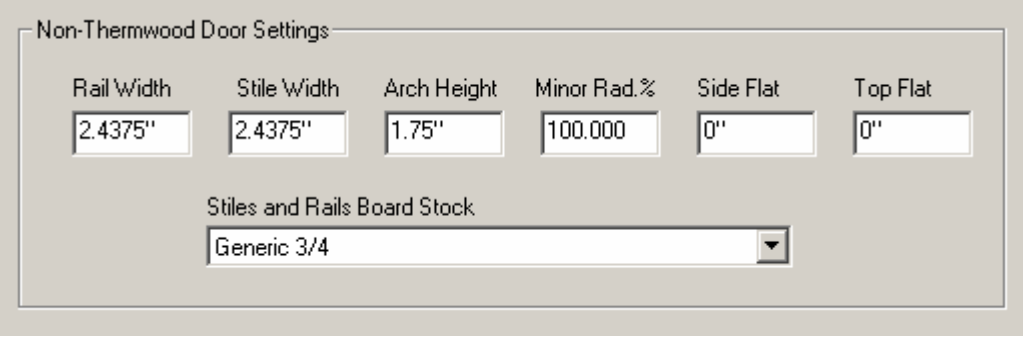
The center panel will be made of this material. Confirm that the thickness is correct.



Non-Thermwood Doors

Note that if you are using a Non-Thermwood door as the reference door, there are additional settings needed to create the door. (Thermwood doors have these values set based on the selected door).

NOTE: Remember that these settings are completely separate and do not reflect what is set in the default five piece door "Details for Cut List".



Rail Width

This is the width of the rail, including the Perimeter Machining Allowance.

Stile Width

This is the width of the stile, including the Perimeter Machining Allowance.

Arch Height

This is the distance, from the widest part of the top rail, to the bottom of the arch.

Minor Rad. %

This value is used for cathedral doors only. It specifies the radius of the arcs that join the main arch, as a percent of the radius of the main arch. If this amount is 100%, than the arc's radii are identical.

Side Flat

The distance of material that is not curved, on either side of the main arc.

Top Flat

The straight (no arc) distance in the center of the main arc.

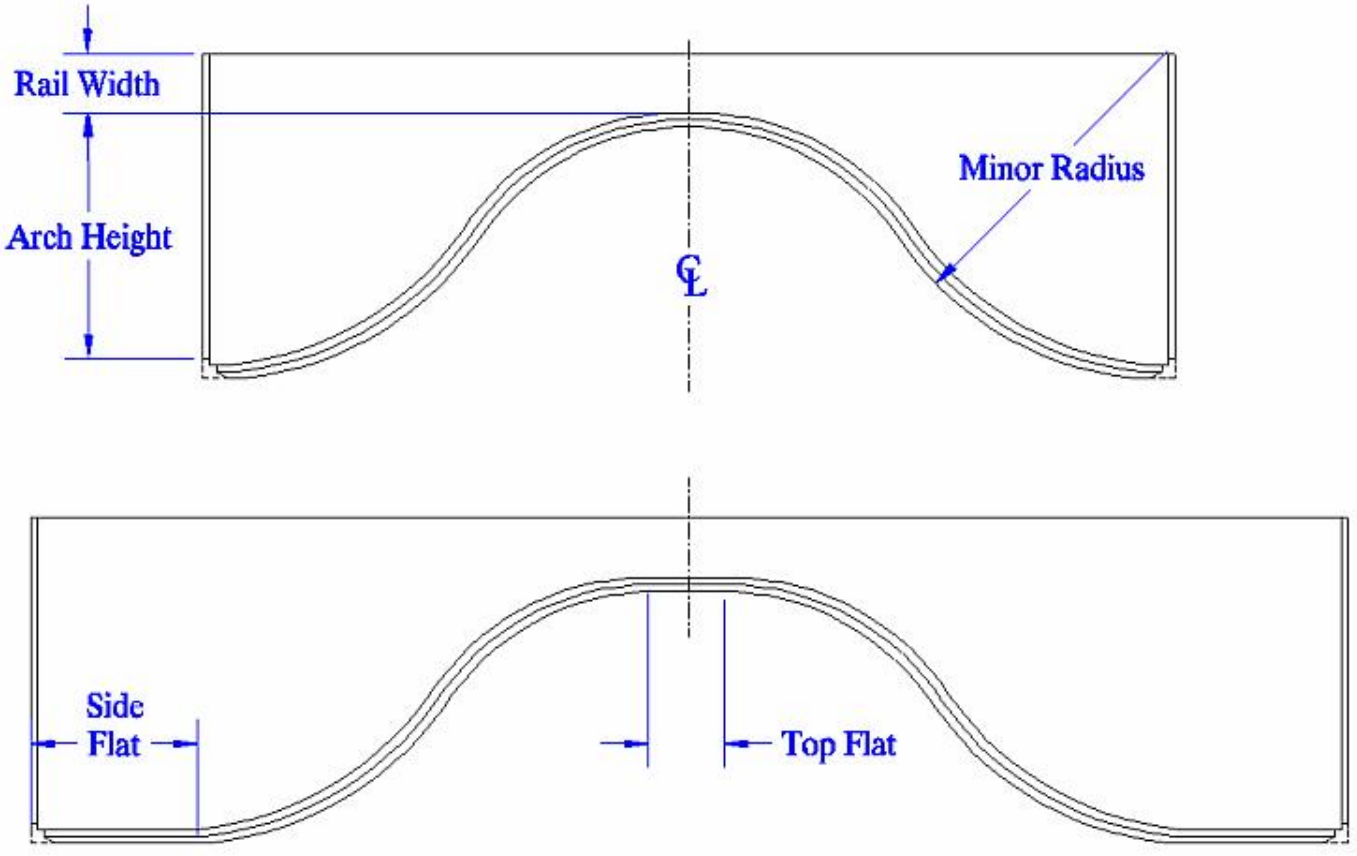
Stile and Rails Board Stock

The rails and stiles will be made from this material. Confirm correct material dimensions.

NOTE: All of the values listed above will be used for all doors in this job or cabinet; however, individual overrides to these defaults can be made by selecting "Details for Cut List", in the specific Door/Drawer Front Design screen.

Reference Drawing for Non-Thermwood Doors

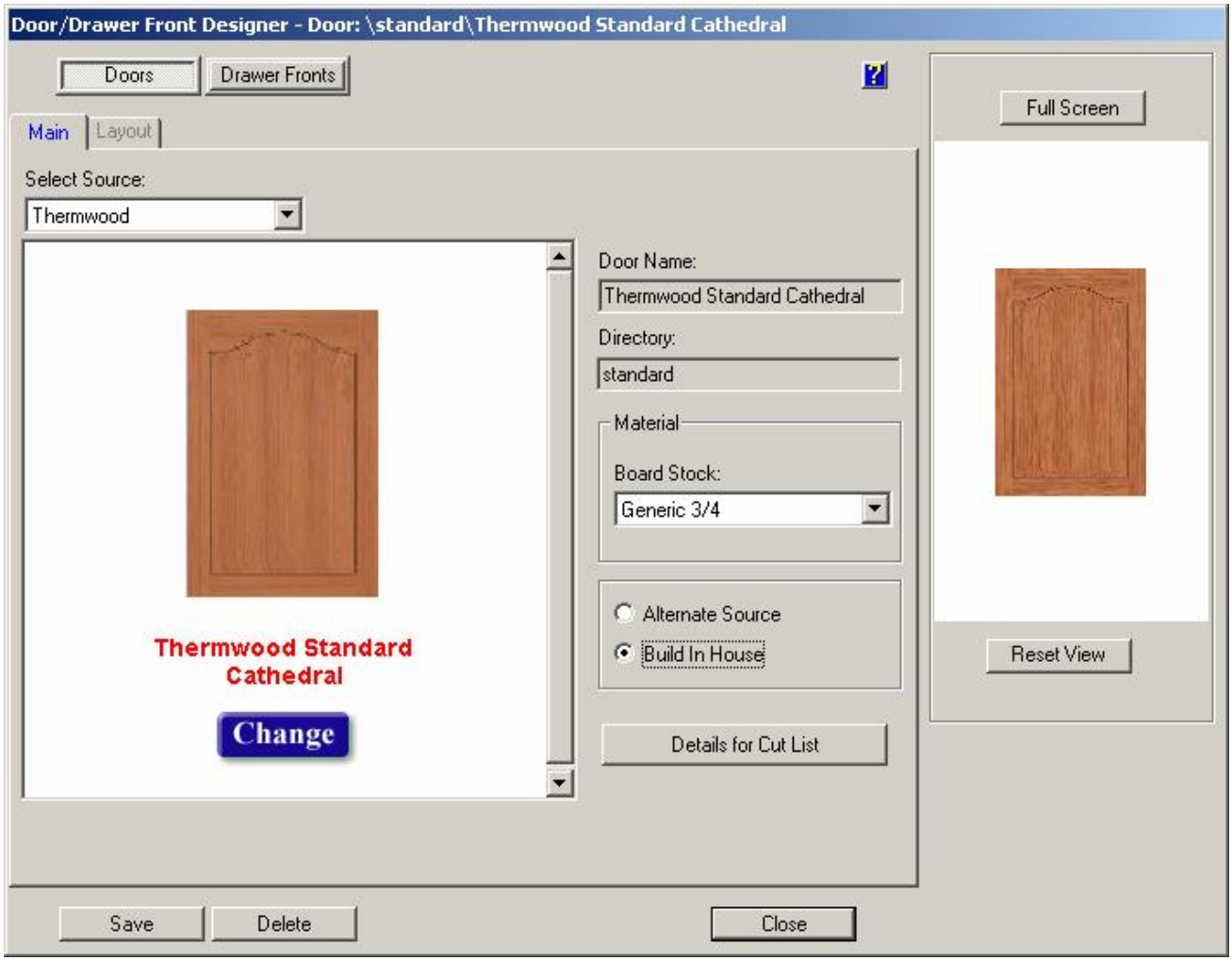
Top Rail shown.



eCabinet Systems for Cut List Overrides

Specifying different door defaults

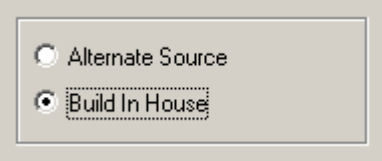
Individual overrides to the door default settings can be made by selecting "Details for Cut List", in the specific Door/Drawer Front Designer screen. In this example, a Thermwood Standard Cathedral Door is selected. Again, remember to select "Build In House" to use the Five Piece Door program.



NOTE: When using the "Build In House" option for vendor door/drawer fronts, it is important to understand that what is displayed is just for reference. What you see graphically, and the settings that are displayed here and in the "Sizing Details for Cut List" area, may not correspond. The vendor door/drawer fronts will display with the rail and style widths and the material color/texture(s) that are predetermined by the vendor's specifications.

eCabinet Systems Build In House

Door/Drawer Front Designer



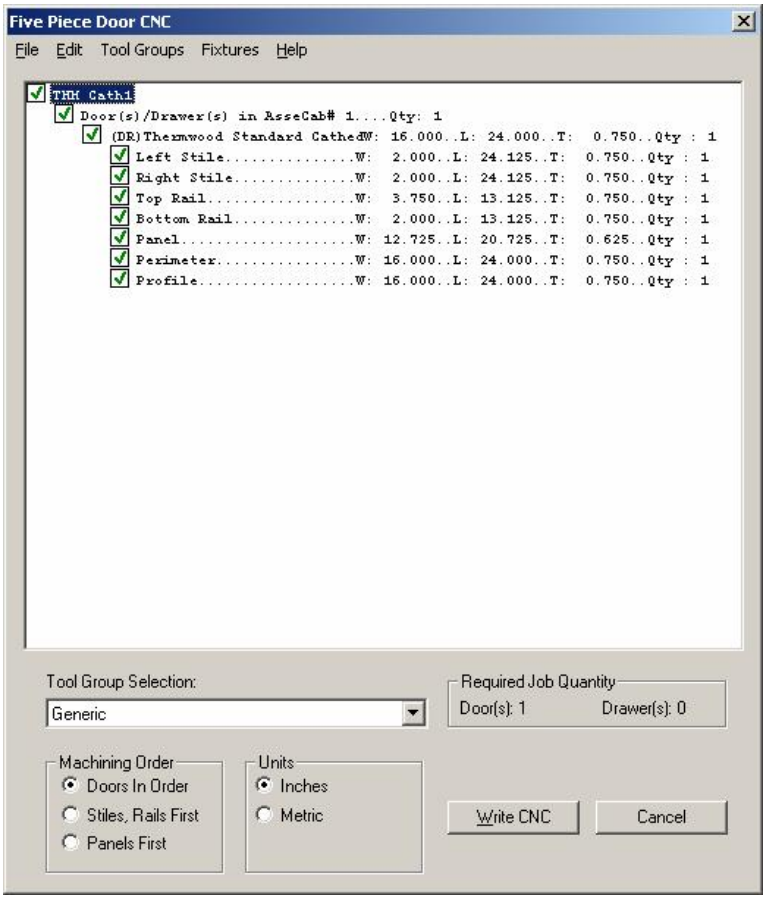
NOTE: Doors will only show up in the Five Piece Door Program when the "Build In house" option is selected!

Five Piece Door Program

Five Piece Door Main Window

Upon Launching the Program Application, you will see the following screen.

NOTE: The previous job's data will automatically be displayed when the Five Piece Door program is loaded.



Menu Option Selections

On the top of the screen is a Windows Menu that provides the selection of the program options. Starting from the left, the first menu option is "File".

File

Open

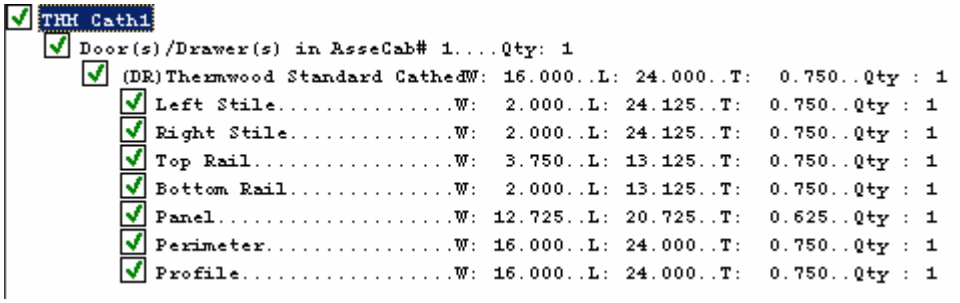
Provides a window where you can select the *.TWD file that you want to run. This will overwrite any previously displayed job.

Exit

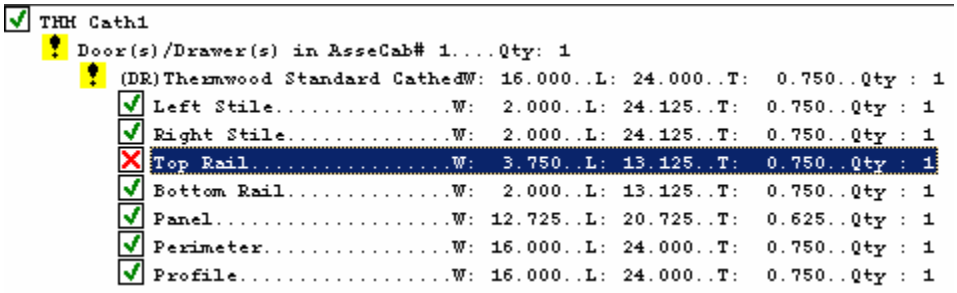
Closes the program completely.

Five Piece Door Main Window Settings

At each line there is a checkbox, and listed in descending order are the Door Name, the applicable Cabinet Assembly, the Door Type and the list of components that will construct that door.



Note that if this job contains multiple doors, an additional list(s) of additional components will follow directly below this one.



The checkboxes are used to deselect specific parts from the job. Green checks indicate that all parts are selected and will be processed. Clicking on (for example, one of the rails or stiles), will cause a yellow exclamation point marker to show in the Cabinet and Door Type selection area, alerting you that this job will proceed, but will not be complete. Clicking anywhere above the component list will cause a red "X" to be displayed, showing that this job will not be processed.

Tool Group Selection

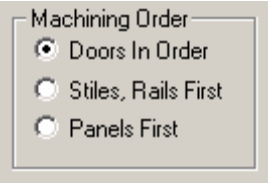
Tool Group Selection

If you have created different Tool Groups, this option will enable selection of the Tool Group of your choice. Otherwise, the
Default selection set will be used.

Machining Order

Machining Order of door parts

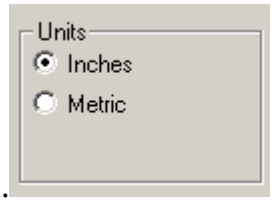
This option provides a choice in what order the parts are created. Depending on the type and quantity of the job, it may be advisable to run the job in the order shown on screen, to run all the stiles and rails first, or to run all of the panels first.



Units

Unit Selection

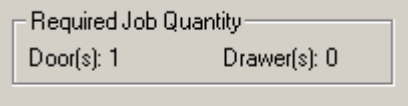
This switches program display from English (inches) to Metric (millimeters).



Required Job Quantity

Required Job Quantity

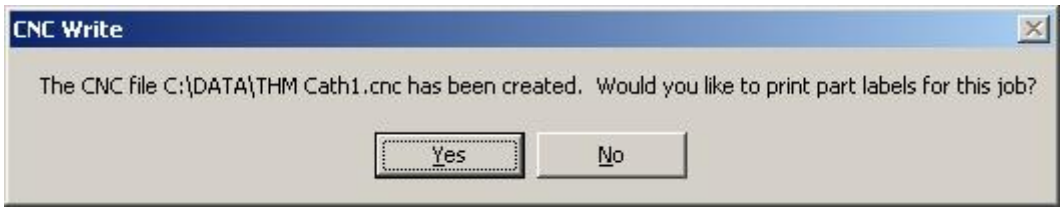
This display shows a tabulation of what amounts of doors and drawers are required for the loaded job.



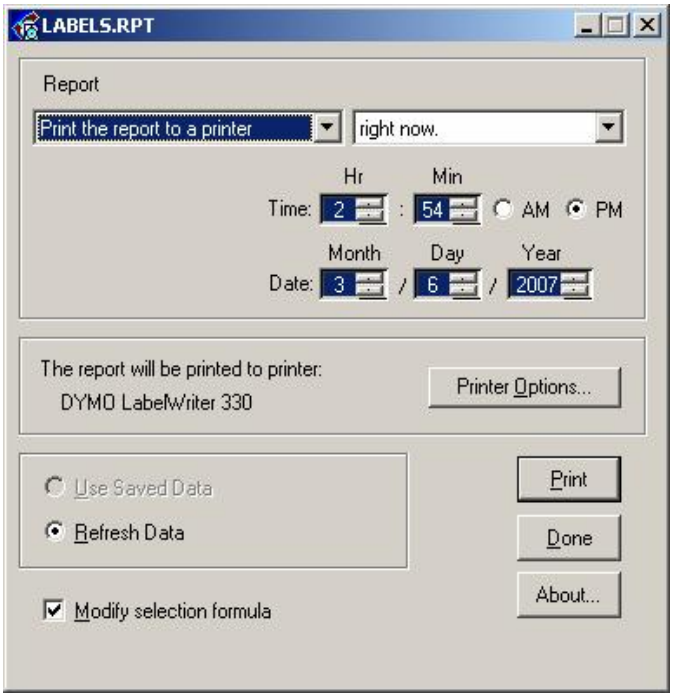
Write CNC and Cancel Buttons

CNC Write

This button outputs your job to a Thermwood CNC file. If the "CNC Quick Write" checkbox is not enabled, you will be asked for a file name and a directory location to save this file. You will then get a confirmation screen and an option to print labels to apply on your parts.



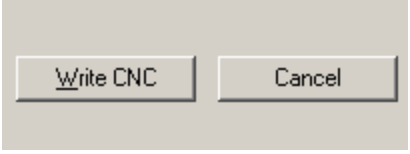
If you enter "Yes", you will get the label screen as shown below. Select the "Print" button to print labels, and "Done" when they are finished.



NOTE: At this time, the CNC file for the parts will be loaded to the SuperControl, and will be ready to run. Confirm that any offset locations, tooling, daylight values, etc. are set properly before executing any part program, (including this one)!

Cancel

This button closes the program.



Edit

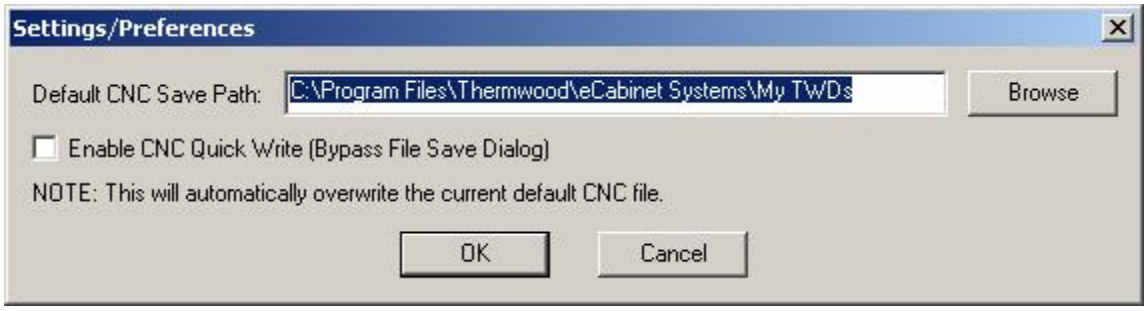
Settings/Preferences

Default CNC Save Path

This is where you can accept the default file location displayed, or browse for a different location to save your data.

Enable CNC Quick Write Checkbox

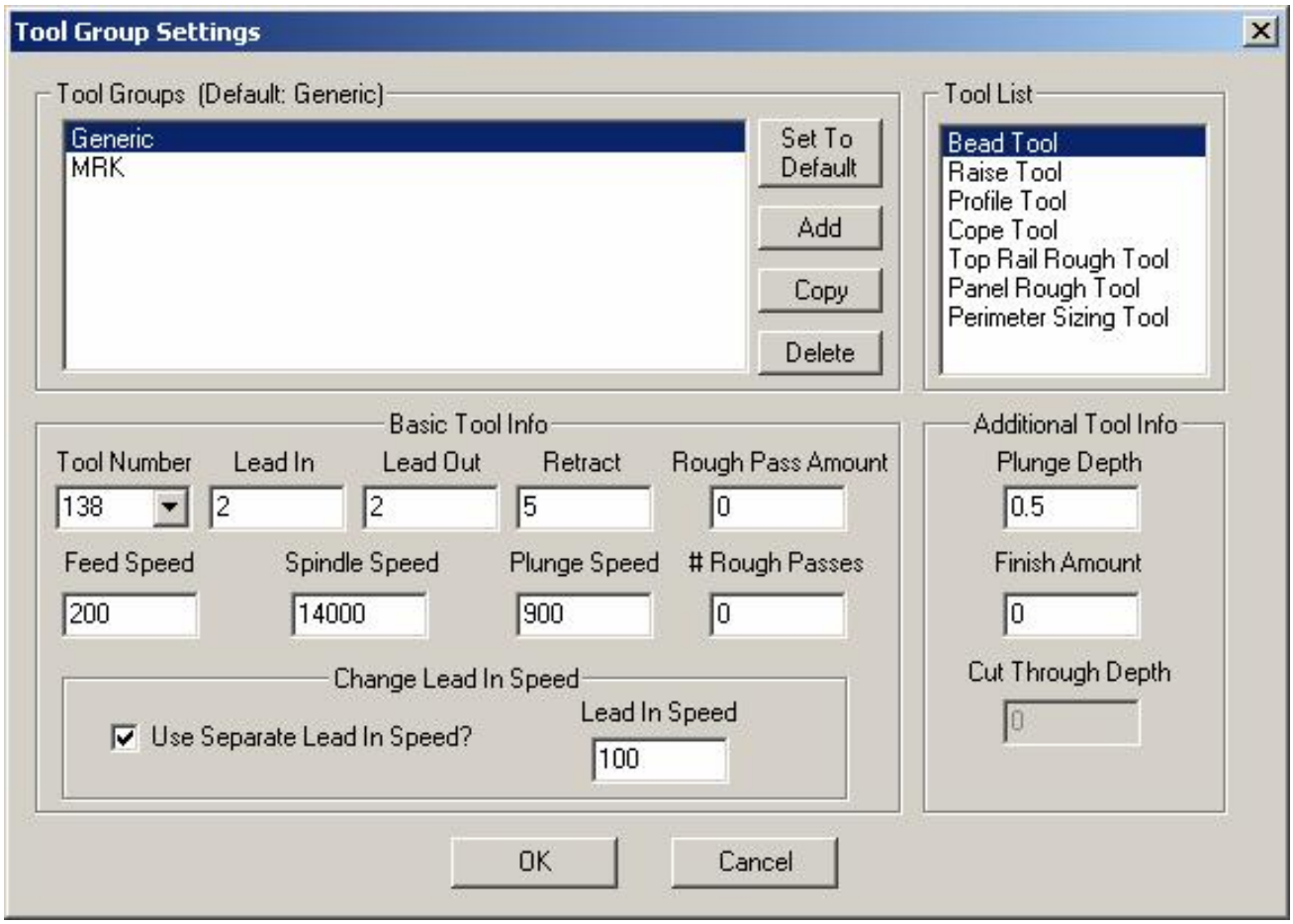
If this box is checked, there will NOT be any warnings regarding the overwriting of any existing files. This option saves time, but also gives no warning of any filename duplications, and will overwrite the current default CNC file.



Tool Group Settings

Tool Group Settings Window

This menu option is where you will define the tools that will be used to run and complete this job. Pay attention to the specific options that are available for each type of tool.



Tool Group Selection

Tool Groups

There will always be a default group, called "Generic". This file can not be deleted, and while it can be modified, it is suggested that it is kept intact as a pattern file.

Copy

It is suggested that you use this button to create a new Tool Group, with a name of your choosing. (In this sample image, one is created called "MRK").

Set To Default

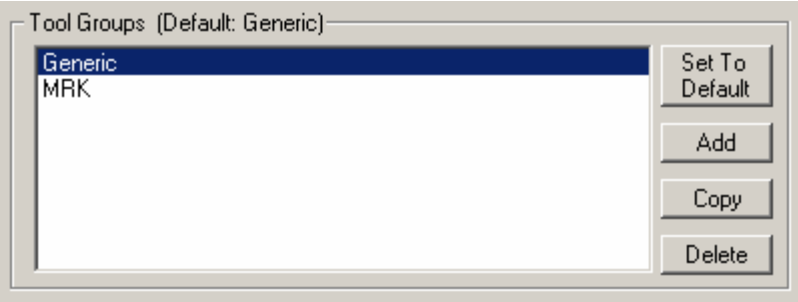
This button enables you to select which tool group will be used as the default.

Add

This button allows creation of a new tool group. The initial values will be applied to it from the program's original "Default" values.

Delete

This button removes the selected Tool Group.



Tool List

Tool List Section

This shows the available tools. Currently there are 7 tools, and they are listed below.

Bead Tool

This tool cuts the bead on the stiles and rails. For rough passes, it moves horizontally.

Raise Tool

This tool cuts the raise in the center panel. For rough passes, it moves vertically.

Profile Tool

This tool cuts the outer profile of the door. For rough passes, it moves vertically.

Cope Tool

This tool is used to cope the ends of the rails. For rough passes, it moves horizontally.

Top Rail Rough Tool

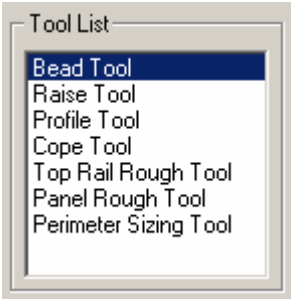
This tool is used on arched or cathedral rails to "rough out" the arch. For rough passes, it moves vertically.

Panel Rough Tool

This tool sizes the center panel. For rough passes, it moves vertically.

Perimeter Sizing Tool

This tool cuts the door to the final dimensions. For rough passes, it moves vertically.



Basic Tool Information

Basic Tool Info

This section shows each tool's details, and allows the selection of the following parameters.

Tool Number

This is the number assigned to a particular tool for your Thermwood machine.

Lead In

This specifies the amount of distance used for the Lead In.

Lead Out

This specifies the amount of distance used for the Lead out.

Retract

This specifies the distance the tool retracts for indexing.

Rough Pass Amount

This specifies the distance increment for the Rough Pass[es].

Feed Speed

This is the specified feed speed, when cutting, in inches per minute or in millimeters per minute.

Spindle Speed

This is the specified spindle speed, in RPM.

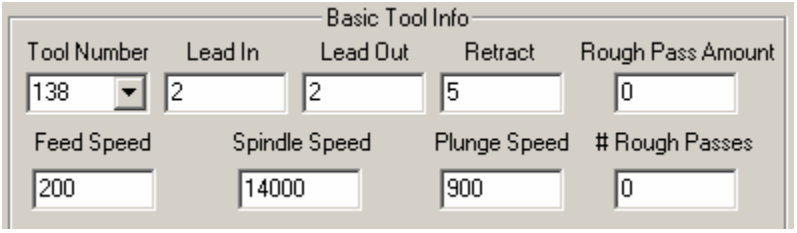
WARNING! Ensure that you do not exceed the tool manufacturer's maximum RPM speed for each tool!

Plunge Speed

This is the specified speed, in inches per minute or in millimeters per minute.

(#) Rough Passes

This specifies the amount of rough passes to be performed.



Lead In Speed

If blowout is occurring, you may want to slow the Lead In speed. Go to the section labeled

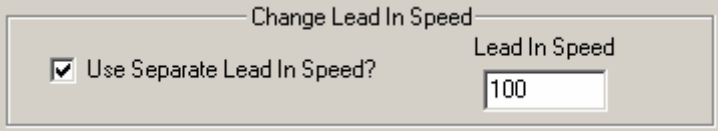
Change Lead In Speed

and check the box next to

Use Separate Lead In Speed.

You can now enter the desired Lead In Speed, in inches per minute, or in millimeters per minute, in the area below

Lead In Speed.



Additional Tool Information

Additional Tool Info

This section enables you to set the other applicable variables.

Plunge Depth

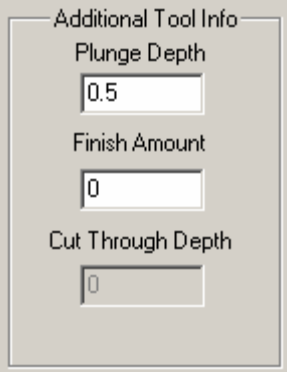
The tool will plunge this distance.

Finish Amount

This is the amount of material that will remain for the finish pass.

Cut Through Depth

This is the distance that the tool will cut below the part's bottom face.



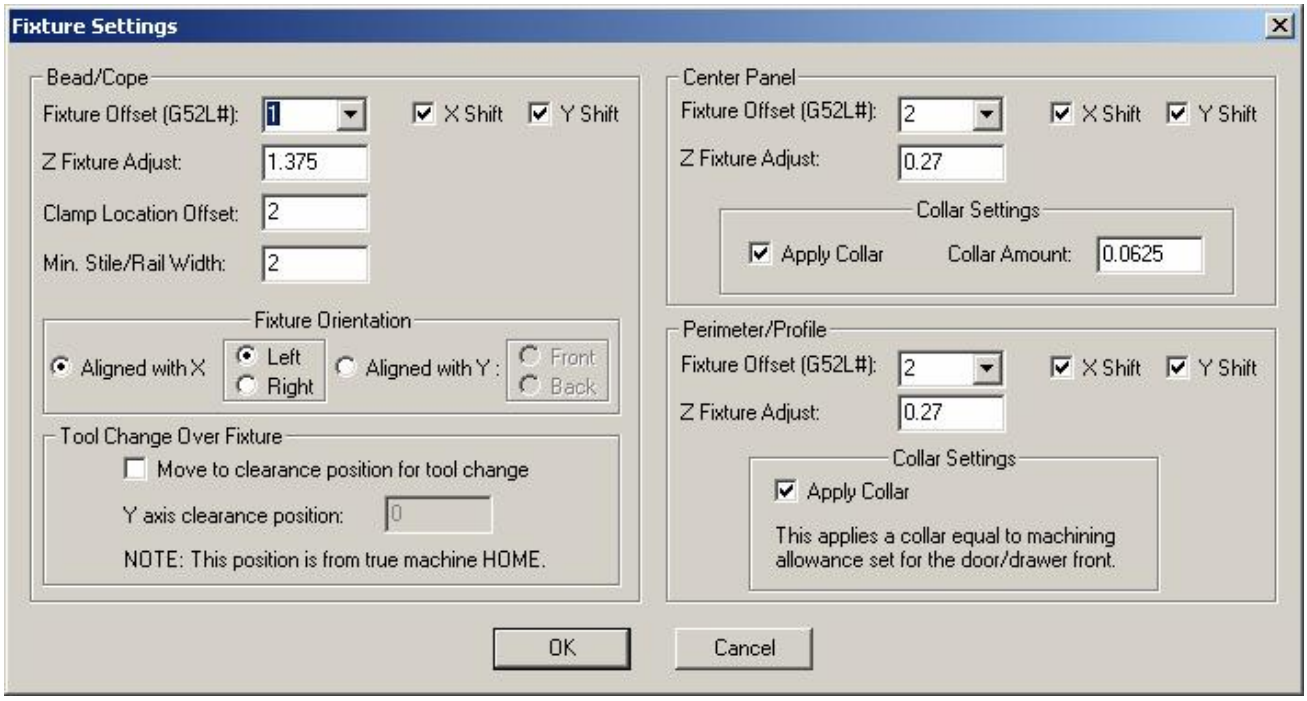
Fixtures

Fixture Settings

Fixtures

Fixture Settings

This window controls the specific settings that your Thermwood Machine needs to know regarding your choice of fixtures, and their orientation.



Bead/Cope

Bead/Cope Section

This section allows the information to be set to create the stiles and rails.

Fixture Offset (G52L#)

This is the number code that defines the fixture offset.

X Shift Checkbox

Select this if you require an X Shift for the part's dimensions.

Y Shift Checkbox

Select this if you require a Y shift for the part's dimensions.

NOTE: Remember that an X or Y shift is based on the location of your fixture's origin, and the fact that the part's origin is always the corner closest to Machine Home. If the location point of the fixture is not in the part's corner closest to home, a shift will be required.

Z Fixture Adjust

This is the distance from the bottom of the part to the top of the spoilboard.

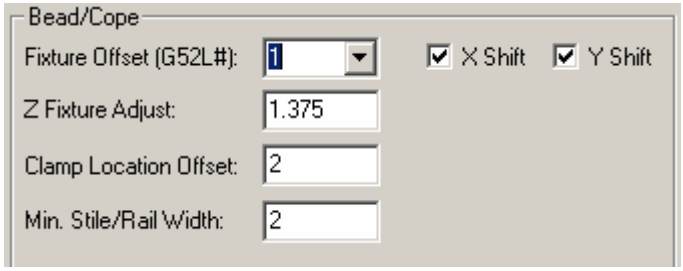
Clamp Location Offset

This is the distance from the end of your part, to the edge of the first inboard clamp, and is needed to prevent a possible collision between the clamp(s) and the tool.

NOTE: You will also be prompted for clamp locations, based on this value, at the start of each stile or rail job run.

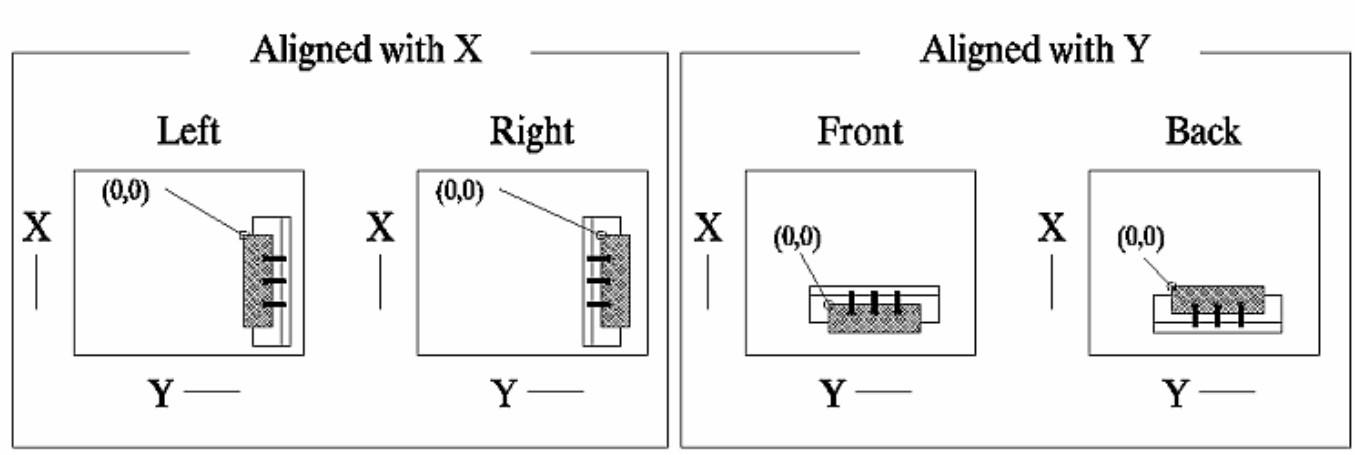
Min. Stile/Rail Width

This sets the minimum allowable width limit for the stile/rails.



Fixture Orientation

Fixture Orientation Diagram



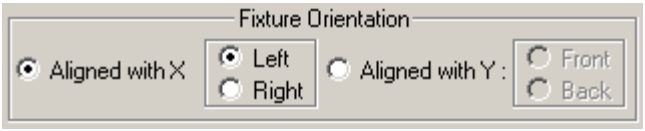
Fixture Orientation

It is important that you know where your origin, ("0, 0" point) is, and it is set here, as based on your requirements. The options are:

Aligned with X (Left or Right)

and

Aligned with Y (Front or Back)



Tool Change Over Fixture

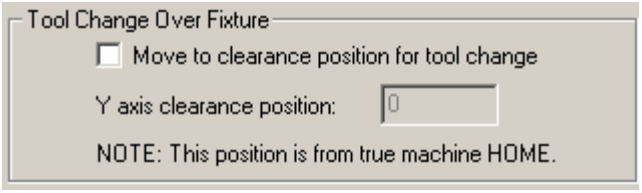
Tool Change Over Fixture Setting

If you desire to use this option, enable it by checking the box next to

Move to clearance position for tool change

and the enter the desired location (in inches or millimeters) next to

Y axis clearance position



NOTE: This feature ensures that there is no collision between any part of your work or fixture while the tool change operation is occurring. Also note that this clearance position is referenced from your Thermwood's Machine Home position!

Center Panel

This section allows the information to be set to create the center panel of your door. The options available are:

Fixture Offset (G52L#)

This is the number code that defines the fixture offset.

X Shift Checkbox

Select this if you require an X Shift for the part's dimensions.

Y Shift Checkbox

Select this if you require a Y Shift for the part's dimensions.

NOTE: Remember that an X or Y shift is based on the location of your fixture's origin, and the fact that the part's origin is always the corner closest to Machine Home. If the location point of the fixture is not in the part's corner closest to home, a shift will be required.

Z Fixture Adjust

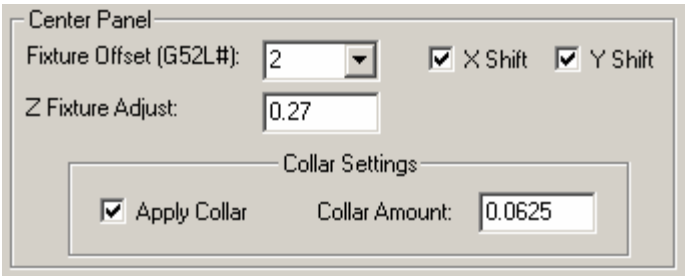
This is the distance from the bottom of the part to the top of the spoilboard.

Apply Collar Checkbox

Select this if you want to cut a collar in the panel. This is an offset amount from the origin of your fixture, as the illustration shows:

Collar Amount

Enter the amount of collar desired.



Perimeter/Profile Settings

Perimeter/Profile

This section allows the information to be set to trim, true and complete your job. The options available are:

Fixture Offset (G52L#)

This is the number code that defines the tool offset.

X Shift Checkbox

Select this if you require an X Shift for the part's dimensions.

Y Shift Checkbox

Select this if you require a Y Shift for the part's dimensions

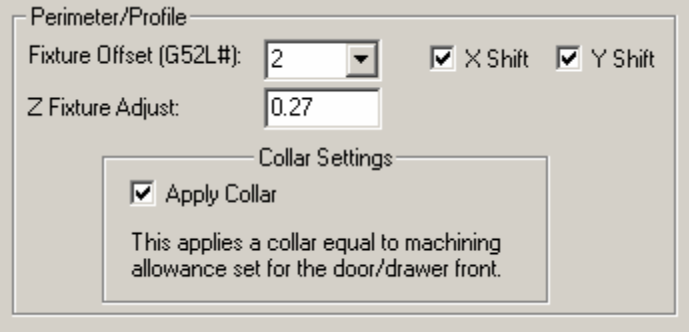
NOTE: Remember that an X or Y shift is based on the location of your fixture's origin, and the fact that the part's origin is always the corner closest to Machine Home. If the location point of the fixture is not in the part's corner closest to home, a shift will be required.

Z Fixture Adjust

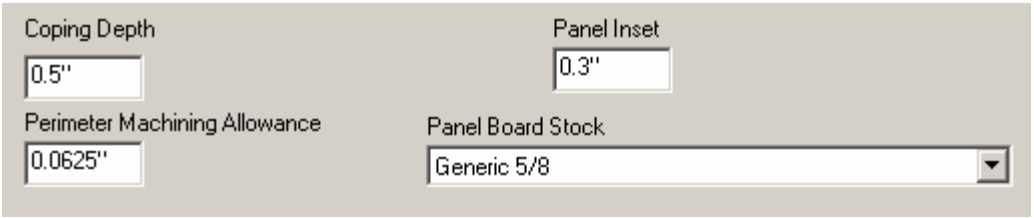
This is the distance from the bottom of the part to the top of the spoilboard.

Apply Collar Checkbox

Select this if you want to cut a collar in the completed door.



NOTE: The collar distance will be equal to the "Perimeter Machining Allowance" as shown on the "Sizing Details for Cut List" screen:



Help

Help Menu

About

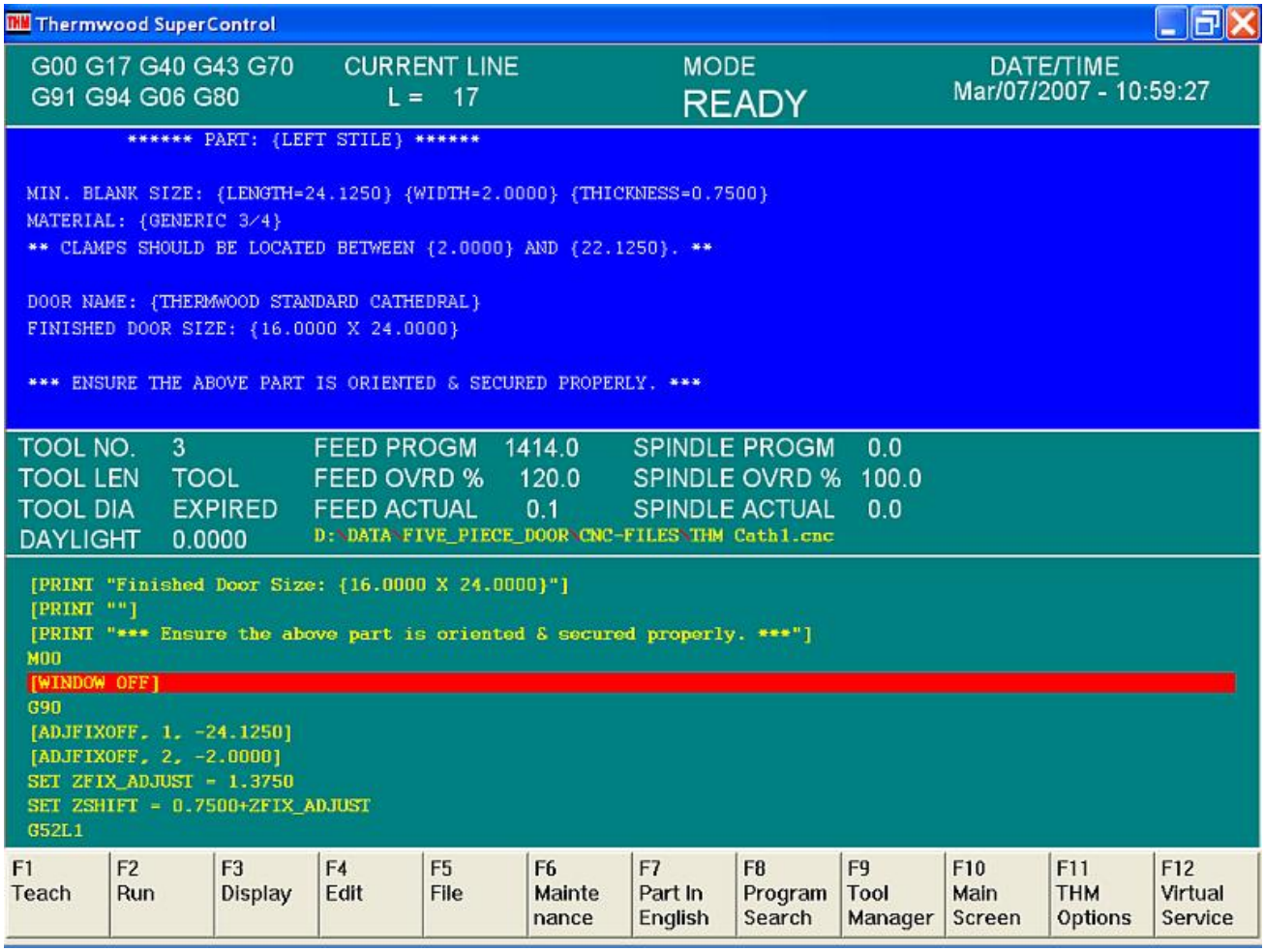
This feature shows details about the program and its revision level.

Running the CNC

When you have written the CNC file, the program is loaded and ready to run.

NOTE: At this time, the CNC file is loaded into the SuperControl, and will be ready to run. Confirm that any offset locations, tooling, daylight values, etc. are set properly before executing this program!

Pressing the **START** button on the SuperControl will execute the program, and you will immediately see the following screen display.



After the first part has run, you will then see additional information in the blue area of the SuperControl menu, alerting you that the next part is ready to be run.

```
        ****** PART: {CENTER PANEL} ******

MIN. BLANK SIZE: {LENGTH-20.7250} {WIDTH-12.7250} {THICKNESS-0.6250}
MATERIAL: {GENERIC 5/8}

DOOR NAME: {THERMWOOD STANDARD CATHEDRAL}
FINISHED DOOR SIZE: {16.0000 X 24.0000}

*** ENSURE THE ABOVE PART IS ORIENTED & SECURED PROPERLY. ***
```

And again, new information will appear in the blue area, until the door job is completed.

```
        ****** PART: {PERIMETER} ******

MIN. BLANK SIZE: {LENGTH-24.0000} {WIDTH-16.0000} {THICKNESS-0.7500}
MATERIAL: {GENERIC 3/4}

DOOR NAME: {THERMWOOD STANDARD CATHEDRAL}
FINISHED DOOR SIZE: {16.0000 X 24.0000}

*** ENSURE THE ABOVE PART IS ORIENTED & SECURED PROPERLY. ***
```

Glossary

B

bead: A rounded, raised profile, that is machined along the edge of a board.

C

collar: Distance that the finished door is offset from the origin of the fence. This allows for any edge irregularities to be accounted for before the final perimeter machining pass.

cope: Coping is when the shape of one part is matched to the mating end of another part. Literally, the "mirror image" of it, while allowing for fitting tolerances. In this case, where the rails and stiles meet.

D

daylight: Refers to the distance from the tip of the bit to the surface of the spoilboard.

E

eCabinet Systems: Thermwood Corporation's software that is provided to eCabinet Systems Members at no cost. It is a program established for custom cabinet and furniture design and manufacturing shops. It features full "3-D" design capabilities for completing jobs including cabinet boxes, dovetail drawers, doors (either MDF or five-piece raised panel designs), and face frames. It then enables you to send the job to a Thermwood CNC router where all these parts can be machined. The Thermwood CNC control takes the job from the software and creates the nested based programs needed to make all the part. Additionally it integrates your designs with suppliers and manufacturers of hardware, moldings, finishes and even other designers. There, you can collaborate and offer for sale your own successful projects, or browse a library of projects from other designers.

G

G52L#: Machine code for "Fixture Offset". This redefines the part's zero, relative to the machine HOME. Replace the "#" with the actual value number. Note that this code will NOT perform any machine motion.

L

lead in: An extra line programmed into the toolpath leading into the actual cut path of the part. This is especially needed for tooling that will perform undercuts. If you start a tool with an undercut directly on the part's finished path, it would destroy the part at the plunge location.

lead out: An extra line programmed into the toolpath leading past the actual cut path of the part. This is especially needed for tooling that will perform undercuts. If you end a tool with an undercut directly on the part's finished path, it would destroy the part at the retract location.

P

panel: The center piece of wood in the door. It is allowed to "float" freely between the styles and rails. This allows the natural expansion and contraction of the wood to occur without causing any cracking or distortion of the door. Panels can be flat or raised, depending on the design.

plunge: Downward vertical movement of the tool.

profile: The pattern that is machined into the outer edges of the door.

R

rail: The horizontal member of the door. In an arched or cathedral door, the upper rail is machined to achieve the required appearance.

raise: The cutting of the pattern in the center panel.

rough pass: A preliminary pass (or multiple passes) of the tool over the part, that ensures a clean face for the final machining pass.

S

stile: The vertical members of the door frame.

SuperControl: Thermwood Corporation's high performance, CNC control system that is configured to perform multiple axis motions simultaneously. It is a multi-processor system with full multi-tasking capabilities. It is provided with all Thermwood CNC router machines.

T

TWD file: Thermwood Corporation's database file for connecting eCabinet Systems CNC information to their line of CNC routing machines.

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