

# A Chiefwoodworker Plugin

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*All Things Woodworking*

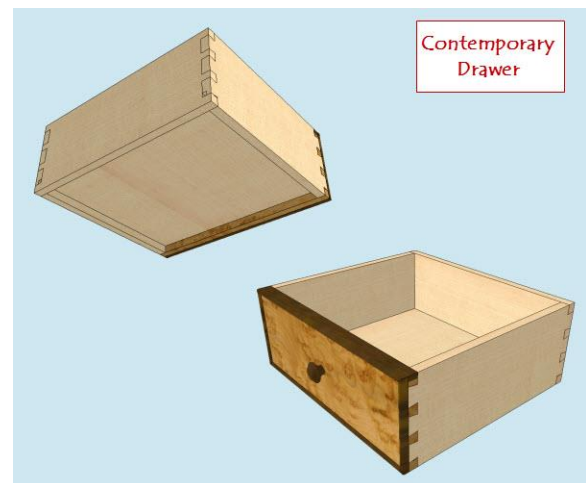
## Dovetailed Components – A Chiefwoodworker SketchUp Ruby Script

Dovetailed Components simplifies the modeling of furniture or cabinet drawers, or other subassemblies that require a dovetailed tail board, by automatically drawing the tail component of these subassemblies. Dovetailed Components creates the left Drawer Side component of a traditional or contemporary drawer, or Tail Board; including front and back tails and dado for the drawer bottom to ride in. A Left Drawer Side or Left Tail Board instance is placed at the model's origin. This instance can be copied, placed and mirrored (flipped) to create the Right Drawer Side or Tail Board. From there the front and back can be easily created using the Intersect Faces (free version of SketchUp) or Solids tools (Pro version). You can [download the construction plus.zip file here](#).



### *Traditional Drawer*

A traditional drawer is one where the bottom is generally made of hardwood. Hardwood must be allowed to expand & contract. In the traditional drawer design this is accomplished by letting the bottom expand and contract below, and past, the drawer back. Groves, or dados, are milled into the drawer sides and front to support the bottom. Because the bottom is constantly expanding and contracting with seasonal humidity and temperature changes, the bottom is generally tapered to reduce friction and wear. Unlike the contemporary drawer, the front and back tails of the traditional drawer side are never mirror images of one another. For a detailed description of the traditional drawer and how to craft it see the below two links:



[The Design & Construction of a Traditional Drawer](#)  
[The Crafting of a Traditional Drawer](#)

### *Contemporary Drawer*

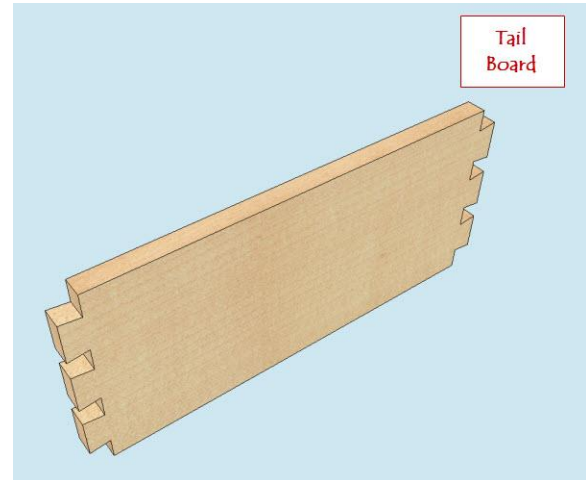
A contemporary drawer is one where the bottom is generally plywood. Plywood does not expand or contract (the design of plywood manages stresses built up inside which cancel each other). Therefore

the contemporary drawer does not need to allow for expansion or contraction; hence the bottom is completely enclosed by dados. Since there is no expansion or contraction, the bottom does not require tapering either. The back and front tails may or may not be mirrored images of one another, depending on the designer's preferences.


In either case, traditional or contemporary, this tool draws the appropriate tails and dado to the user's specifications and creates a component that can be copied, mirrored and used in SketchUp to create drawer fronts and backs with the Intersect Faces or Solids tools.

### Tail Board

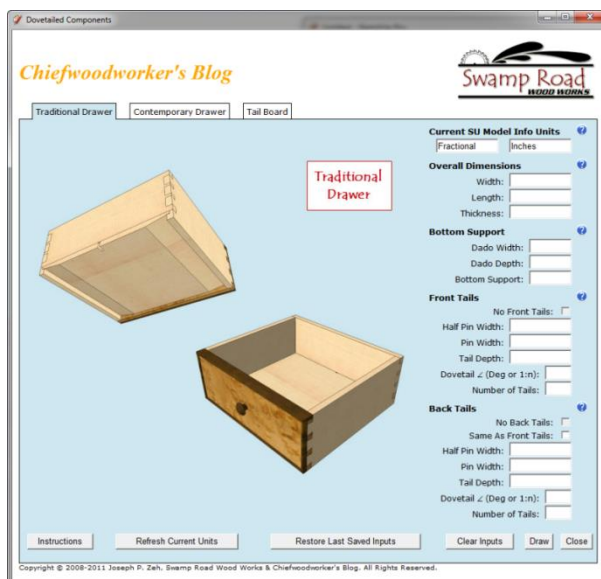
A tail board is simply a board with tails at one or both ends. Examples of the use of a tail board are: the side of a tall clock bonnet, the feet of a Shaker cabinet or the top of a chest of drawers. Tails at each end may be mirror images of one another or different. This tool allows for tails at either end only, both ends, or neither end (a roundabout way to model a board).




## How to Use Dovetailed Components

Dovetailed Components is one in a set of tools I distribute in a ZIP file. When extracted to the SketchUp Plugins folder this set of tools can be accessed by enabling the Construction Plus toolbar on the View/Toolbars menu. Dovetailed Components has a tool icon that looks like this: 

**IMPORTANT:** When using this tool make sure there are no primitives (edges or faces not part of a component or group) on Layer0 near the origin, lest they will become part of the Drawer Side or Tail Board component.



Read and heed any warning or error messages. If you are warned that the saved SU Model Info Units do not agree with the current units, correct the situation by changing the current settings in Window/Model Info/Units and then click the Refresh Current Units button before using the saved inputs.

When you select the Dovetailed Components tool by clicking on its icon , a window will open. If your screen resolution is too small for the window a message will instruct you to close the tool and reopen it. This is a onetime adjustment, unless you change screen resolution in the future. When you reopen the tool the window will appear with scroll bars.

The first time you open Dovetailed Components it will look like the picture left, above, with the Traditional Drawer tab selected. All inputs will be blank.

Start by selecting the tab for the type of component you wish to draw: Traditional Drawer; Contemporary Drawer; or Tail Board. You will notice that as you select tabs the illustrative picture will change to reflect the tab you have chosen. This will also be true as you move between inputs. As you place your cursor in each input's white space an appropriate picture will be displayed. This picture will guide you as you fill in the form; it will give you a graphic definition of each input. Start filling in the user inputs at the top and work your way down (this is not necessary but good practice).

When you have completely filled in the inputs click the Draw button and the Dovetailed Components window will close leaving you a constructed drawer side or tail board in your model.

### ***Button Behavior***

Instructions – Produces a message similar to, but shorter than what has preceded in this document. Press the close button in the message window to exit the message.

Refresh Current Units – Rereads the current Window/Model Info/Units settings in SketchUp and updates Current SU Model Info Units in this tool.

Restore Last Saved Inputs – Each time the Draw button is clicked the user inputs are saved provided there are no error messages. When the Dovetailed Components window next opens these inputs are restored. Should you make changes and decide to abandon them, simply click Restore Last Saved Inputs to bring back the last saved inputs.

Clear Inputs – Clears all user inputs and erases the last saved user inputs cookie.

Draw – Check the completeness and validity of all inputs and if successful saves the inputs, constructs the drawer side or tail board component and closes the Dovetailed Components tool window.

Close – Closes the Dovetailed Components tool window. User inputs are not saved. When the next Dovetailed Components tool window opens the previously saved inputs will be restored.

### ***Current SU Model Info Units***

Shown under Current SU Model Info Units are the Format and default dimensional units specified by SketchUp in its Window/Model Info/Units dialog box. It is important that the user supplied inputs (or the previously saved and restored inputs) are consistent. If not, the user should change either the SketchUp settings or the user inputs to make them consistent.

If you change the SketchUp settings be sure to click the Refresh Current Units button to update the Drawer Side window. Remember, any user inputs that do not contain a dimensional unit will be assigned the default unit specified in SketchUp's Window/Model Info/Units dialog box.

### ***Overall Dimensions***

There are three drawer side or tail board dimensions required: The overall width of the drawer side or tail board, including the support for the bottom; the overall length of the drawer side or tail board measured from tail end to tail end; and the thickness of the drawer side or tail board. Be sure the dimensions you enter are consistent with the Current SU Model Info Units. If you leave a dimensional unit off, the dimensional units specified by the current SU units are assumed.

### **Bottom Support**

The drawer bottom support consists of two drawer side parts: That part which is the dado, sized to receive the drawer bottom; and the material below it which supports the weight of the drawer bottom and drawer contents. The depth of the dado is typically one half the width of the board, though that is not a hard and fast rule. The bottom support is sized to support the weight of the bottom and drawer contents, and also to extend somewhat below the drawer bottom providing clearance for it. In most traditional drawer designs the bottom is  $\frac{1}{2}$ " thick and beveled at its side and front edges. The dado is  $\frac{1}{4}$ " high and  $\frac{1}{4}$ " deep. The bottom support is typically  $\frac{1}{2}$ " providing a  $\frac{1}{4}$ " clearance. However, as mentioned, these dimensions are typical and not a rule.

Tail boards do not have a dado. When the Tail Board tab is selected Bottom Support inputs will be greyed out and disabled.

### **Front Tails**

Front Tails inputs define the front tails. Half Pin Width is the dimension from the edge of the drawer side or component to the outer most vertex of the tail. The Half Pin Width is assumed to be the same on both edges of the component. The Pin Width is the distance between tails at the outer most end edges. Tail Depth is determined by the thickness of the front pin board, or the depth to which the tails will enter a blind dovetail drawer front. The Dovetail Angle can be input in degrees from 5 to 15, or as a rise:run ratio from 1:3 to 1:10. Number of Tails must be an integer from 1 to 99.

If the Tail Board tab is selected the user can check No Front Tails to draw a Tail Board with only back tails. Doing so disables and greys out the Same As Front Tails check box under Back Tails.


### **Back Tails**

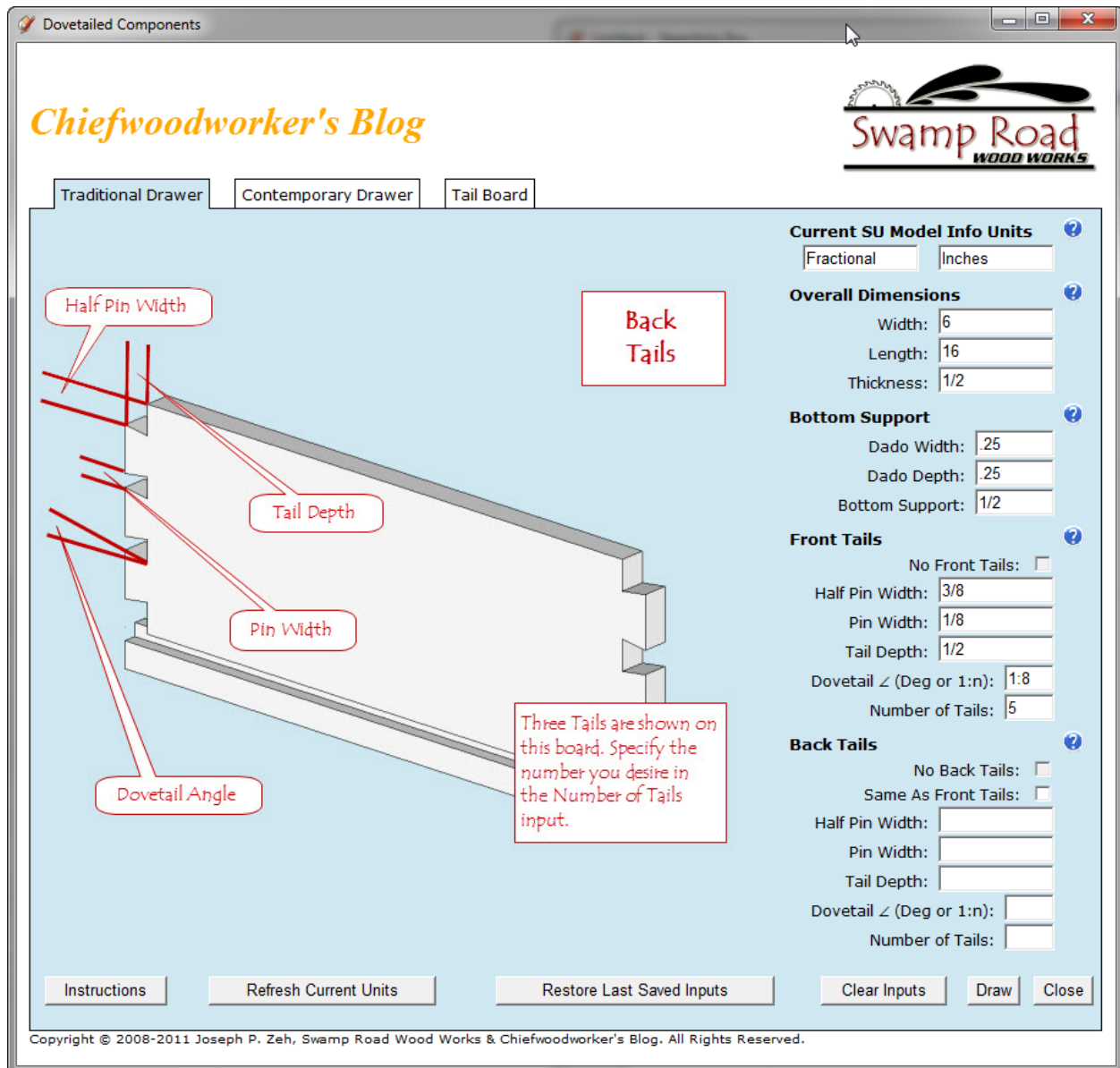
Back Tails inputs define the back tails. Half Pin Width is the dimension from the edge of the component to the outer most vertex of the tail. The Half Pin Width is assumed to be the same on both edges of the component. The Pin Width is the distance between tails at the outer most end edges. Tail Depth is determined by the thickness of the back pin board. The Dovetail Angle can be input in degrees from 5 to 15, or as a rise:run ratio from 1:3 to 1:10. Number of Tails must be an integer from 1 to 99.

If the Tail Board tab is selected the user can check No Back Tails to draw a Tail Board with only front tails. Same As Front Tails, when checked, uses the Front Tails inputs for the Back Tails.

Note: It is possible to produce a tail board with no front tails and no back tails by checking both No Front Tails and No Back Tails check boxes when the Tail Board tab is selected; though not the most efficient way to draw a simple board.

### **Help Buttons**

Next to each input category is a Help button . Press this button and you will get a category explanation very similar to what is given in this document. When you have finished reading the help message click its Close button and continue.



## An Example Drawer Side

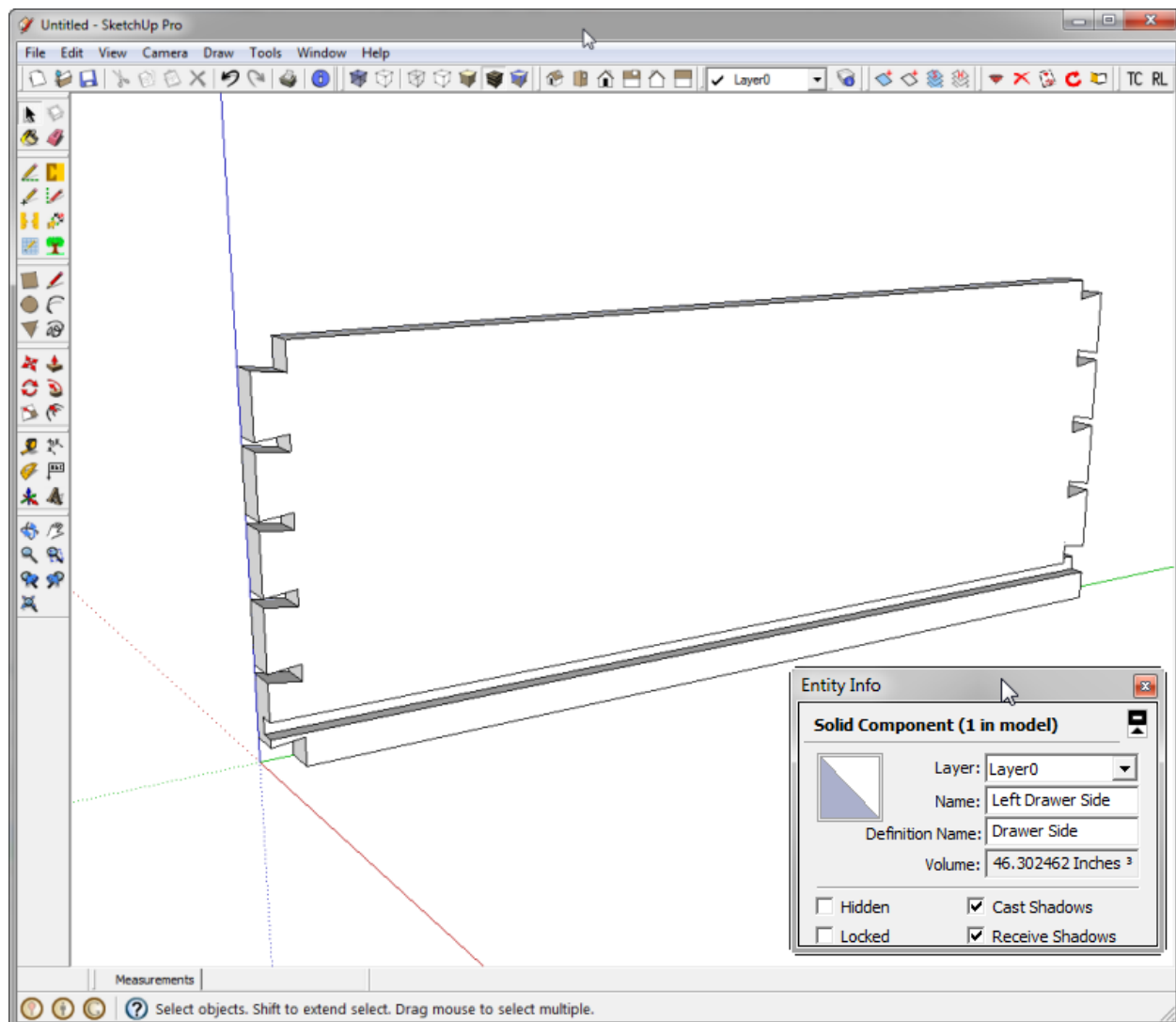
Let's give Dovetailed Components a test drive. I'm a hobbyist woodworker who builds fine furniture, almost entirely for my family. I don't have to worry about cost or build time so I like traditional drawers. The drawer I have in mind has a side 6" wide, 16" long and is 1/2" thick.

In the picture above I have filled in all inputs except the Back Tails so that I can point some things out. Notice that Current SU Model Info Units is telling me that SketchUp's default units setting at the time I opened the tool's window was inches. It is possible I changed SketchUp while the window was open and it is no longer inches. I can check by clicking the Refresh Current Units button, a good thing to do just before hitting the Draw button.

Note that I have mixed inputs; some are fractions and some are decimals. It doesn't matter which you use when inputting Imperial units. For metric unit decimals are required. See the section on valid units at the end of this document.

I have specified the dovetail angle as a ratio of 1:8. Most dovetail markers you purchase for your shop have typical ratios printed on them. 1:8 is typical for hardwoods and is roughly 7°.

There are a couple of things that are not clearly visible in the picture above. The first is that No Front Tails and No Back Tails is greyed out and disabled. The reason is obvious; drawer sides require tails at both ends. The second is that my cursor is in the Back Tails Half Pin Width input field. The moment I placed it there the picture changed to Back Tails and it is showing me everything I need to know to enter the required information.

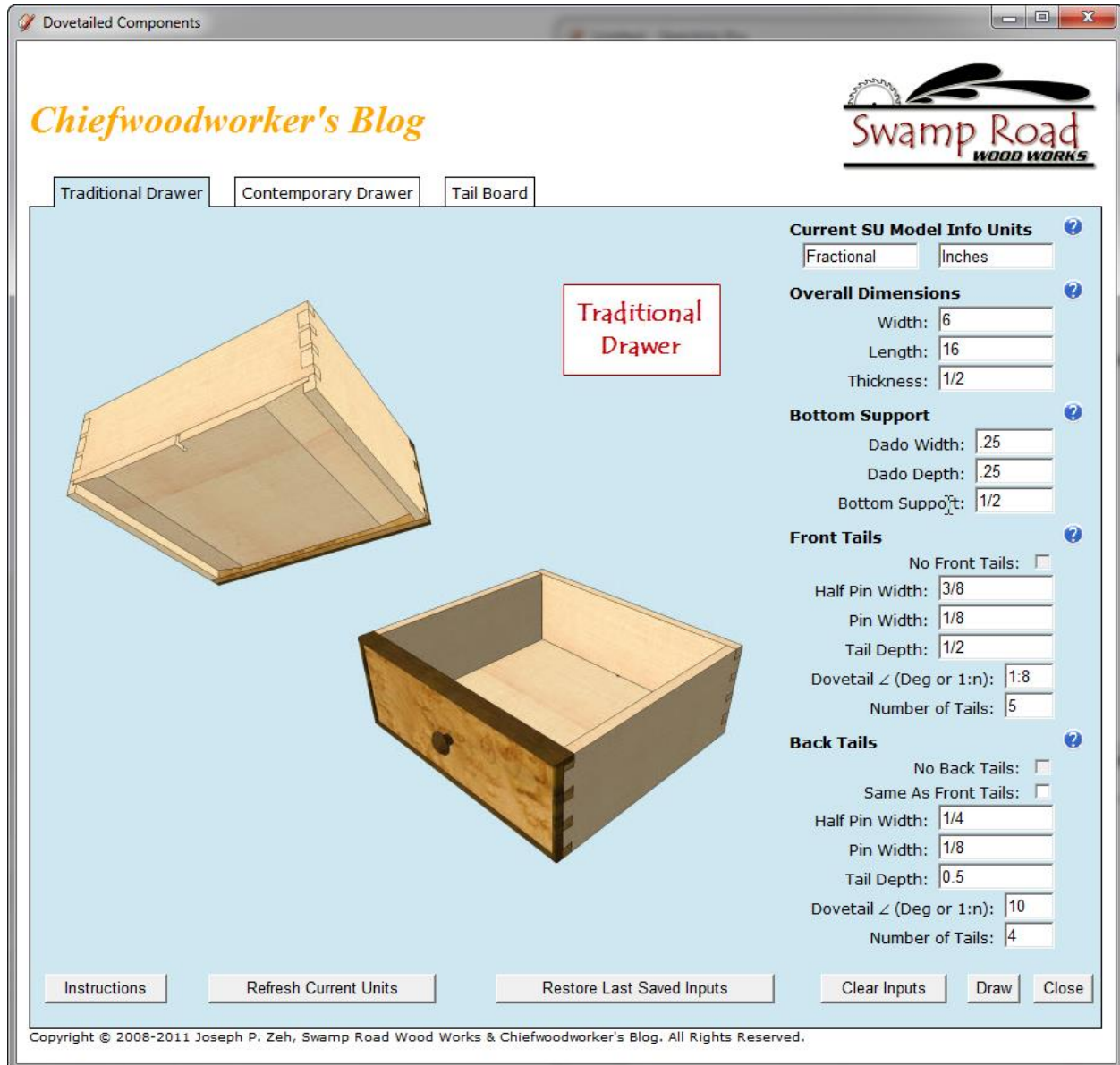




Now I will finish entering the data as follows:

Half Pin Width:  $\frac{1}{4}$ " – Less than the  $\frac{1}{8}$ " used on the front tails.  
 Pin Width:  $\frac{1}{8}$ "  
 Tail Depth: 0.5"  
 Dovetail Angle:  $10^\circ$  - no  $^\circ$  unit  
 Number of Tails: 4 – one less than the front

Once I have entered these inputs, and clicked the Draw button, the Dovetailed Components window closes and my drawer side appears in the SketchUp window shown at the bottom of Page 6.



Notice in the Entity Info box that the tool assigned it a component Definition Name of Drawer Side and an instance Name of Left Drawer Side. If the name Drawer Side is already in use it will name it Drawer Side#1 or some number that makes it unique. You can see that this component is a Solid Component

indicating that for those with the Pro version you can use the Solids tools to create the front and back pin boards. For the free version users – sorry – you have to use the Intersect Faces tool.

Looking at this drawing I can see that the choice of a Front Tails Half Pin Width of 3/8" moved the tails bottom edge perilously close to the dado. I may want to redraw this component. No Problem! I simply delete this part, choose the tool again, note that it opens and restores all my settings and now all I have to do is change 3/8" to 1/4" and click Draw again. Piece of cake! The picture at the bottom of Page 7 shows the window after I selected the tool again.

You can see that the inputs have been restored, including the tab selection.

I hope you find this tool useful.

Joe.....

aka Chiefwoodworker



## Appendix: Valid Inputs and Units Use

Dovetailed Components is flexible on the type of inputs used. It essentially uses the same rules as SketchUp itself.

### Imperial Units

The input string may require units, for example 3' 7 1/64" is a valid input. Beware, the SketchUp default Units will be appended where not supplied. The following are the only valid inputs:

D"	or	D'	or	D
i"	or	i		
n/d"	or	n/d		
i n/d"	or	i n/d		
f'	or	f		
f' i"	or	f' i		
f' n/d"	or	f' n/d		
f' i n/d"	or	f' i n/d		

Where i, n, d, and f must be non-zero integers whose leading digit also is not a zero, e.g. 0123 is invalid. D is a decimal number and the first digit cannot be a zero unless the decimal point is immediately to its right. When a unit is not supplied the current SketchUp default Units will be appended.

### Metric Units

The input string requires one, and only one, unit; m, cm or mm.  
The following are the only valid inputs:

i  
im  
icm  
imm  
d  
dm  
dcm  
dmm

Where i is an integer whose first digit cannot be a zero; Where d is a decimal number and the first digit cannot be a zero unless the decimal point is immediately to its right. When a unit is not supplied the current SketchUp default Units will be used.