



KEYCREATOR[®]

TIPS AND
TRICKS

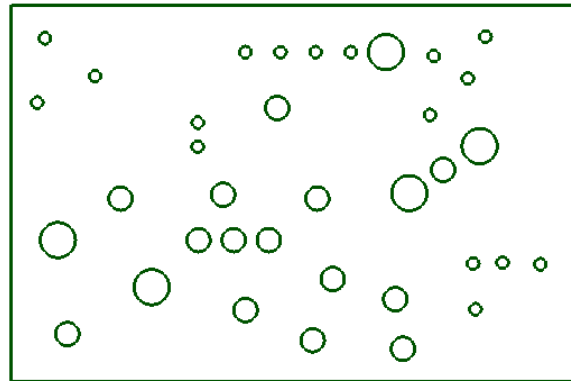


Doctor Walt's Tips and Tricks # 40

Hole Tables

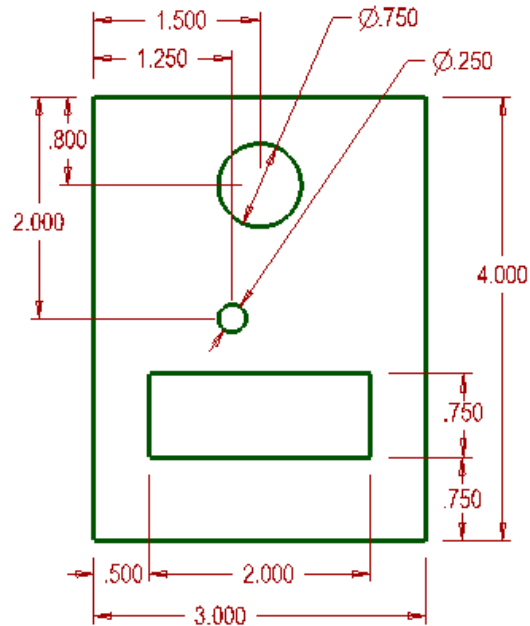
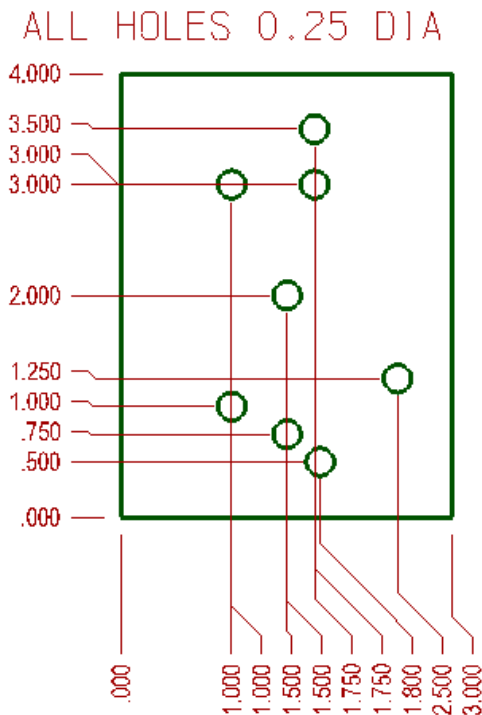
We cover some pretty elaborate modeling topics in Tips and Tricks. While modeling surfaces and complex solids is dramatic, I don't want to forget our many users who spend large amounts of time managing more mundane CAD geometry. In this case, I'm referring to our old friend, the hole!

For this exercise, the file "LotsOfHoles1" is available for download. If for some reason you can't access the file, you can quickly create a flat drawing with a large rectangle that has the bottom left corner positioned at the origin (0,0,0.) Then, create holes in three different diameters, spread out within the borders of the rectangle.



The file "LotsOfHoles" should look like the illustration above when you open it up.

Now drawings with less geometry are typically dimensioned using linear dimensions or in some cases ordinate dimensions. Two typical examples are shown below.

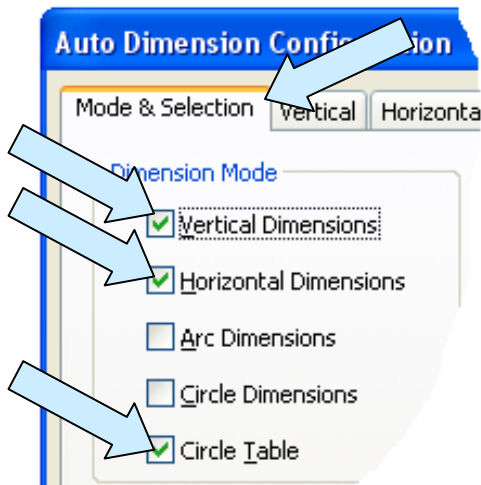
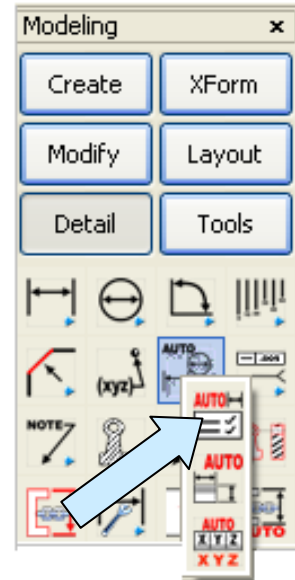


If you get a situation where you have a large number of holes on a drawing, using these dimensioning approaches will kill you! In these cases, a hole table provides a much cleaner alternative. Let's look at two different tools that create hole tables. Each approach has some distinct advantages.

The Auto-dimensioning Function

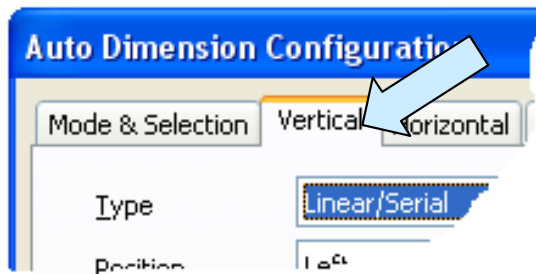
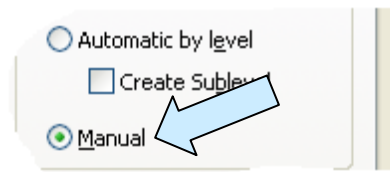
First, click on the CONFIGURE AUTO-DIMENSIONING Icon.

A Dialog Box appears.

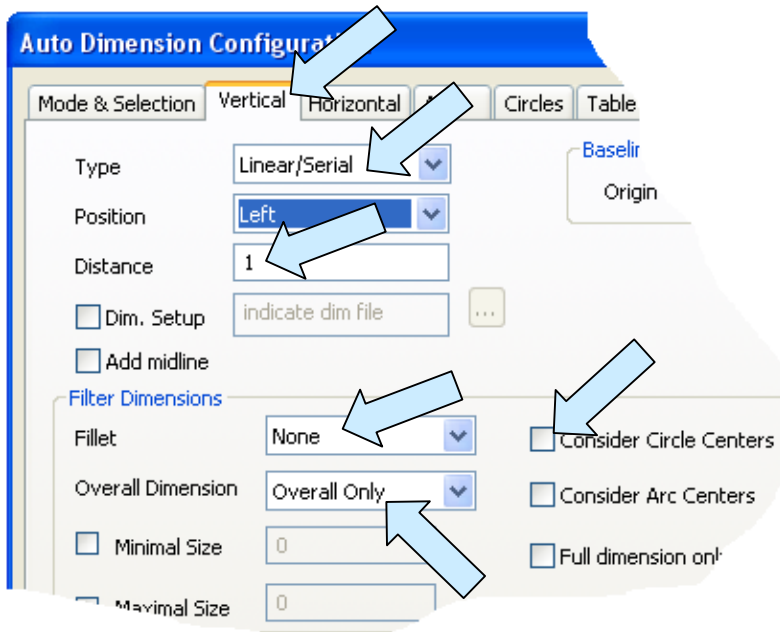


With the Mode & Selection Tab enabled, let's click on the Vertical Dimensions, Horizontal Dimensions, and Hole Table Options. (This function can be used to create both a hole table and other dimensions all at once.)

You'll also want to select the Manual Option on the right side of the Dialog Box.



Next, click on the Vertical Tab at the top of the Dialog Box.



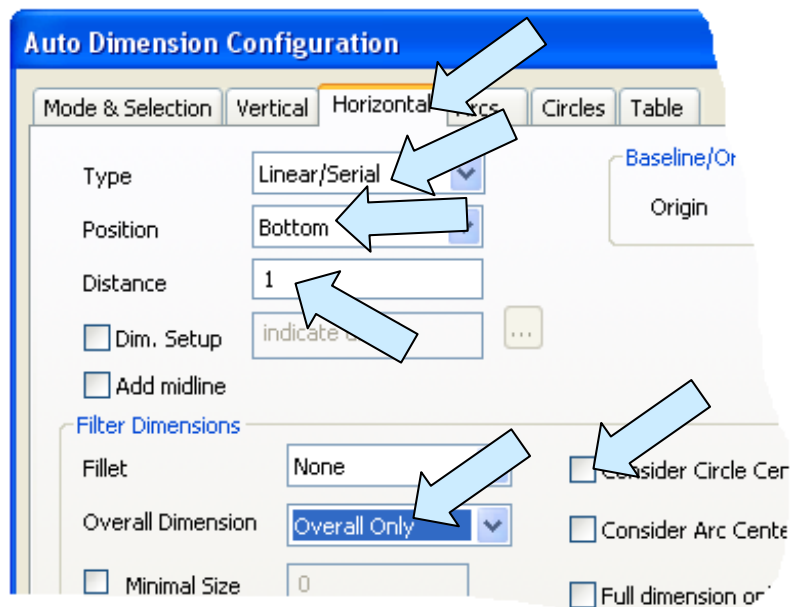
Here you can set the options for vertical dimensions on the drawing.

Select Linear/Serial, a distance of 1, None for Fillet, and Overall Only.

Since we are going to generate a hole table, do NOT select Consider Circle Centers.

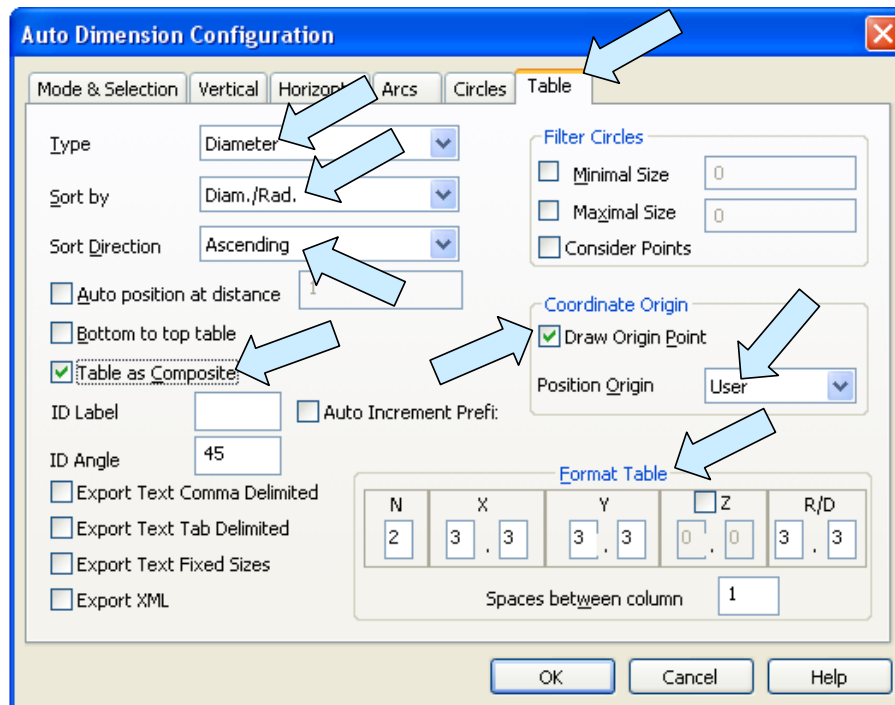
Next, click on the Horizontal Tab.

We'll use similar settings here.



Finally, click on the Table Tab.

Here, you can format how the table will look.



The Type, Sort By, and Sort Direction Options are self-explanatory. Making the table a composite is a good idea since you can then use the Generic Move Function to adjust the table position as you finish up your drawing.

Drawing an Origin Point should be checked and selecting User for the Position Origin let's you specifically define the origin for hole location dimensions.

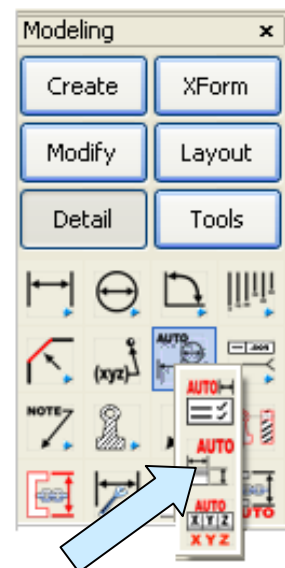
The numbers in the Format Section control number of decimal places for the values.

Click on the OK Button when you are done.

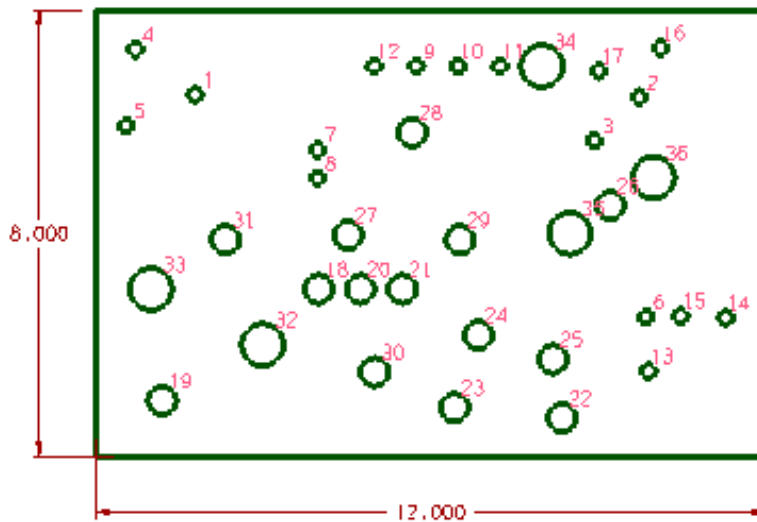
Now, click on the AUTO DIMENSION Icon. Click on the ALL DSP Option and then the ALL Option. Then, hit the ENTER Key.

Using the EndEnt Option, click on the bottom, left corner of the rectangle.

Then, using the Cursor Option, click to the right of the rectangle to place the hole table.



Your drawing should now look like this:



.	X	Y	D...
1	1.793	6.488	0.250
2	9.746	6.439	0.250
3	8.939	5.664	0.250
4	0.722	7.296	0.250
5	0.558	5.928	0.250
6	9.862	2.500	0.250
7	3.983	5.500	0.250
8	3.983	4.989	0.250
9	5.750	7.000	0.250
10	6.500	7.000	0.250
11	7.250	7.000	0.250
12	5.000	7.000	0.250
13	9.911	1.528	0.250
14	11.294	2.484	0.250
15	10.487	2.517	0.250
16	10.125	7.329	0.250
17	9.022	6.917	0.250
18	4.000	3.000	0.500
19	1.200	1.000	0.500
20	4.750	3.000	0.500
21	5.500	3.000	0.500
22	8.363	0.688	0.500
23	6.436	0.869	0.500
24	6.865	2.171	0.500
25	8.198	1.742	0.500
26	9.219	4.494	0.500
27	4.526	3.967	0.500
28	5.679	5.813	0.500
29	6.535	3.885	0.500
30	5.004	1.512	0.500
31	2.336	3.885	0.500
32	3.000	2.000	0.750
33	1.000	3.000	0.750
34	8.000	7.000	0.750
35	8.500	4.000	0.750
36	10.000	5.000	0.750

Note that the holes are labeled and the hole diameters and X, Y positions are documented in the table.



You can use the GENERIC MOVE Function to adjust Hole labels that might be confusing where one hole is close to another.

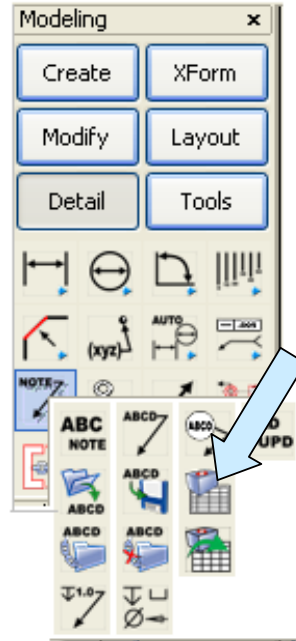
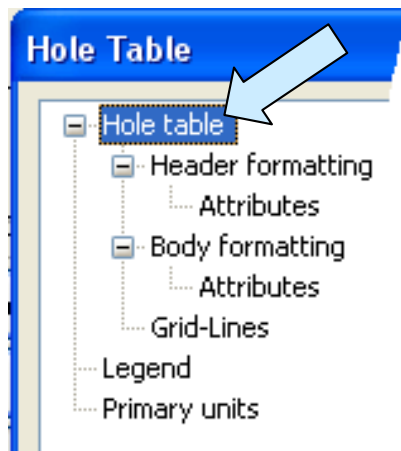
When you are done experimenting, delete all of the details (Table, labels, dimensions) from the drawing, leaving the original rectangle and holes.

The Hole Table Function

Let's create a hole table using a completely different function in KeyCreator.

Click on the HOLE TABLE Icon.

A large Dialog Box appears.

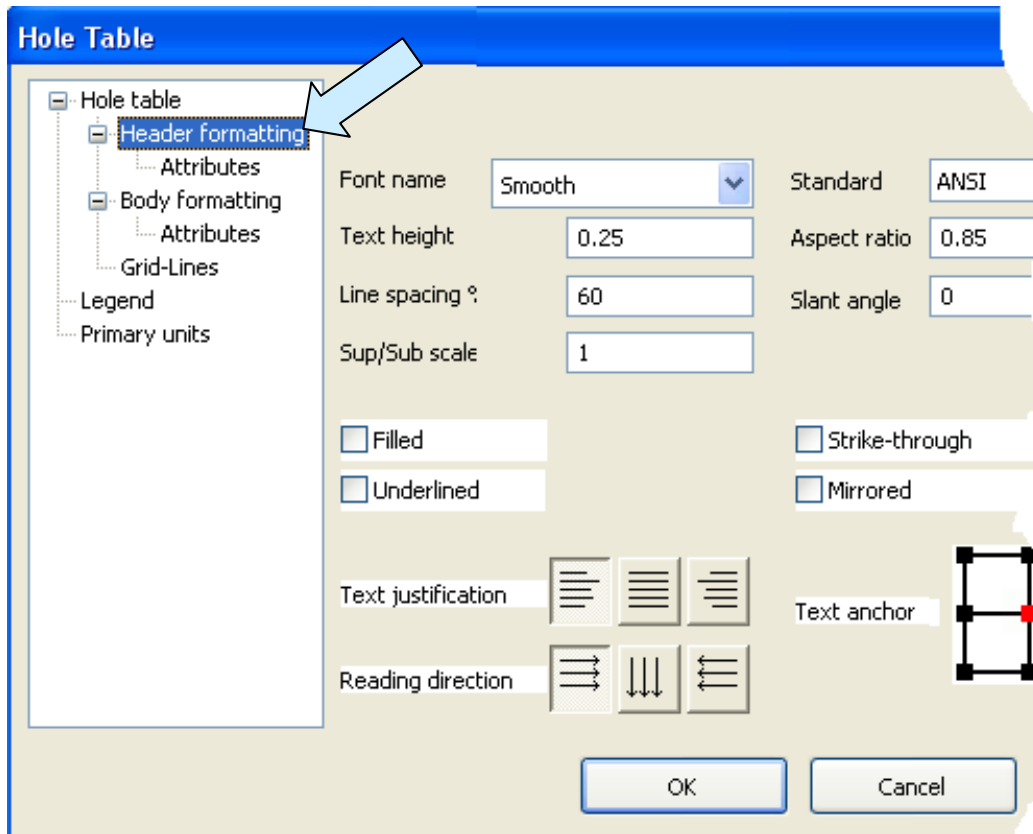


Click on the Hole Table option in the left side of the Dialog Box.

Notice that you get a large selection of options for configuring the table. (We'll use the defaults, except for the label distance. Make that 300.)

Table type	Diameter	<input checked="" type="checkbox"/> Sort group sizes ascending				
Primary sort value	X col	<input checked="" type="checkbox"/> Ascending				
Secondary sort value	Y col	<input checked="" type="checkbox"/> Ascending				
Starting letter	A	<input checked="" type="checkbox"/> Blank row between groups				
Hole label angle	135	<input checked="" type="checkbox"/> Add Target at table origin				
Hole label distance	100	<input checked="" type="checkbox"/> Label distance as % hole radius				
Column display and minimum widths (columns will expand to fit the data)						
Hole	From	X	Y	Z	Depth	Size
0.1	0.1	0.1	0.1	0.1	0.1	0.1
Column spacing	1		Row spacing	1		

Click on the Header Formatting Option on the left side of the Dialog Box.
You'll get a wide assortment of options to customize the table header.



The Body Formatting Option will give you similar options.
Clicking on the Primary Units Option let's you select the number of decimal places used for table data.

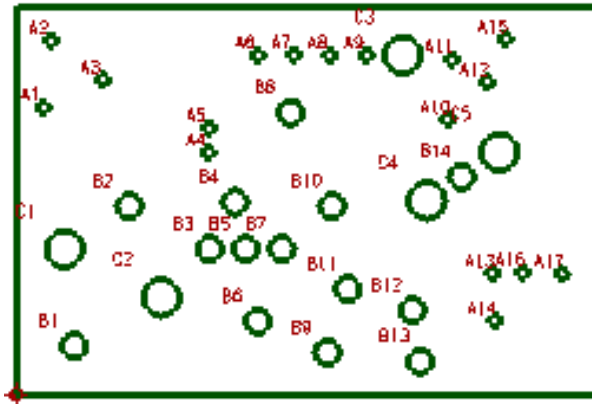
Click on the OK Button.

Click on the ALL DISP Option and then on the ALL Option.
Hit the ENTER Key.

Using the EndEnt Option, click on the bottom, left corner of the rectangle to set the reference position for the Hole Table.

Then, using the Cursor Option, click to the right of the rectangle to place the hole table.

Notice that this hole table is structured differently from the one we created earlier with the Automatic Dimension Function.

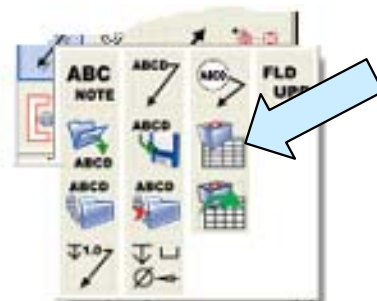


Hole	From	X	Y	Z	Depth	Diameter
A1	X,Y	.558	5.028	.000		.250
A2	X,Y	.722	7.296	.000		.250
A3	X,Y	1.793	6.488	.000		.250
A4	X,Y	3.983	4.980	.000		.250
A5	X,Y	3.983	5.500	.000		.250
A6	X,Y	5.000	7.000	.000		.250
A7	X,Y	5.750	7.000	.000		.250
A8	X,Y	6.500	7.000	.000		.250
A9	X,Y	7.250	7.000	.000		.250
A10	X,Y	8.939	5.664	.000		.250
A11	X,Y	9.022	6.917	.000		.250
A12	X,Y	9.746	6.430	.000		.250
A13	X,Y	9.882	2.500	.000		.250
A14	X,Y	8.911	1.528	.000		.250
A15	X,Y	10.125	7.329	.000		.250
A16	X,Y	10.487	2.517	.000		.250
A17	X,Y	11.294	2.484	.000		.250
B1	X,Y	1.200	1.000	.000		.500
B2	X,Y	2.336	3.885	.000		.500
B3	X,Y	4.000	3.000	.000		.500
B4	X,Y	4.526	3.987	.000		.500
B5	X,Y	4.750	3.000	.000		.500
B6	X,Y	5.004	1.512	.000		.500
B7	X,Y	5.500	3.000	.000		.500
B8	X,Y	5.679	5.813	.000		.500
B9	X,Y	6.436	.869	.000		.500
B10	X,Y	6.535	3.885	.000		.500
B11	X,Y	6.885	2.171	.000		.500
B12	X,Y	8.198	1.742	.000		.500
B13	X,Y	8.363	.688	.000		.500
B14	X,Y	9.219	4.494	.000		.500
C1	X,Y	1.000	3.000	.000		.750
C2	X,Y	3.000	2.000	.000		.750
C3	X,Y	8.000	7.000	.000		.750
C4	X,Y	8.500	4.000	.000		.750
C5	X,Y	10.000	5.000	.000		.750

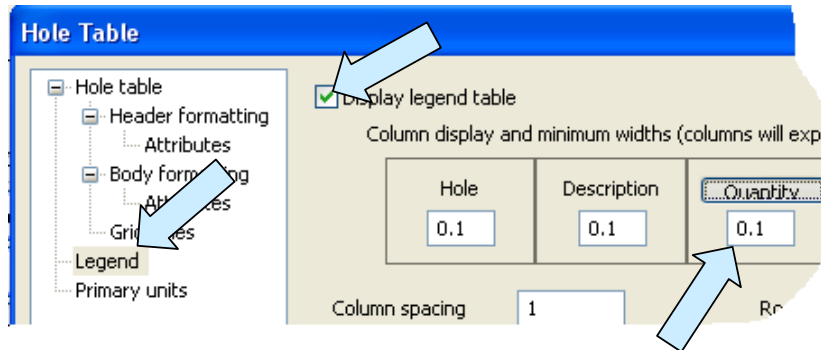


Click on the UNDO Icon to remove the details from the drawing.

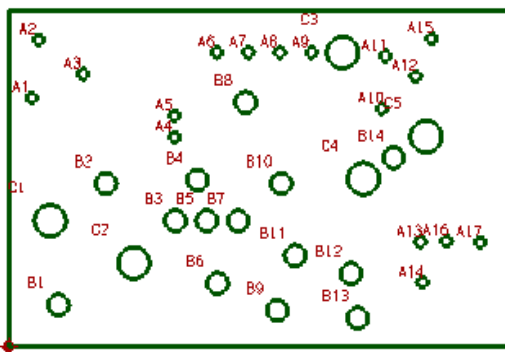
Click on the HOLE TABLE Icon again.



This time, click on the Legend Option on the left side of the Dialog Box. Select the Display Legend Table option. Then, click on the Quantity Option to activate it. Click on the OK Button.



Follow the same steps, selecting all of the display and using the bottom, left corner of the rectangle as the reference position.



Hole	Description	Qty.
A	∅ 0.250	17
B	∅ 0.500	14
C	∅ 0.750	5

Hole	From	X	Y	Z	Depth	Diameter
A1	X,Y	558	5 928	.000		.250
A2	X,Y	.722	7.296	.000		.250
A3	X,Y	1.793	6.488	.000		.250
A4	X,Y	3.983	4.989	.000		.250
A5	X,Y	3.983	5.500	.000		.250
A6	X,Y	5.000	7 000	.000		.250
A7	X,Y	5.750	7.000	.000		.250
A8	X,Y	6.500	7.000	.000		.250
A9	X,Y	7.250	7.000	.000		.250
A10	X,Y	8.939	5 664	.000		.250
A11	X,Y	9.022	6.917	.000		.250
A12	X,Y	9.746	6.439	.000		.250
A13	X,Y	9.862	2.500	.000		.250
A14	X,Y	9.911	1.528	.000		.250
A15	X,Y	10.125	7 329	.000		.250
A16	X,Y	10.487	2.517	.000		.250
A17	X,Y	11 294	2.484	.000		.250
B1	X,Y	1.200	1.000	.000		.500
B2	X,Y	2.336	3.885	.000		.500
B3	X,Y	4.000	3.000	.000		.500
B4	X,Y	4.526	3 967	.000		.500
B5	X,Y	4.750	3.000	.000		.500
B6	X,Y	5.004	1.512	.000		.500
B7	X,Y	5.500	3.000	.000		.500
B8	X,Y	5.679	5.813	.000		.500
B9	X,Y	6.436	.869	.000		.500
B10	X,Y	6.535	3.885	.000		.500
B11	X,Y	6.865	2.171	.000		.500
B12	X,Y	8.198	1.742	.000		.500
B13	X,Y	8.363	.686	.000		.500
B14	X,Y	9.219	4.494	.000		.500
C1	X,Y	1.000	3 000	.000		.750
C2	X,Y	3.000	2.000	.000		.750
C3	X,Y	8.000	7.000	.000		.750
C4	X,Y	8.500	4.000	.000		.750
C5	X,Y	10.000	5 000	.000		.750

Notice that in addition to the main hole table, you get a summary table with total hole count for each size hole. I recommend that you experiment with the various options available so you have more ammunition the next time you have to document a part with a large number of holes.