PADS PowerPCB Dynamic Drill Drawing Table D3T ver1.01
Help Notes 18.06.02

Purpose: Generates a drill drawing table in the current PCB design.
PPCB versions: 3.0x - 4.0x (ver2.x not tested)

Quick Run Notes

Before running the program:

1. A PCB design must be loaded.
2. An up-to-date NC Drill report must exist in the CAM subdirectory for the design.
3. The layer where the table is to appear is visible and enabled.

Once above has been verified (item#2 is very important):

4. Run the program (in menu: Tools/Basic Scripting/Basic Scripts/ select file, Run)
5. Adjust table parameters/values if required (mils only).
6. Select OK.
7. The program takes a few seconds to process then displays the DD table.
8. The table can be re-positioned by shift-select / ctrl-E.
9. Turn off old drill chart (File/CAM/drill_dwg_doc/Edit/Options/Drill Symbols/Draw Chart –check OFF

Note: only one table is normally permitted in the design -if using PPCB v3, you must delete the table if you re-run the program otherwise load errors will result. PPCB v4 will prompt to delete.

Note: the CAM Drill Symbol list is sorted and unused drills deleted (this function can be disabled with the Update CAM Symbol Table option). Other than loading 2d-Line and text items, no other modifications are made to the design or it's files.

Program Installation

Use standard VB script installation.
Copy or move the file D3T_101.bas to your PADS PowerPCB OLE directory (or another directory you may have set up for scripts) e.g. C: \PadsPwr\ole\ . In PowerPCB, select Tools/Visual Basic Scripting/Visual Basic Scripts/Load File –select D3T_101.bas in the browser window. Select In Menu in upper right to have it appear in the Tools/Visual Basic Scripting fly-out menu.

D3T Information Details

The D3T program is a PADS VB script which generates a drill drawing table composed of 2d-lines and text. It is dynamic in that it can be moved, accuractly positioned and edited in the design and is not tied to blind CAM processing.

Features:

- Drill drawing symbol list in CAM is automatically sorted.
- Unused drills automatically removed.
- Table data and order exactly matches the NC Drill report.
- Support for slotted holes (PPCB ver4 only).
- Generated table is fully scalable -controlled by text size.
- Separate specification for text and line width.
- Table is created as a combined drawing making it easy to move and edit.
- Column for NC Drill tool list.
- Column for drill tolerances (fully editable).
- Drill size and tolerance title headings are editable.
- Can appear on any layer.
- Support for separate plated/non-plated and blind and buried drill tables.
- Operates in mils, metric or inch units.
- Drill symbols are added sequentially without gaps.

Dialog Functions / User Controls:

Drill Drawing Header:
The drill drawing column header appears in this row. Only Size and Tolerance names can be edited. They can be of any length or any characters -these table columns when generated will automatically resize to accomadate the added text. Note: the Tool name also appears editable but is not supported.
Size examples: Size, SIZE (mils), SIZE - mm
Tol examples: TOLERANCE, +/- Drill Tol.

Tool and Tol Checkboxes:
Unchecking either of these boxes will disable the generation of that column data in the table. The corresponding title boxes and controls gray-out when checked off as an indicator. If Tool is checked off and Tolerance left on, the Tolerance column is shifted to the left to create a table without a gap or blank entries.

Table Data Listbox:
Below the title is the main listbox for the drill table. Drill information is gathered from the design and CAM report files, processed, sorted and tabulated here. If slotted pads appear in the design (PPCB ver4 and higher), they will be listed at the end of the table. If tolerance values are entered, they are also added in here. Note: The listbox is not exactly as it will appear in the generated table i.e. columns are properly spaced. You may also notice that the Pltd and Tool columns are a little 'wavy' -this is a limitation of the font (non-proportional) used in the VB dialog function.

Table Row Info Bar:
The grayed-out information bar below the list table is updated with the information for each selected row providing a display summary.

Tolerance Edit Box:
To the right of the Info Bar, the Tolerance Edit Box provides entry of tolerance values. Any character or string length can be entered. Windows edit functions Copy and Paste are also applicable. To enter or edit a value, select the row in the table,

enter a value in the Edit Box and press the Update button below. Note: All entries do not need to be filled. If no entries are made, the column will be blank with a width based on the Tolerance title.
Example tolerance values: +/-0.003, +0.005/-0.000, +/-0.125mm

Tolerance Fill Button:
The value in the Tolerance Edit Box is used to fill the Tolerance column when the Fill button is pressed.

Update Tolerance Field Button:
Enters the value in the Tolerance Edit Box into the selected drill list row.

Table Dimensioning Parameters:
Below the Info Bar is a group of entry boxes for defining the size and position of the drill drawing table. Only values in mils are supported. Decimal values are rounded, text entries revert to the default values.
Text Height: values >0 and <=1000mils
Text Width: values >0 and <=50mils
Line Width: values >0 and <=50mils
Default values are based on the current design drill drawing text height and line width.
X Pos., Y Pos.: values >-56000 and <=56000 -depending on design origin.
The X,Y values can be roughly found and entered by moving the cursor into the PPCB design window and noting the coordinate readings in the lower right of the status bar. These values don't need to be exact since the table can be easily re-positioned after it's generated -see also Caveats 1. below.

Layer Selection Scroll Box:
The D3T drawing can be placed on any layer in the current design by using the scroll arrows and selecting a layer. Default layer is Drill Drawing (layer 24).

Command Buttons:
Help: calls up a brief Help window
Cancel: quits the program without creating a DD table
OK: exits the dialog, generates the table code and loads it into the design

Update CAM Symbol Table:
Checked ON by default, this option will direct the program to generate a drill drawing table without updating the Drill Symbol Table located in the CAM Drill Drawing setup (CAM/Drill Drawing Plot/Edit/Options/Drill Symbols). A separate ASCII file with a suffix of _CAM is created in the design directory for manual entry.
****NOTE: if you check this option OFF, the drill drawing may be out of sync with the table. It's only recommended use is for generating multiple tables -see below.*

General Operation Notes:

NC Drill Report File:
The D3T program uses information in the NC Drill report i.e. drl01.rep to create the data for the table. The NC Drill report contains only the used drills for the design and therefore will provide a matched drill drawing table. In order for the program to create a valid table, the NC Drill report must be for the current design and up-to-date. If errors are found in the table it is likely due to an old NC Drill report file.

In addition, the program will automatically locate the correct NC report file by locating the CAM subdirectory referenced in the CAM documents section. If a table is to be generated for a new design, a CAM subdirectory should be setup and the CAM document saved by selecting the Save button in the CAM Documents dialog (see Caveat 2 for more info).

In the process of locating the correct NC Drill report, the program will use the first NC doc it finds in the CAM documents list. If the design contains multiple NC Drill CAM documents such as for blind and buried vias, it is necessary that the correct NC document be above the other NC docs in the list.

Example:
```
top01
bot02
inner03
drl01      <-- 1st NC Drill doc found
drl0506    <--  other drill docs
drl0809
```

Use the Up/Down buttons in the CAM Documents window (in ver4) to move the correct NC Drill above the others -select the Save button to update the design. If using ver3.x, you should Export the CAM docs, read into a text editor then re-arrange each document section as required and import back into CAM.

Table Editing:
The table, once in the design can be edited. Text can be modified, moved, copied or added. Tolerance entries can be added, updated. If there are last minute design changes e.g. 5 vias added, no need to re-gen a new table, just update the qty value. The line items can also be moved. Some operations like changing width will require exploding the drawing. If you add text and want to combine it with the drawing, explode the drawing first then select all and combine.

ASCII File:
D3T generates an ASCII file to load the drill table into the design. Some designers are uneasy about importing ASCII files into a design. Despite the fact that several routine operations use ASCII I/O such as export/import CAM docs, library export/import, netlist input -even an ECO file is a command structured ASCII file. If you still don't like the idea of an ASCII file being automatically loaded into your design you can still use the program -just don't save the design. When the table loads, shift-select it, RMB (right mouse button), Save to Library. This will save it to the 2d Line lib. You can then reload your original design and retrieve the table from the lib (Drafting toolbar, From Library icon).

Filenames:
In loading the new DD table into the design, the design is given a new name by appending _D3T to the design name. This is mainly done to avoid possibly overwriting a user's ASCII design file. If you wish to save your design under your original file name without the extension, select File/Save As -the Save As function retains the original design filename.

Slotted Pads:
PPCB ver4 added the ability to create slotted pads. The D3T program scans the design for slots and adds them to the bottom of the table. No tool numbers are

assigned since they are not included in the NC Drill report. Slots are generally milled; if you wish to include mill tools, you can edit the table to add the text.
Note: in addition to the mill information, a slot is created by a drill at each end of the slot. These drills are added in the table for the specific drill size and plating -the qty field will therefore be: qty = 2b + a ;where b=# of slots and a=# of std drills. Also note that slot length is the entire length -not from center of drills.

Since the D3T table can be edited it is also possible to include curved slots. This could be done by adding the proper pad sizes/types at each end, adding 2d arcs to define the mill path (and a copper arc if plating required) then adding a definition entry to the table -e.g. 125 x 300R 2 A NP (300R defines the arc radius).

Creating Multiple Tables:
To prevent numerous tables from accidentally appearing in the design, the program normally only permits one table to be loaded. PPCB ver4 can check for this automatically. Multiple tables can be created by shift-selecting the table and copying it to the clipboard (Ctrl-C) then deleting the selection -this renames the drawing and allows you to paste it back (Ctrl-V). To create another table for a blind drill layer set or separate plated/non-plated tables on the same drill drawing:

1. Use Ctrl-C/delete/Ctrl-V to rename the last created table.
2. Open the CAM Documents window (File/CAM).
3. Move the required NC Drill doc above the other drill docs.
4. Save CAM.
5. Re-run that NC Drill file (if not already done).
6. Re-run the D3T program -with the Update CAM Symbol Table option unchecked (OFF).
7. Repeat steps 1-6 for each additional table required.

Caveats

1. If the X,Y position values are set such that a part of the table appears outside of the max database area, the table will be unmovable. It's unknown if this is a bug or not. Care should be taken in specifying the X,Y coordinates. No PPCB crashes have been experienced during testing when this condition occurred. The drawing should be deleted by pressing shift and selecting the drawing then delete.

2. If you attempt to generate a table for an archived design which points to a CAM subdirectory that has moved or doesn't exist, an error msg will result. You are given the opportunity to create the subdir in the CAM directory (remember to also select Save CAM) and retry or to cancel out.

Legal Stuff (standard c.y.a. info)

The D3T program has been tested and operates according to the above notes and no other warranties on it's operation are provided. The end user assumes all liabilities from it's use.

Bug Fixes / Updates

Please report any bugs to: support@mindlinktech.com
You are also welcome to provide comments and enhancement suggestions.
D3T updates will be posted to: www.mindlinktech.com