gEDA Utilities

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1 pcb-dim

The script `pcb-dim` outputs the positions of components (elements) in a printed circuit board (PCB) layout. The list of components is specified in a configuration file.

The component positions are calculated using the lines drawn in the outline layer. The datum is the lower-left corner of the boundingbox that contains all of the line endpoints. An offset to the datum may be specified in the configuration file. The default offset is $(0, 0)$.

N.B. This script may not work for all layouts. I wrote sufficient code to work for my PCB layouts not for all possible PCB layouts.

Conventions

⟨*parameter*⟩	Replace with the value of *parameter*
`verbatim text`	Verbatim text when associated with a command or contents of a file.

1.1 Running the Program

`pcb-dim` (⟨*PCB filename*⟩)⋆

If no PCB filenames are specified on the command line then all of the PCB files in the current directory will be parsed.

1.2 Creating Configuration Files

Each file can contain comments, empty lines, lines that define component attributes and lines that define a datum offset. Comments start with a `#` and continue to the end of the current line. Comments and empty lines are ignored by the parser. The configuration filename is the base of the PCB filename with an `.dimcfg` extension.

Lines that create a datum offset are:

`xoffset |`⟨*value in mils*⟩

`yoffset |`⟨*value in mils*⟩

Lines that define component positions to output:

`element |description |`⟨*footprint description string*⟩ (`|`⟨*comment*⟩)?

`element |layout_name |`⟨*reference designator*⟩ (`|`⟨*comment*⟩)?

1.3 Example

The peripheral board in Figure 1 has a hex standoff in each corner and an input connector. Since this peripheral board is placed on top of a microcontroller board (of similar dimensions) the position of the standoffs and the input connector are critical.

Line 1 in the configuration file forces `pcb-dim` to output the position of each of the hex standoffs. The description (footprint name) of the standoffs is `HEXWASHER_2SS-156HD-149WD`.

Line 2 in the configuration file forces `pcb-dim` to output the position of the element with a refdes of `J3` with a comment of `Input Conector`.

Lines 3 and 4 define the offset that will be subtracted from all positions that are output.

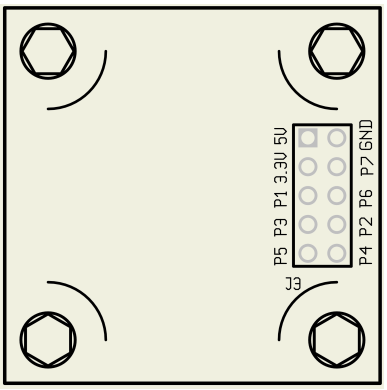

Figure 1: Example PCB

1.3.1 Configuration File

Listing 1: Example Configuration File

```
1 element | description  | HEXWASHER_2SS-156HD-149WD
2 element | layout_name  | J3 | Input Connector
3 xoffset | 150
4 yoffset | 150
```

1.3.2 Output

Listing 2: Sample Output

```
1
2 [pcb-dim-example.pcb]
3
4 # PCB Size = 1300.00 x 1300.00
5
6 # field       |                      value |                    comment |        x |
          y | units
7
8 description   | HEXWASHER_2SS-156HD-149WD |                            |     0.00 |
    1000.00 | mils
9 description   | HEXWASHER_2SS-156HD-149WD |                            |     0.00 |
    0.00 | mils
10 description  | HEXWASHER_2SS-156HD-149WD |                            | 1000.00 |
    1000.00 | mils
11 description  | HEXWASHER_2SS-156HD-149WD |                            | 1000.00 |
    0.00 | mils
12 layout_name  |                        J3 |           Input Connector |  950.00 |
    500.00 | mils
```

2 refdes-update

The script `refdes-update` is designed to change the reference resignator (refdes) attributes of schematic symbols in gschem schematics. The program is called with the command-line —

`refdes-update` ⟨*option*⟩⋆ ⟨*schematic filename*⟩⋆

The command-line options and default values are listed in Table 1. If `refdes-update` is called without schematic filename arguments all of the schematic filenames in the current directory will be parsed.

N.B. This script may not work for all gschem schematics. I wrote sufficient code to work with my schematics not for all possible schematics.

Conventions

⟨*parameter*⟩	Replace with the value of *parameter*
`verbatim text`	
refdes	Reference designator. Character string used to identify a schematic component. Each refdes consists of a prefix, an ordinal and an optional suffix.
prefix	Alphabetic string at the beginning of the refdes.
ordinal	Cardinal number that follows the prefix in a refdes. An undefined ordinal is represented by the `?` character.
suffix	Character string that follows the ordinal in a refdes.

2.1 Running the Program

`refdes-update` ⟨*option*⟩⋆ ⟨*schematic filename*⟩⋆

Schematics may be updated as individual pages or as a collection of pages. For a collection of pages there is a `pageoffset` added to each refdes ordinal. The options are listed in Table 1.

Notes

- Prior to changing the schematic file a backup file will be created. The name of the file will be ⟨*schematic filename*⟩`.bak`⟨*n*⟩.
- The alphabetic suffix on a refdes is ignored when determining the new refdes ordinal. It is also ignored when creating the refdes list.

2.2 Command-line Options

Option	Default	Description
`--clear`	`0`	Resets all refdes ordinals to the undefined value.
`--list`	`1`	Outputs a list, to **STDOUT**, of refdes's that were found in each schematic. Suffixes are ignored.
`--verbose`	`1`	Sundry annoying messages.
`--dryrun`	`0`	Outputs a list of actions to be taken without performing them.
`--reuse`	`0`	Reuses refdes ordinals that were skipped in each schematic.
`--update`	`0`	Only change refdes's were the ordinal is undefined.
`--renum`	`0`	Change all refdes's.
`--nopageoffset`	`0`	Do not add an offset to subsequent schematic pages. The default sets a pageoffset.
`--pageoffset` ⟨*value*⟩	`100`	The offset value added to the refdes ordinal is $(pagenumber - 1) \cdot pageoffset$. The default value is set to 100. Each schematic specified on the command-line is considered a page.

Table 1: refdes-update command-line options

References

Eaton, H., & Nau, T. (2002). Pcb [Computer software and manual]. (Retrieved February 7, 2007 from http://pcb.sourceforge.net/pcb-cvs/pcb.html)

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