

FpcPlace

A Component Placement File Generator for FreePCB

User Guide - Ver. 1.41

Project: minilausb35

30 Footprints found.
149 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

- ⊗ Top SMD Centroids
- ⊗ Top Thru-Hole Centroids
- ⊗ Top Mixed Tech Centroids
- ⊗ Top Null Centroids
- Top Glue

RefDes	Footprint	Side	Loc X	Loc Y	Glue X	Glue Y	Glu Dia	Technology	Pins
B1	BRECT	Top	1.8903	0.3603	1.8903	0.3603	0.0375	Thru-Hole	4
C1	C0805			4900	5.0274	2.4900	0.0375	SMD	2
C10	CHIP_C			9040	2.5760	2.9040	0.0375	SMD	2
C101	Radial1			3300	2.3191	0.3300	0.0375	Thru-Hole	2
C102	C0805			2000	2.7174	0.2000	0.0375	SMD	2
C103	Radial2			6800	2.2994	0.6800	0.0375	Thru-Hole	2
C104	C0805			0100	3.2826	2.0100	0.0375	SMD	2
C105	C0805			6200	3.6826	1.6200	0.0375	SMD	2
C106	C0805			0800	3.7426	2.0800	0.0375	SMD	2
C107	C0805			6400	3.2826	1.6400	0.0375	SMD	2
C108	C0805			7000	3.1674	0.7000	0.0375	SMD	2
C109	C0805			4800	2.9474	3.4800	0.0375	SMD	2
C110	C0805			9626	2.1000	2.9626	0.0375	SMD	2
C111	C0805			3500	2.7626	2.3500	0.0375	SMD	2
C112	C0805			8874	2.9626	2.8874	0.0375	SMD	2
C113	C0805							SMD	2
C2	C0805							SMD	2
C201	C0805	Bottom	0.9926					SMD	2
C202	C0805	Bottom	0.9266					SMD	2
C203	C0805	Top	0.1900					SMD	2
C204	C0603	Bottom	0.6730					SMD	2
C205	C0805	Bottom	0.8226					SMD	2
C206	C0603	Bottom	1.1255					SMD	2
C207	C0603	Bottom	0.8675					SMD	2
C208	C0805	Top	1.5000					SMD	2
C209	C0805	Top	0.3900					SMD	2
C210	MyTANT_A	Top	1.4435					SMD	2
C3	C0805	Top	5.0274					SMD	2
C4	C0805	Top	4.4374					SMD	2
C5	C0805	Top	4.4674					SMD	2
C6	C0805	Top	4.5074					SMD	2
C7	C0805	Top	3.3400	3.4794	3.3400	3.4794	0.0375	SMD	2
C8	C0805	Top	3.8874	3.1000	3.8874	3.1000	0.0375	SMD	2
C9	CHIP_C	Bottom	3.5040	1.8500	3.5040	1.8500	0.0375	SMD	2

This document is formatted for two-sided printing.
New or changed features, in this release, are highlighted in yellow.

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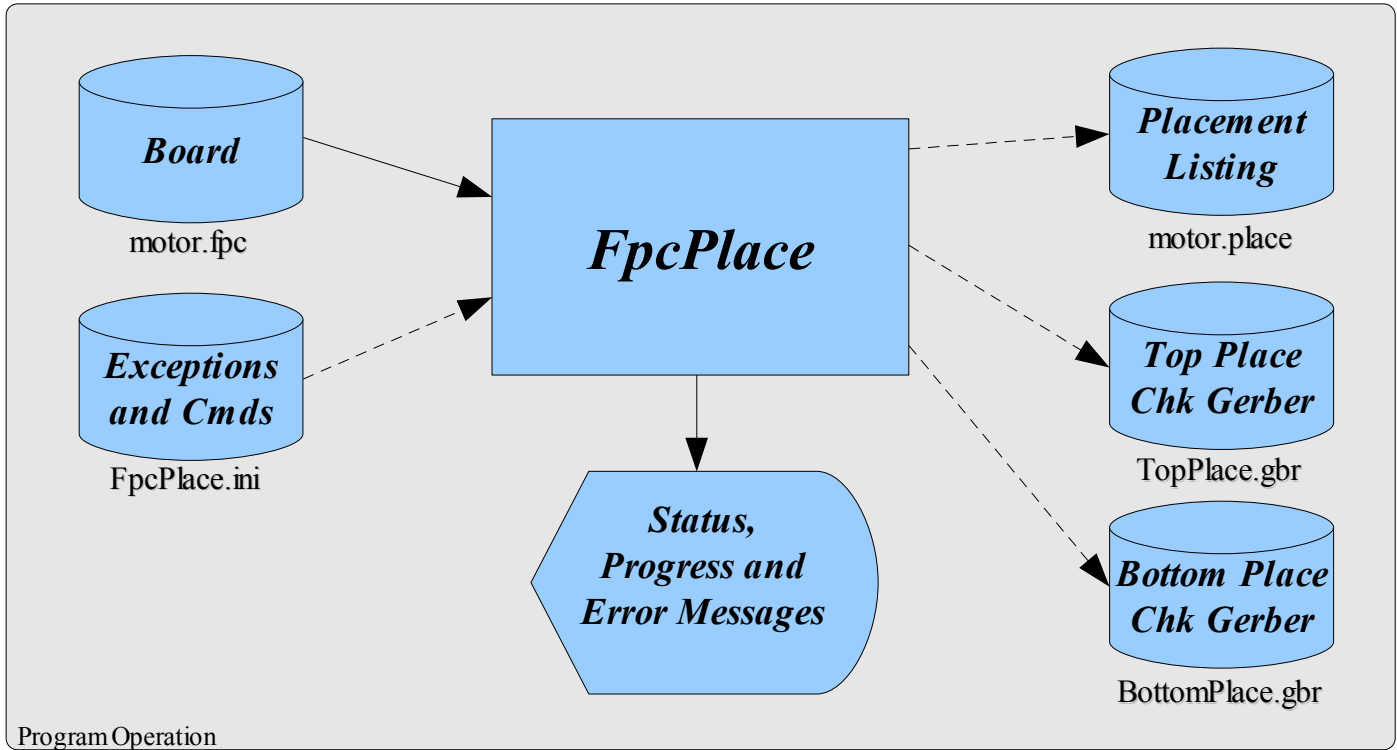
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Introduction

FpcPlace is a Win2K / WinXP console application that generates a component placement listing from the information contained in a **FreePCB** board file. An optional **.ini** file can be used to handle unusual components, override many default setting, add component values and select from a variety of fixed or user defined output listing formats. RS-274X files can be generated from the placement data to verify data extraction.



FpcPlace can function as a console filter or use explicitly specified files for data input, configuration and output. As a console filter, **FpcPlace** uses the standard console devices *stdin* and *stdout* for data I/O and can use the normal file redirection functions **<** and **>** to load the desired board file and control where the output listing goes. In both cases, the console log, sent to *stderr*, can be redirected to a file by using the **2> stderr** redirector.

Additional control can be achieved by using an exceptions list file to handle asymmetric or virtual parts, change default values and control or define the output format.

Installation and Setup

FpfPlace is distributed as a set of files in a zip archive; no install utility is used. To install *FpcPlace*, extract the files **FpcPlace.exe** and **Font.XML** to any handy directory such as C:\Program Files\FpcPlace\ or C:\Program Files\FreePCB\bin\.

Like any executable, if the path to **FpcPlace.exe** is not already included in the **PATH** variable, it should be added.

Additionally, this version of *FpcPlace* uses the file **Font.XML** for Gerber text creation. The path variable **FPCfabFont** should be created and set to point to it. As an alternative to using an environment variable, the full path to the font file can be specified in an ini file.

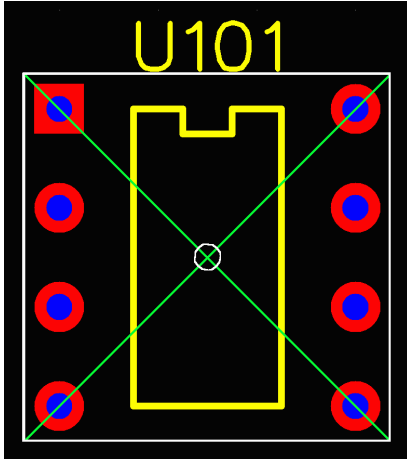
If *FPCfab* is already installed in your system, you can skip the font file installation.

For those unfamiliar with setting environment variables, assume for example that **FpcPlace.exe** is installed in the C:\Program Files\FreePCB\bin directory:

- ◆ Open the Control Panel
- ◆ Open the System tool
- ◆ Click the Advanced tab and open the Environment Variables
- ◆ Scroll the variable list down to and highlight the **path=** entry and click EDIT
- ◆ Click in the value field to clear the highlight
- ◆ Scroll to the end of the field and add **;C:\Program Files\FreePCB\bin** to the existing value
- ◆ Click OK to exit the edit window.
- ◆ Click NEW to create a new variable
- ◆ Set the **name** field to FPCfabFont and **value** field to C:\Program Files\FreePCB\bin.
- ◆ Click OK to exit the edit window.
- ◆ Click OK to save and exit the Environment Variables window

Parts and Exceptions

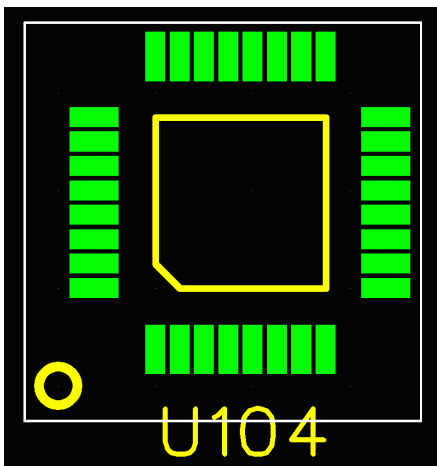
FpcPlace classifies parts, based on pin count and type, as SMD, Thru-Hole (PTH), Mixed Technology or Null. If a part is loaded with only smd pins, it is classed SMD. In like fashion, if all pins have holes, it is considered a Thru-Hole part. If the part has a mix of pins with and without holes, it falls into the Mixed Technology class. Parts without pins, pins without any copper pads or only round pads equal to the hole diameter are classed Null.



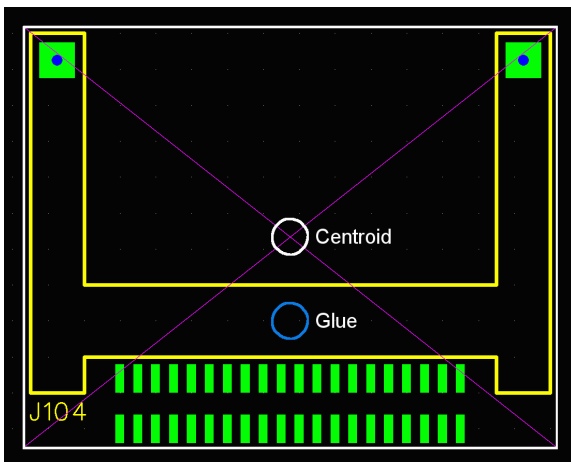
FreePCB defines the bounding box, called *sel_rect* in the board file, to be outside of all pads and lines by a fixed 10 mils without regard to text or refdes items.

By default **FpcPlace** uses the center of the component's bounding box as the centroid. The centroid, adjusted for rotation and board side, is used for both component and glue placement. For most symmetric parts, as shown at left, this method produces the correct result.

Note: beginning with version 1.341, **FreePCB** footprints include an explicit, user modifiable, centroid. If found, **FpcPlace** will use the centroid value in place of the default bounding box center.



Unfortunately not all parts are symmetric. In this example, U104's footprint was modified to add a component orientation dot that extends beyond the pin area. This has skewed the bounding box down and to the left by 100 mils and, if uncorrected, would result in a placement error.



J104 is an example of an inherently irregular, asymmetric part. The part can be purchased with a detachable *pick-n-place* pad located at the centroid but glue, if used to anchor the part for reflow, would need to be under the body.

FpcPlace can compensate for problem parts, like those mentioned above, by including component exceptions in the **FpcPlace.ini** file. When **FpcPlace** starts, it looks for the file **FpcPlace.ini** in the current working directory. If found, it is loaded prior to loading the board file.

Operation

FpcPlace is a 32-bit console application; to use it, open a new command shell after the environment variables are edited and make the directory where the FreePCB project is located the working directory. If the shell was opened prior to the environment edit, its copy of the environment will not be updated.

Explicit source and destination file names can optionally be defined either through command line parameters or embedded commands in the ini file. In both cases, if a single name is specified, it is used as the source name and the destination name is formed from it by removing any extension and appending ".place". If the source name does not include an extension, ".fpc" is appended. If the destination name is specified and does not include an extension, ".place" is appended. If no names are defined in either the command line or ini file, FpcPlace will continue to use standard I/O and redirection can be used to control the data source and destination. If names are present in both the command line and the ini file, the names specified in the command line are used. In any case, the console log, always sent to *stderr*, can be redirected to a file by using **2>** or append with **2>>**.

The **-I** command line switch can be used to specify a new ini file name or to bypass ini file processing altogether. If used with a file name, i.e. **-Imotor_place.cfg**, the named file will be used for configuration in lieu of the default *FpcPlace.ini*. If used alone, without any name, i.e. **-I**, ini file processing is skipped. Note that, if a name is specified with the **-I** switch and it does not exist, **FpcPlace** will exit with an error message. This differs from the default behavior where, if *FpcPlace.ini* is not found, processing continues. No spaces are allowed between the switch **I** character and the file name and, if the file name includes any embedded spaces, the entire switch must be enclosed within quotes: **"-iA name with spaces.xyz"**. If the **-I** switch is used, it must appear before any I/O file names or redirection parameters. The **-I** switch is not case sensitive.

FpcPlace does not use any other command line parameters to control its behavior; any other optional controls are applied by including a **FpcPlace.ini** file in the working directory or by specifying a configuration file with the **-I** switch.

The following examples use an edited version of the motor.fpc board found in the tutorial section of FreePCB. Some parts were moved to the bottom side for illustration.

Run FpcPlace and send the results, in the default “show everything” format, to the console.

C:\PCBS\Motor> FpcPlace < motor.fpc

FpcPlace - A Component Placement File Generator for FreePCB
Ver 1.10R (c)2006 Bruce Parham

Project: motor

12 Footprints found.
25 Parts found.

Project: motor

12 Footprints found.
25 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored. Rotation is CW.

RefDes	Footprint	Side	Loc X	Loc Y	Glue X	Glue Y	Glu Dia	Technology	Pins
C1	CHIP_D	Top	0.5400	0.7620	0.5400	0.7620	0.0250	SMD	2
C2	C1206	Bottom	0.5400	L 1.1649	0.5400	1.1649	0.0250	SMD	2
C3	CHIP_B	Top	2.5000	1.4215	2.5000	1.4215	0.0250	SMD	2
C4	CHIP_B	Top	2.5000	0.8215	2.5000	0.8215	0.0250	SMD	2
C5	C1206	Bottom	0.9449	1.2800	0.9449	1.2800	0.0250	SMD	2
C6	C0805	Bottom	1.7600	0.7826	1.7600	0.7826	0.0250	SMD	2
C7	C0805	Top	2.0574	1.5800	2.0574	1.5800	0.0250	SMD	2
D1	CHIP_B	Top	0.3785	1.5000	0.3785	1.5000	0.0250	SMD	2
H1	HOLE_125_SQR_250	Top	0.1500	0.1500	0.1500	0.1500	0.0250	Thru-Hole	1 *
H2	HOLE_125_SQR_250	Top	0.1500	1.8500	0.1500	1.8500	0.0250	Thru-Hole	1 *
H3	HOLE_125_SQR_250	Top	2.8500	L 1.8500	2.8500	1.8500	0.0250	Thru-Hole	1 *
H4	HOLE_125_SQR_250	Top	2.8500	0.1500	2.8500	0.1500	0.0250	Thru-Hole	1 *
J104	XYZ_Socket	Top	3.6750	4.6325	3.6750	4.6325	0.0250	Mixed	42
JP1	5X2HDR-100	Top	2.1000	1.8500	2.1000	1.8500	0.0250	Thru-Hole	10
JP2	5X2HDR-100	Top	2.8500	1.3000	2.8500	1.3000	0.0250	Thru-Hole	10
JP3	5X2HDR-100	Top	2.8500	0.7000	2.8500	0.7000	0.0250	Thru-Hole	10
JP4	5X2HDR-100	Top	0.1500	L 0.7000	0.1500	0.7000	0.0250	Thru-Hole	10
JP5	3X2HDR-100	Top	1.5000	1.8500	1.5000	1.8500	0.0250	Thru-Hole	6
JP6	1X2HDR-100	Top	0.1000	1.4500	0.1000	1.4500	0.0250	Thru-Hole	2
R1	C1206	Top	2.5000	1.1449	2.5000	1.1449	0.0250	SMD	2
R2	C1206	Top	2.5000	0.5449	2.5000	0.5449	0.0250	SMD	2
R3	C1206	Top	0.6551	1.5000	0.6551	1.5000	0.0250	SMD	2
U1	28DIP300_A5	Top	1.4500	L 0.9500	1.4500	0.9500	0.0250	Thru-Hole	28
U2	14DIP300	Top	2.0500	1.1000	2.0500	1.1000	0.0250	Thru-Hole	14
U3	TO-220	Top	0.9900	1.6000	0.9900	1.6000	0.0250	Thru-Hole	3
U101	Dip8	Top	-0.1500	5.0500	-0.1500	5.0500	0.0250	Thru-Hole	8
U104	qfp-32	Top	2.2687	4.8487	2.2687	4.8487	0.0250	SMD	32
Y1	8DIP300	Top	0.9500	0.9500	0.9500	0.9500	0.0250	Thru-Hole	8

Done!

And the same example with the output sent to motor.place.

C:\PCBS\Motor> FpcPlace motor.fpc

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Ver 1.10R (c)2006 Bruce Parham

Project: motor

12 Footprints found.
25 Parts found.

Done!

FpcPlace.ini Details

The *ini* file can contain a combination of exception records, embedded command, comments and blank lines.

Exceptions specify a footprint by name and apply to all instances of that footprint within the board file. A footprint exception can be used to suppress the listing of virtual parts, like mounting holes and test points, that do not correspond to any real parts. Exceptions can also specify the centroid and glue spot locations as well as the glue spot size. Exception records are somewhat free form in that leading white space can be freely used and parameters can be separated by one or more spaces and a record can include a trailing comment. A record may contain two, four, six or seven parameters. Any record with one, three or five parameter will be rejected. Blank lines and anything after a semicolon ";", including the semicolon, are ignored as comments. Leading white space (spaces or tabs) is ignored. All linear dimensions are in INCH units. All coordinate dimensions are relative to the unrotated footprint origin as viewed in the *FreePCB* Footprint Editor or Footprint Wizard. Coordinates are not based on the location of Pin-1. Single line comments and blank lines can be freely used for documentation and readability. Exception records for a given footprint may be entered more than once with the last entry overriding earlier entries. **Note:** beginning with version 1.344, *FreePCB* footprints may include a list of one or more user defined glue spots. *FpcPlace* can preserve or delete this list. Any glue spots defined by exception records will be added to the list. Also, multiple exception records may be entered to add additional spots to the list.

Exception Record format:

Footprint_name Ignore [[[{LocX LocY}] {GlueX GlueY}] GlueDia]

Footprint_name	The name of the footprint that the listed actions will be applied to. If the name contains spaces, it must be enclosed within quotes. <u>This FIELD IS CASE sensitive.</u>
Ignore	Boolean flag. If TRUE, any part using this footprint will be omitted from the output listing. Set for mechanical parts, mounting holes, SMT test points, etc.
LocX LocY	New placement centroid location relative to the unrotated component origin. Set both values to less than -9.0 to ignore the field and use the default values.
GlueX GlueY	New glue spot location relative to the unrotated component origin. Set both values to less than -9.0 to ignore the field and use the default values.
GlueDia	Glue spot diameter. Use this field to override the default 0.025" spot size. Enter 0.0 to delete (reset) this footprint's glue spot list.

Ex:

MTH-8 1	Ignore mounting holes using the "MTH-8" footprint
SOIC-8 0 -10 -10 -10 -10 0.075	Change the glue spot size on "SOIC-8" parts to 75 mils. Placement and glue spot locations will use default values.
CFT-125 0 -10 -10 .625 .135	Change the glue spot location to 0.625,0.135 on "CFT-125" parts. Component placement and glue spot size will use default values.
"Fat Parts" 0 1.2345 1.1234	Relocate the placement center of "Fat Parts". Glue size and location use default values.

Embedded commands

Embedded commands can be used in the ini file to change system default setting like the glue spot size and what type has glue applied. The format for embedded commands is similar to exception records in that trailing white space and comments can be freely used but commands must start with a hyphen '-' in column 1 (NO LEADING WHITE SPACE) followed immediately in column 2 with the command character. The command character is not case sensitive, upper or lower case produce the same results. Any accompanying parameter(s) may follow immediately or be separated one or more white space characters.

String parameters are delimited by white space. To include spaces within the string, enclose the whole string within quotes (""). The *Header* and *Ival* parameter strings are both limited to 16 characters and if longer, will be truncated. The *Ref* string can contain one or more *RefDes* substrings. *Ref* itself is limited 256 characters while any *RefDes* substrings are limited to 32 characters. The EOF *Message* string is limited to 127 characters.

Commands can be entered more than once with the last entry overriding earlier entries.

The following commands are currently defined:

-A *name*

Include file *name* for additional commands and exceptions. Included files use the same format as the ini file and can include additional files up to eight nesting levels.

-C *n* [*x.xx y.yy*]

Control Gerber check plot file generation. Boolean flag *n*, when TRUE, enables file generation. The optional *x.xx y.yy* coordinate pair, if present, override the default (0.5, -0.5) location of the icon table. (The point defined is the upper left corner). Set *n* to 1 to enable multiple data layers or 2 to use a single data layer for all objects. A file is created for each side that contains any unsuppressed parts.

-D *x.xxxx*

Glue spot Diameter. Change the default 0.025 inch glue spot diameter to *x.xxxx* inch or mm.

-E [*Message*]

End Of File. This command is optional and, if found, will stop exception file processing. If present, the Message string is displayed on the console.

-F *n* [*Header*]

Output listing Format. Change the output format to *n*. If present, the *Header* string will enable the optional **Info** column, in formats **1** and **2**, and become the column heading. For *user defined formats* **3** and **4**, the output column list is cleared. See the **-H** command and **Output Formats** section for more details.

The currently defined formats:

- 1 = Output listing off – handy for just generating Gerbers or debugging ini files
- 0 = All-in-one tabular listing
- 1 = Tabular listing by side and technology
- 2 = CSV listing
- 3 = User defined all-in-one tabular listing
- 4 = User defined by side and technology

-G *n1 n2 n3 n4*

Glue spot control by technology. Boolean values globally control glue spot size. A zero value forces a glue spot size of zero for the selected technology, a non-zero value allows the default or specified size to be used. N1 controls SMD parts, N2 thru-hole parts, N3 mixed technology parts and N4 Null parts. The N1 SMD parameter must be entered. If fewer than four parameters are entered, the last one entered is applied to the remaining empty fields.

-H s [w [Header]]

For listing formats **3** and **4**, add a user defined data column to the output listing. These formats allow the user to select which data fields and in what order they appear in the output listing. The **s** parameter is the data field select code (see table below). The **w** parameter, if present, can be used to set the column width in characters. The **Header** parameter, if present, will replace the default column heading text. The actual column width used depends on the Minimum Width, the width defined by the **w** parameter and column heading text: the larger of the three is used. The column minimum widths are defined to insure full precision for numeric data but string data will be truncated to the width used. Note too that the glue spot data is an open ended list and as such, if used, should be the last column defined.

Select Code	Data Field	Minimum Width	Default Heading	Comment
0	Comp Ref Des	8	"RefDes"	Normally should be first column
1	Comp Value String	8	"Value"	Component Value field string
2	Comp Info String	8	"Info"	-I command <i>Ival</i> string
3	Value and Info Strings	17	"Value and Info"	Both with one space between
4	Footprint Name	12	"Footprint"	
5	Comp Board Side	6	"Side"	"Top" or "Bottom"
6	Comp Rotation Angle	5	"Angle"	As defined by -R command
7	Comp X Location	8	"Loc X"	Inch = 4, mm = 3 digit precision
8	Comp Y Location	8	"Loc Y"	Inch = 4, mm = 3 digit precision
9	Comp X,Y Loc	17	"Loc X,Y"	Inch = 4, mm = 3 digit precision
10	Comp Technology	5	"Tech"	"SMD", "PTH", "Mixed" or "Null"
11	Pin Count	5	"Pins"	"*" added for 1-pin or Null parts
12	Glue X,Y Loc	17	"Adhesive X,Y"	Inch and mm both 3 digit precision
13	Glue X,Y Loc and Size	26	"Adhesive X,Y, Dia"	Inch and mm both 3 digit precision
14	Footprint Centroid Angle	8	"Cent Ang"	
15	Footprint Author String	16	"FP Author"	
16	Footprint Source String	16	"FP Source"	
17	Footprint Description String	16	"FP Desc"	
18	Glue Spot Count	14	"Adhesive Count"	

In the following example, two possible output formats are defined. The first listing defines component placement and the second, adhesive application. To use the second, comment out the first -E command.

```
.
.
-U Inch ; Set units
-I C1 "Digikey XXXCT-ND" ; Add part number
-F 4 ; Select format 5 and reset the column list
-H 0 ; First column is refdes
-H 3 32 "Component Description" ; Combined Value and Info with new heading
-H 10 ; Technology
-H 9 1 "X,Y Location" ; Headings with spaces must be quoted
-H 6 1 Rotation ; New heading will define width
-H 5 ; Side

-E "Generating Component Placement" ; comment out to generate glue list

-F 4 ; Reset the output format and build the glue list
-H 0 ; refdes first
-H 5 ; side
-H 18 ; glue spot count next
-H 13 ; glue location and size: [x.xxx, y.yyy, d.ddd] [...]

-U Metric ; switch to mm for output

-E "Generating Glue List" ;
```

Running FpcPlace produces:

Project: motor_mod

20 Footprints found.

33 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CW

Bottom = CW

RefDes	Component Description	Tech	X,Y Location		Rotation	Side
C1	10 uF, 16V Tant Digikey XXXCT-ND	SMD	0.5400,	0.7620	90	Top
C3		SMD	2.5000,	1.4215	90	Top
C4		SMD	2.5000,	0.8215	90	Top
C7		SMD	2.0574,	1.5800	0	Top
D1		SMD	0.3785,	1.5000	0	Top
RefDes	Component Description	Tech	X,Y Location		Rotation	Side
H1	Mounting Hole	PTH	0.1500,	0.1500	0	Top
H2		PTH	0.1500,	1.8500	0	Top
H3		PTH	2.8500,	1.8500	0	Top
H4		PTH	2.8500,	0.1500	0	Top
JP1		PTH	2.1000,	1.8500	0	Top
RefDes	Component Description	Tech	X,Y Location		Rotation	Side
J104	Edge-40-01-L	Mixed	2.1750,	2.9175	0	Top
RefDes	Component Description	Tech	X,Y Location		Rotation	Side
C1R1		Null	1.0000,	0.5000	0	Top
C1R2		Null	1.6900,	0.0300	0	Top
Mech1		Null	0.7000,	3.1000	0	Top
RefDes	Component Description	Tech	X,Y Location		Rotation	Side
C2		SMD	0.5400,	1.1649	270	Bottom
C5		SMD	0.9449,	1.2800	0	Bottom
C6		SMD	1.7600,	0.7826	270	Bottom

Commenting out the first -E command produces the glue list:

Project: motor_mod

20 Footprints found.

33 Parts found.

Units: MM

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CW

Bottom = CW

RefDes	Side	Adhesive Count	Adhesive X,Y,Dia
C1	Top	1	[13.716, 19.355, 0.635]
C3	Top	1	[63.500, 36.106, 0.635]
C4	Top	1	[63.500, 20.866, 0.635]
C7	Top	1	[52.258, 40.132, 0.635]
D1	Top	1	[9.614, 38.100, 0.635]

RefDes	Side	Adhesive Count	Adhesive X,Y,Dia
H1	Top	1	[3.810, 3.810, 0.635]
H2	Top	1	[3.810, 46.990, 0.635]
H3	Top	1	[72.390, 46.990, 0.635]
H4	Top	1	[72.390, 3.810, 0.635]
JP1	Top	1	[53.340, 46.990, 0.635]

RefDes	Side	Adhesive Count	Adhesive X,Y,Dia
J104	Top	3	[38.100, 68.580, 1.000] [55.372, 68.580, 2.000] ...

RefDes	Side	Adhesive Count	Adhesive X,Y,Dia
CIR1	Top	0	
CIR2	Top	0	
Mech1	Top	0	

RefDes	Side	Adhesive Count	Adhesive X,Y,Dia
C2	Bottom	1	[13.716, 29.588, 0.635]
C5	Bottom	1	[24.000, 32.512, 0.635]
C6	Bottom	1	[44.704, 19.878, 0.635]

-I *Ref Ival [Ig [Gd]]*

Add *Ival* to component *Ref*. If the **Info** column output is enabled, *Ival* will be listed for component *Ref*. *Ref* can consist of a single entry like C101 or multiple entries separated by commas and/or spaces. *Ref* and *Ival* must be quoted if spaces are included. To update *Ref* without changing a previously entered *Ival*, use an empty string formed by two quotes without any space. Use the escape sequence `\` to include a quote within a quoted *Ival* string.

The optional boolean ignore flag *Ig* can be used to suppress or enable *Ref* parts. An *Ig* value of zero will enable *Ref* in Gerber and listing outputs. An *Ig* value of one will suppress *Ref* in all outputs.

The optional *Gd* parameter can place final control of glue application for part *Ref*.

Gd < 0 - Use footprint setting
Gd = 0 - No glue (glue dia = 0.0)
Gd > 0 - Set Glue Diameter to *Gd*

Some valid examples:

R1,R2,R3,R4 4.7K	Comma separated list without spaces.
"R1 R2 R3 R4" "4.7K 1W"	Quoted space separated list.
"R1, R2, R3, R4" "1.00M 1%"	Quoted comma separated list with embedded spaces.
C101 "" 0 0.042	Change C101s glue spot size
C102 "" 1	Omit C102 from all outputs
R301 "1K \"Trim-Pot\""	Info staring with quotes (listed as : 1K "Trim-Pot")

-M *n*

Boolean flag *n* controls how mechanical parts are handled. If *n* is zero, mechanical parts are classed as Null (no pins). If not zero, mechanical parts are treated like any other thru-hole part. (Mechanical parts are found by pin analysis and are defined as parts with drilled pins without any copper or round pads the same diameter as the drill.)

-N *src_name [dest_name]*

Specify the FreePCB source and listing destination file names. If only one name is present, it is used as the source and the destination name is formed by using the source name and changing the extension to ".place". If the source name does not include an extension, the default extension ".fpc" is appended.

If a second name is present, it is used as the destination name. If this name does not include an extension, the default extension ".place" is appended.

Both names may include valid absolute or relative path information and, if either name contains any spaces, it must be enclosed in (") quotes. The -N command can be entered multiple times with the last entry being used. Note that names specified in the command line take priority over any names specified by this command.

-P *fpath*

Font file path. Use *fpath* to override the default font name and path. A complete path including file name must be entered. The new path can be relative or absolute and must be quoted if it contains any embedded spaces. Enter a null string (two quotes with no space) to restore default path behavior.

-R *n* | {*Top*|*Bottom*} *dir* [*offset* [*fca*]]

Displayed rotation control. **FpcPlace**, by default, now displays CCW rotation for components located on both the top and bottom sides of the board. The **-R** command can be used to override the default behavior either globally or uniquely for each side. In its original form, with a single boolean numeric parameter, rotation for both sides can be controlled: if *n* = 0, CW rotation is used, otherwise translate part rotation to CCW. In both cases no offset or footprint centroid angle is added.

In its newer, expanded format, with the first parameter equal to "Top" or "Bottom", the rotation direction with or without a fixed offset and the footprint centroid angle can be used to specify component rotation specific to each side. The *dir* parameter, like *n* above, selects the direction: 0 = CW, else CCW. The optional *offset* parameter is a fixed offset added to the resulting angle and can equal -270, -180, -90, 0, 90, 180 or 270. The optional *fca* parameter, equal to -1, 0 or +1, is multiplied by the centroid angle and the product is also added to the rotation angle.

With the new, expanded format, only the first letter of the first parameter is significant and it can be upper or lower case. For optional parameters, if a value is not entered, the parameter is set to zero. CW or CCW rotation only applies to the component angle translation; any offset or centroid angle are not translated. Any *offset* angle entered is force to an integer multiple of 90° between -270 and +270 and any *fca* coefficient entered is limited to -1, 0 or +1.

Examples:

-R 1	Set global rotation to the default CCW
-R 0	Set global rotation to CW
-R Top 1	Set top side rotation to CCW
-r t 1	Same as above
-R Bottom 0 180	Set bottom side rotation to CW + 180
-R T 1 90 1	Set top to CCW + 90 + Centroid Angle
-R B 0 -180 -1	Set bottom to CW – 180 – Centroid Angle

-T *s.sss*

Scale the targets used in Gerber check plots. Allowable range 0.01 – 1.35.

-U *units*

Units select. The *units* parameter is a single word used to select English or Metric values for data entry and output listing. Only the first character, I or M, is significant and can be upper or lower case. Valid unit values include *inch*, *Inch*, *INCH* or *I* for English units and *Metric*, *MM*, *mm* or *m* for Metric. The units command can be entered any number of times with the selected units remaining in effect until being changed by another entry. The last entry will control the output listing units.

-V *n*

Boolean flag *n* controls verbose debug output.

Embedded command examples

-A options.inc	Include a file with additional commands and/or exception.
-A "Standard Cfg.inc"	Include a file with embedded spaces in the name.
-C 1 3.500 2.750	Enable Gerber check plots with multiple data layers and move the target icon table to 3.5,2.75.
-c 2	Enable Gerber check plots using a single data layer within each file.
-c 0	Gerber plots off (default).
-d 0.052	Change the default glue spot size to 52 mils.
-E "Normal Config Loaded"	End exception processing now, ignore the rest of the file.
-F 0	Use format 0 without Info column display. This is the normal default display.
-F 1	Use format 1 for output. No Info column displayed.
-f 0 Value	Use format 0 and include the Info column. Title the Info column Value .
-f 0 "New Value"	Format 0 with Info column title New Value .
-F 2 "Comp Value"	Use CSV format 2 with Info column title Comp Value .
-G 1 0	Enable glue for SMD, all others off.
-G 0 1 0	Glue off for SMD and mixed, on for thru-hole.
-G 0	Glue off for all.
-g 1	Glue on for all. This is the default value.
-I C101 220pf	Add <u>220pf</u> to the Info column entry for C101.
-I C3 "220pf 200V"	Add <u>220pf 200V</u> to the Info column entry for C3.
-I C1,C2,C3 ".1uF 15V"	Add <u>.1uF 15V</u> to the Info column entry for C1, C2 and C3.
-i "C1 C3 C7" "33pf 1%"	Add <u>33pf 1%</u> to the Info column entry for C1, C3 and C7.
-i R1 "4700 100 Watt 10%"	Add <u>4700 100 Watt 10</u> to the Info column entry for C3. Note that only the first sixteen characters are used with listing formats 0 - 2.
-I R201 Omit	Info for R201 set to Omit in this configuration.
-M 1	Treat mechanical parts as normal Thru-Hole parts. Default value.
-m 0	Treat mechanical parts as Null without regard to the number of pins.
-N motor	Use motor.fpc for input and motor.place for listing output.
-n "c:\abc\Test Bd" list.txt	Use c:\abc\Test Bd.fpc for input and list.txt for output.
-P myfont.xml	Load myfont.xml for Gerber text.
-p "..\new font.xml"	Load "new font.xml" from the parent of the current directory.
-p C:\pcbs\xyz\font.xml	Load the font file using an absolute path.
-p ""	Restore default font loading.
-R 0	Set displayed rotation to CW. Default is CCW.
-R Top 1 0 1	Set displayed top rotation to CCW + Centroid angle.
-R b 0 180	Set displayed bottom rotation to CW + 180.
-T 0.5	Scale Gerber targets by 0.5. Default is 1.000.
-U mm	Change data entry and output list units to metric.
-u inch	Change data entry and output list units to inches (default).
-v 1	Enable debug output (to stderr).
-G 1 ; Glue everything!	A command with a trailing comment.
; A comment line	A comment only line.

An example ini file with two configurations:

```
;      FpcPlace Ini for XYZ co. A12345 board

; Comment out the first EOF command to enable the Option 1 configuration.

-v 1                ; debug display on

-c 1 3.5 2          ; do Gerber check plots using separate data layers
-c 2                ; Gerber plots on a single data layers
-c 0                ; Gerbers off (default)
-t .75              ; scale targets to 75% of default

-f 1 "Comp Value"    ; select format, add value column

-m 1                ; class mech parts as Null

        ; List values for all passives

; All caps
-I C101 "100pF 16V"
-I C102 "220pF 16V"
-I C103 ".1uF 25V"
-I C104,C106 "10uF 6.3V"
-I C105 "22pF 16V"

; All res
-I R101 "100K 1%"
-I R102 "4.7K 1%"
-I R103 "330 5%"
-I R104 "49.9 1%"
-I "R105 R106" "1.12M 1%"

-i J101 "2x6 header"

R1206 0 -10 -10 -10 -10 0.04      ; 1206 parts use 40 mil glue spots
C1206 0 -10 -10 -10 -10 0.04

XYZ_Logo 1                        ; unlist some null parts
MTH-6    1
TP40mil  1

-r 1                               ; rotation CCW
-g 1 0                             ; just glue smd parts
-d 0.032                           ; change default to 32 mils

-u inches                          ; use the default listing units

-e "Standard Configuration Loaded" ; end "Standard Configuration" load

; Option 1 configuration

        ; Item that differ from standard (override previous entries)

-I C101 "470pF 16V"
-I C102 Omit

-I R104 "100 1%"

-U mm                               ; use metric unit in listing

-e "Opt-1 Configuration Loaded"    ; end "Opt-1 Configuration" load
```

Verbose (Debug) display

With the output listing redirected to a file, the only information displayed on the terminal is a sign-on message and, if an ini file is used, some line and item counts. If the board file is corrupted, some error messages may also show up.

Ex.:

```
FpcPlace - A Component Placement File Generator for FreePCB
Ver 1.20R (c)2006 Bruce Parham
```

```
29 lines examined
11 valid embedded commands found
 4 info records loaded
 5 exceptions loaded
```

Project: motor_mod

```
19 Footprints found.
32 Parts found.
```

Done!

With the Verbose display enabled, additional information, currently limited to ini file parsing, is displayed. Each exception and embedded command encountered in the ini file produces a message. This feature can be used to diagnose unexpected operation. In the example below, line 14 contains an undefined command and line 24 redefined the exception settings for *Circ200*.

```
FpcPlace - A Component Placement File Generator for FreePCB
Ver 1.20R (c)2006 Bruce Parham
```

```
Line 3: Verbose output enabled
Line 4: Output Format changed to 1  Info Hdr: Component Value
Line 5: Mechanical parts are Null
Line 7: Adding Info: C1 100pf
      Adding Info: C3 100pf
Line 8: Adding Info: C2 2.2  25V
Line 9: Adding Info: R1 4.7K  1/2W
      Adding Info: R3 4.7K  1/2W
      Adding Info: R5 4.7K  1/2W
Line 10: Replaced Info: R1 4.7K  1206
Line 11: Adding Info: Mech1 Antenna support
Line 13: Rotation set to CCW
Line 14: Bogus Command Ignored: -z bad
Line 16: Added: XYZ_Socket 0 -10 -10 0.475 0.30 0.10
Line 18: Added: HOLE_125_SQR_250 1
Line 20: Added: SMD-TP50 1
Line 22: Added: Circ200 0
Line 24: Replaced: Circ200 1
Line 26: Added: Logol 1
Line 28: Verbose output disabled
```

Line 29 - EOF: End of Demo Ini Processing

```
29 lines examined
11 valid embedded commands found
 4 info records loaded
 5 exceptions loaded
```

Project: motor_mod

```
19 Footprints found.
32 Parts found.
```

Done!

Output Formats

FpcPlace currently supports five distinct output formats. The default “show everything” format 0 displays all relevant information for each part with the parts sorted by RefDes. Format 1 uses the same general layout but groups the parts based on board side and technology. Format 2 is a special CSV (Comma Separated Values) layout requested by an early user. Formats 3 and 4 allow the user to define which values are displayed. Format 3, like format 0, produces a single list while format 4, like format 1, breaks up the listing by board side and technology. The RefDes sorting algorithm has been enhanced by add a numeric sort step to each alpha prefix thus insuring that U101 will appear after U2, not before.

Format 0 example without any INI file used:

Project: motor_mod

19 Footprints found.
32 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CCW

Bottom = CCW

RefDes	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
C1	CHIP_D	Top	0.5400	0.7620	90	0.5400	0.7620	0.0250	SMD	2
C2	C1206	Bottom	0.5400	L 1.1649	270	0.5400	1.1649	0.0250	SMD	2
C3	CHIP_B	Top	2.5000	1.4215	90	2.5000	1.4215	0.0250	SMD	2
C4	CHIP_B	Top	2.5000	0.8215	90	2.5000	0.8215	0.0250	SMD	2
C5	C1206	Bottom	0.9449	1.2800	0	0.9449	1.2800	0.0250	SMD	2
C6	C0805	Bottom	1.7600	0.7826	270	1.7600	0.7826	0.0250	SMD	2
C7	C0805	Top	2.0574	1.5800	0	2.0574	1.5800	0.0250	SMD	2
CIR1	Circ200	Top	1.0000	0.5000	0	1.0000	0.5000	0.0250	Null	0 *
CIR2	Logo1	Top	2.1750	0.1300	0	2.1750	0.1300	0.0250	Null	0 *
D1	CHIP_B	Top	0.3785	1.5000	0	0.3785	1.5000	0.0250	SMD	2
H1	HOLE_125_SQR_250	Top	0.1500	0.1500	0	0.1500	0.1500	0.0250	Thru-Hole	1 *
H2	HOLE_125_SQR_250	Top	0.1500	1.8500	0	0.1500	1.8500	0.0250	Thru-Hole	1 *
H3	HOLE_125_SQR_250	Top	2.8500	L 1.8500	0	2.8500	1.8500	0.0250	Thru-Hole	1 *
H4	HOLE_125_SQR_250	Top	2.8500	0.1500	0	2.8500	0.1500	0.0250	Thru-Hole	1 *
J104	XYZ_Socket	Top	2.1750	L 2.9325	0	2.1750	2.9325	0.0250	Mixed	42
JP1	5X2HDR-100	Top	2.1000	1.8500	0	2.1000	1.8500	0.0250	Thru-Hole	10
JP2	5X2HDR-100	Top	2.8500	1.3000	90	2.8500	1.3000	0.0250	Thru-Hole	10
JP3	5X2HDR-100	Top	2.8500	0.7000	90	2.8500	0.7000	0.0250	Thru-Hole	10
JP4	5X2HDR-100	Top	0.1500	L 0.7000	90	0.1500	0.7000	0.0250	Thru-Hole	10
JP5	3X2HDR-100	Top	1.5000	1.8500	0	1.5000	1.8500	0.0250	Thru-Hole	6
JP6	1X2HDR-100	Top	0.1000	1.4500	180	0.1000	1.4500	0.0250	Thru-Hole	2
Mech1	Mech part	Top	0.7000	3.1000	0	0.7000	3.1000	0.0250	Thru-Hole	5 *
R1	C1206	Top	2.5000	1.1449	90	2.5000	1.1449	0.0250	SMD	2
R2	C1206	Top	2.5000	0.5449	90	2.5000	0.5449	0.0250	SMD	2
R3	C1206	Top	0.6551	1.5000	0	0.6551	1.5000	0.0250	SMD	2
TP101	SMD-TP50	Top	1.0000	0.5000	0	1.0000	0.5000	0.0250	SMD	1 *
U1	28DIP300_A5	Top	1.4500	L 0.9500	90	1.4500	0.9500	0.0250	Thru-Hole	28
U2	14DIP300	Top	2.0500	1.1000	90	2.0500	1.1000	0.0250	Thru-Hole	14
U3	TO-220	Top	0.9900	1.6000	270	0.9900	1.6000	0.0250	Thru-Hole	3
U101	Dip8	Top	0.0000	2.5500	90	0.0000	2.5500	0.0250	Thru-Hole	8
U104	qfp-32	Top	0.7188	2.5688	0	0.7188	2.5688	0.0250	SMD	32
Y1	8DIP300	Top	0.9500	0.9500	90	0.9500	0.9500	0.0250	Thru-Hole	8

By using the following ini file...

```
;      FpcPlace ini file for motor_mod.fpc

-f 0 ; "Component Value"
-m 0 ; mech parts are null

-i C1,C3,C4,C6 100pf
-i "C2 C5 C7" "2.2 25V"
-i R1 "4.7K 1206"
-i Mech1 "Antenna support"

-r 1 ; show rotation as CCW
-z bad

XYZ Socket 0 -10 -10 0.475 0.30 0.10 ; relocate glue spot and make bigger
HOLE_125_SQR_250 1 ; suppress mounting holes
SMD-TP50 1 ; and test points
Circ200 1 ; graphic or mech part
Logo1 1

-e "End of Demo Ini Processing" ; End of File with optional message
```

The same board file listing looks like:

Project: motor_mod

19 Footprints found.
32 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CCW

Bottom = CCW

RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
C1	100pf	CHIP_D	Top	0.5400	0.7620	270	0.5400	0.7620	0.0250	SMD	2
C2	2.2 25V	C1206	Bottom	0.5400	L 1.1649	90	0.5400	1.1649	0.0250	SMD	2
C3	100pf	CHIP_B	Top	2.5000	1.4215	270	2.5000	1.4215	0.0250	SMD	2
C4	100pf	CHIP_B	Top	2.5000	0.8215	270	2.5000	0.8215	0.0250	SMD	2
C5	2.2 25V	C1206	Bottom	0.9449	1.2800	0	0.9449	1.2800	0.0250	SMD	2
C6	100pf	C0805	Bottom	1.7600	0.7826	90	1.7600	0.7826	0.0250	SMD	2
C7	2.2 25V	C0805	Top	2.0574	1.5800	0	2.0574	1.5800	0.0250	SMD	2
D1		CHIP_B	Top	0.3785	1.5000	0	0.3785	1.5000	0.0250	SMD	2
J104		XYZ Socket	Top	2.1750	L 2.9325	0	2.1750	2.7000	0.1000	Mixed	42
JP1		5X2HDR-100	Top	2.1000	1.8500	0	2.1000	1.8500	0.0250	Thru-Hole	10
JP2		5X2HDR-100	Top	2.8500	1.3000	270	2.8500	1.3000	0.0250	Thru-Hole	10
JP3		5X2HDR-100	Top	2.8500	0.7000	270	2.8500	0.7000	0.0250	Thru-Hole	10
JP4		5X2HDR-100	Top	0.1500	L 0.7000	270	0.1500	0.7000	0.0250	Thru-Hole	10
JP5		3X2HDR-100	Top	1.5000	1.8500	0	1.5000	1.8500	0.0250	Thru-Hole	6
JP6		1X2HDR-100	Top	0.1000	1.4500	180	0.1000	1.4500	0.0250	Thru-Hole	2
Mech1	Antenna support	Mech part	Top	0.7000	3.1000	0	0.7000	3.1000	0.0250	Null	5 *
R1	4.7K 1206	C1206	Top	2.5000	1.1449	270	2.5000	1.1449	0.0250	SMD	2
R2		C1206	Top	2.5000	0.5449	270	2.5000	0.5449	0.0250	SMD	2
R3		C1206	Top	0.6551	1.5000	0	0.6551	1.5000	0.0250	SMD	2
U1		28DIP300_A5	Top	1.4500	L 0.9500	270	1.4500	0.9500	0.0250	Thru-Hole	28
U2		14DIP300	Top	2.0500	1.1000	270	2.0500	1.1000	0.0250	Thru-Hole	14
U3		TO-220	Top	0.9900	1.6000	90	0.9900	1.6000	0.0250	Thru-Hole	3
U101		Dip8	Top	0.0000	2.5500	270	0.0000	2.5500	0.0250	Thru-Hole	8
U104		qfp-32	Top	0.7188	2.5688	0	0.7188	2.5688	0.0250	SMD	32
Y1		8DIP300	Top	0.9500	0.9500	270	0.9500	0.9500	0.0250	Thru-Hole	8

Some comments about Format 0:

RefDes strings can be up to 32 characters long, only the first 8 are displayed. Footprint names can be up to 128 characters long, only the first 20 are displayed. The “L” between the X and Y location values indicates a locked or “Glued” part.

Formats 0 and 1 will only list the first glue spot of each part. For a complete listing, use format 3 or 4.

The Technology column lists parts based on footprint pads. If no pad has a hole the part is classified as "SMD". If all pads have holes, the part is considered "Thru-Hole". If some pads have holes and some not, the part is called "Mixed". This can happen when an otherwise SMD part contains mounting holes and/or holes for alignment pins. If a part has no pads, it is classed as "Null".

The Pins column lists the number of pins from the footprint and is a handy way to spot single pin items like mounting holes and test points that should be omitted from the listing. Also note that all parts with less than two pins and mechanical parts are flagged with a trailing asterisk to aid in identification.

A Format 1 example using the same ini file:

Project: motor_mod

19 Footprints found.
32 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CCW

Bottom = CCW

RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
C1	100pf	CHIP_D	Top	0.5400	0.7620	270	0.5400	0.7620	0.0250	SMD	2
C3	100pf	CHIP_B	Top	2.5000	1.4215	270	2.5000	1.4215	0.0250	SMD	2
C4	100pf	CHIP_B	Top	2.5000	0.8215	270	2.5000	0.8215	0.0250	SMD	2
C7	2.2 25V	C0805	Top	2.0574	1.5800	0	2.0574	1.5800	0.0250	SMD	2
D1		CHIP_B	Top	0.3785	1.5000	0	0.3785	1.5000	0.0250	SMD	2
R1	4.7K 1206	C1206	Top	2.5000	1.1449	270	2.5000	1.1449	0.0250	SMD	2
R2		C1206	Top	2.5000	0.5449	270	2.5000	0.5449	0.0250	SMD	2
R3		C1206	Top	0.6551	1.5000	0	0.6551	1.5000	0.0250	SMD	2
U104		qfp-32	Top	0.7188	2.5688	0	0.7188	2.5688	0.0250	SMD	32
RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
JP1		5X2HDR-100	Top	2.1000	1.8500	0	2.1000	1.8500	0.0250	Thru-Hole	10
JP2		5X2HDR-100	Top	2.8500	1.3000	270	2.8500	1.3000	0.0250	Thru-Hole	10
JP3		5X2HDR-100	Top	2.8500	0.7000	270	2.8500	0.7000	0.0250	Thru-Hole	10
JP4		5X2HDR-100	Top	0.1500 L	0.7000	270	0.1500	0.7000	0.0250	Thru-Hole	10
JP5		3X2HDR-100	Top	1.5000	1.8500	0	1.5000	1.8500	0.0250	Thru-Hole	6
JP6		1X2HDR-100	Top	0.1000	1.4500	180	0.1000	1.4500	0.0250	Thru-Hole	2
U1		28DIP300_A5	Top	1.4500 L	0.9500	270	1.4500	0.9500	0.0250	Thru-Hole	28
U2		14DIP300	Top	2.0500	1.1000	270	2.0500	1.1000	0.0250	Thru-Hole	14
U3		TO-220	Top	0.9900	1.6000	90	0.9900	1.6000	0.0250	Thru-Hole	3
U101		Dip8	Top	0.0000	2.5500	270	0.0000	2.5500	0.0250	Thru-Hole	8
Y1		8DIP300	Top	0.9500	0.9500	270	0.9500	0.9500	0.0250	Thru-Hole	8
RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
J104		XYZ_Socket	Top	2.1750 L	2.9325	0	2.1750	2.7000	0.1000	Mixed	42
RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
Mech1	Antenna support	Mech part	Top	0.7000	3.1000	0	0.7000	3.1000	0.0250	Null	5 *
RefDes	Component Value	Footprint	Side	Loc X	Loc Y	Rot	Glue X	Glue Y	Glu Dia	Technology	Pins
C2	2.2 25V	C1206	Bottom	0.5400 L	1.1649	90	0.5400	1.1649	0.0250	SMD	2
C5	2.2 25V	C1206	Bottom	0.9449	1.2800	0	0.9449	1.2800	0.0250	SMD	2
C6	100pf	C0805	Bottom	1.7600	0.7826	90	1.7600	0.7826	0.0250	SMD	2

Some comments about Format 1:

The same capabilities and limitations of Format 0 apply to Format 1. Additionally, as in the example above where no *Thru-Hole*, *Mixed* or *Null* parts were found on the *Bottom* side, if a category is empty, no header is listed.

Format 2 examples

Without the Info column:

```
Report Origin = (0.0, 0.0)
Units used = "mil"
"RefDes", "Layer", "LocationX", "LocationY", "Rotation"

"C1", "Top", "540", "762", "90"
"C2", "Top", "600", "1245", "90"
"C3", "Top", "2500", "1422", "90"
"C4", "Top", "2500", "822", "90"
"C5", "Top", "955", "1280", "0"
"C6", "Top", "1760", "763", "90"
"C7", "Top", "2057", "1580", "0"
"D1", "Top", "379", "1500", "0"
"H1", "Top", "150", "150", "0"
"H2", "Top", "150", "1850", "0"
"H3", "Top", "2850", "1850", "0"
"H4", "Top", "2850", "150", "0"
"JP1", "Top", "2100", "1850", "0"
"JP2", "Top", "2850", "1300", "90"
"JP3", "Top", "2850", "700", "90"
"JP4", "Top", "150", "700", "90"
"JP5", "Top", "1500", "1850", "0"
"JP6", "Top", "100", "1450", "180"
"R1", "Top", "2500", "1145", "90"
"R2", "Top", "2500", "545", "90"
"R3", "Top", "655", "1500", "0"
"U1", "Top", "1450", "950", "90"
"U2", "Top", "2050", "1100", "90"
"U3", "Top", "990", "1600", "270"
"Y1", "Top", "950", "950", "90"
```

And with:

```
Report Origin = (0.0, 0.0)
Units used = "mil"
"RefDes", "Component Value", "Layer", "LocationX", "LocationY", "Rotation"

"C1", "100pf", "Top", "540", "762", "270"
"C2", "2.2 25V", "Bottom", "540", "1165", "90"
"C3", "100pf", "Top", "2500", "1422", "270"
"C4", "2.2 25V", "Top", "2500", "822", "270"
"C5", "100pf", "Bottom", "945", "1280", "0"
"C6", "2.2 25V", "Bottom", "1760", "783", "90"
"C7", "", "Top", "2057", "1580", "0"
"CIR1", "", "Top", "1000", "500", "0"
"D1", "", "Top", "379", "1500", "0"
"J104", "", "Top", "2175", "2933", "0"
"JP1", "Add later...", "Top", "2100", "1850", "0"
"JP2", "Add later...", "Top", "2850", "1300", "270"
"JP3", "Add later...", "Top", "2850", "700", "270"
"JP4", "Add later...", "Top", "150", "700", "270"
"JP5", "Add later...", "Top", "1500", "1850", "0"
"JP6", "Add later...", "Top", "100", "1450", "180"
"Mech1", "Antenna support", "Top", "700", "3100", "0"
"R1", "something funky", "Top", "2500", "1145", "270"
"R2", "something funky", "Top", "2500", "545", "270"
"R3", "something funky", "Top", "655", "1500", "0"
"U1", "", "Top", "1450", "950", "270"
"U2", "", "Top", "2050", "1100", "270"
"U3", "", "Top", "990", "1600", "90"
"U101", "", "Top", "0", "2550", "270"
"U104", "", "Top", "738", "2588", "0"
"Y1", "", "Top", "950", "950", "270"
"part1", "", "Top", "1150", "2200", "0"
```

Format 3

With this format the user selects which items are listed, the column order and, optionally, change the default data column heading. Components are listed by sorted reference designation only without regard to side or technology.

```
-U Inch ; Set units
-I C1 "Digikey XXXXCT-ND" ; Add info to C1

-F 3 ; Select format 3 and reset the column list
-H 0 ; First column is refdes
-H 3 34 "Component Description" ; Combined Value and Info with new heading
-h 10 ; Technology
-H 9 1 "X,Y Location" ; Headings with spaces must be quoted
-H 6 1 Rotation ; New heading will define width
-H 5 ; Side
-H 11 ; Pin count

-R Top 1 ; Set top and bottom rotations
-R Bottom 0 180 1

-E "Generating Component Placement"
```

In this example, the .ini file segment shown above produces:

Project: motor_mod

20 Footprints found.
33 Parts found.

Units: INCH

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CCW

Bottom = CW + 180 + Centroid Rotation

RefDes	Component Description	Tech	X,Y Location	Rotation	Side	Pins
C1	10 uF, 16V Tant Digikey XXXXCT-ND	SMD	0.5400, 0.7620	270	Top	2
C2		SMD	0.5400, 1.1649	90	Bottom	2
C3		SMD	2.5000, 1.4215	270	Top	2
C4		SMD	2.5000, 0.8215	270	Top	2
C5		SMD	0.9449, 1.2800	180	Bottom	2
C6		SMD	1.7600, 0.7826	90	Bottom	2
C7		SMD	2.0574, 1.5800	0	Top	2
C1R1	Mounting Hole	Null	1.0000, 0.5000	0	Top	0*
C1R2		Null	1.6900, 0.0300	0	Top	0*
D1		SMD	0.3785, 1.5000	0	Top	2
H1		PTH	0.1500, 0.1500	0	Top	1*
H2		PTH	0.1500, 1.8500	0	Top	1*
H3		PTH	2.8500, 1.8500	0	Top	1*
H4		PTH	2.8500, 0.1500	0	Top	1*
J104	Edge-40-01-L	Mixed	2.1750, 2.9175	0	Top	42
JP1		PTH	2.1000, 1.8500	0	Top	10
JP2		PTH	2.8500, 1.3000	270	Top	10
JP3		PTH	2.8500, 0.7000	270	Top	10
JP4		PTH	0.1500, 0.7000	270	Top	10
JP5		PTH	1.5000, 1.8500	0	Top	6
JP6		PTH	0.1000, 1.4500	180	Top	2
Mech1	PICey thing	Null	0.7000, 3.1000	0	Top	5*
part1		SMD	1.1500, 2.2000	0	Top	3
R1		SMD	2.5000, 1.1449	270	Top	2
R2		SMD	2.5000, 0.5449	270	Top	2
R3		SMD	0.6551, 1.5000	0	Top	2
TP101		SMD	1.0000, 0.5000	0	Top	1*
U1		PTH	1.4500, 0.9500	270	Top	28
U2		PTH	2.0500, 1.1000	270	Top	14
U3		PTH	1.0000, 1.6000	90	Top	3
U101		PTH	0.0000, 2.5500	270	Top	8
U104		SMD	0.6875, 2.5875	0	Top	32
Y1		PTH	0.9500, 0.9500	270	Top	8

Format 4

Like format 3, this format lets the user define data type, order and optionally, change the column heading but the listing is separated into groups based on technology and board side like format 1.

```
-F 4          ; Reset the output format and build the glue list
-H 0          ; refdes first
-h 5          ; side
-h 10         ; tech
-H 18 Spots   ; glue spot count next
-H 13         ; glue location and size: [x.xxx, y.yyy, d.ddd] [...]

-U Metric     ; switch to mm for output

-E "Generating Glue List"      ;
```

The .ini file segment shown above will produce:

Project: motor_mod

20 Footprints found.
33 Parts found.

Units: MM

Note: Bottom side coordinates are not mirrored.

Rotation is in Degrees:

Top = CCW

Bottom = CCW

RefDes	Side	Tech	Spots	Adhesive X,Y,Dia
C1	Top	SMD	1	[13.716, 19.355, 0.635]
C3	Top	SMD	1	[63.500, 36.106, 0.635]
C4	Top	SMD	1	[63.500, 20.866, 0.635]
C7	Top	SMD	1	[52.258, 40.132, 0.635]
D1	Top	SMD	1	[9.614, 38.100, 0.635]
part1	Top	SMD	1	[29.210, 55.880, 0.635]
R1	Top	SMD	1	[63.500, 29.080, 0.635]
R2	Top	SMD	1	[63.500, 13.840, 0.635]
R3	Top	SMD	1	[16.640, 38.100, 0.635]
TP101	Top	SMD	1	[25.400, 12.700, 0.635]
U104	Top	SMD	1	[17.462, 65.722, 0.635]

RefDes	Side	Tech	Spots	Adhesive X,Y,Dia
H1	Top	PTH	1	[3.810, 3.810, 0.635]
H2	Top	PTH	1	[3.810, 46.990, 0.635]
H3	Top	PTH	1	[72.390, 46.990, 0.635]
H4	Top	PTH	1	[72.390, 3.810, 0.635]
JP1	Top	PTH	1	[53.340, 46.990, 0.635]
JP2	Top	PTH	1	[72.390, 33.020, 0.635]
JP3	Top	PTH	1	[72.390, 17.780, 0.635]
JP4	Top	PTH	1	[3.810, 17.780, 0.635]
JP5	Top	PTH	1	[38.100, 46.990, 0.635]
JP6	Top	PTH	1	[2.540, 36.830, 0.635]
U1	Top	PTH	1	[36.830, 24.130, 0.635]
U2	Top	PTH	1	[52.070, 27.940, 0.635]
U3	Top	PTH	1	[25.400, 40.640, 0.635]
U101	Top	PTH	1	[0.000, 64.770, 0.635]
Y1	Top	PTH	1	[24.130, 24.130, 0.635]

RefDes	Side	Tech	Spots	Adhesive X,Y,Dia
J104	Top	Mixed	3	[38.100, 68.580, 1.000] [55.372, 68.580, 2.000] [72.136, 68.580, 1.000]

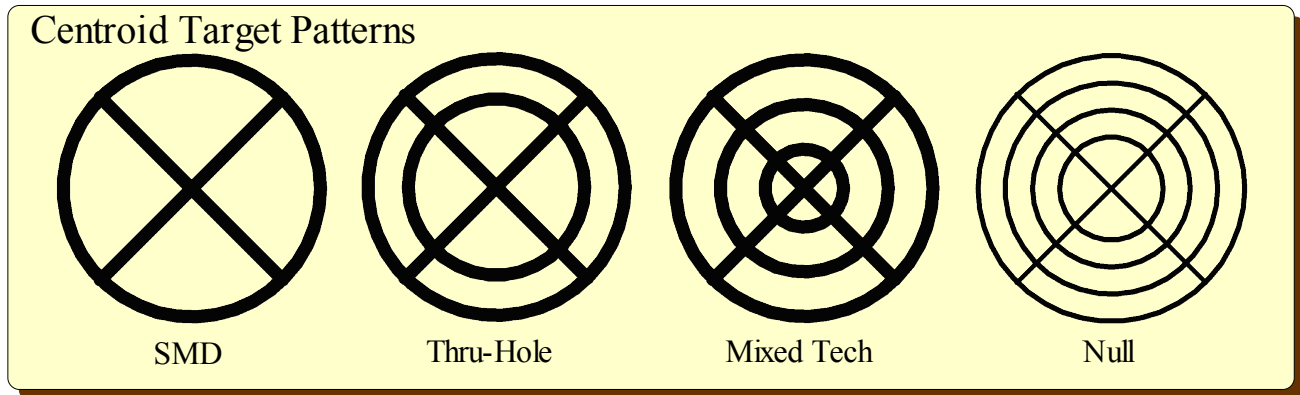
RefDes	Side	Tech	Spots	Adhesive X,Y,Dia
CIR1	Top	Null	0	
CIR2	Top	Null	0	
Mech1	Top	Null	0	

RefDes	Side	Tech	Spots	Adhesive X,Y,Dia
C2	Bottom	SMD	1	[13.716, 29.588, 0.635]
C5	Bottom	SMD	1	[24.000, 32.512, 0.635]
C6	Bottom	SMD	1	[44.704, 19.878, 0.635]

Gerber Check plots

FpcPlace can generate Gerber files that include both placement and glue spot location data. These files can be used in a Gerber viewer to overlay the board data and verify placement. At most, two files, named **TopPlace.gbr** and **BottomPlace.gbr** are created. If a side has no unsuppressed parts, that side's file is not generated.

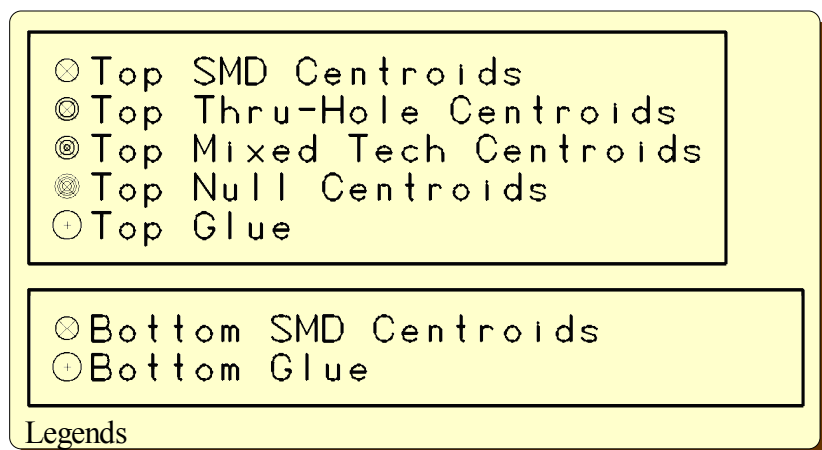
The Gerber files use, by default, 100 mil diameter targets to mark the centroid location of each unsuppressed part. As shown below, each class of part uses a unique target shape.



Also by default, 120 mil diameter targets, shaped as shown, are used to mark glue locations.

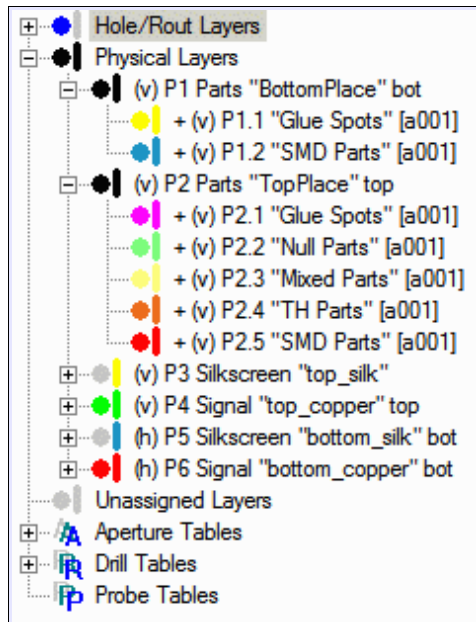
This size and shape allows the glue target to overlay a placement target and remain visible.

The target scaling command, -T, can be used to adjust target diameters over a limited range.



Each file includes a target legend. Only those items used are listed. The legends by default are located with the top left corner at 0.5, -0.5 but can be placed anywhere if the optional location is included in the -C command.

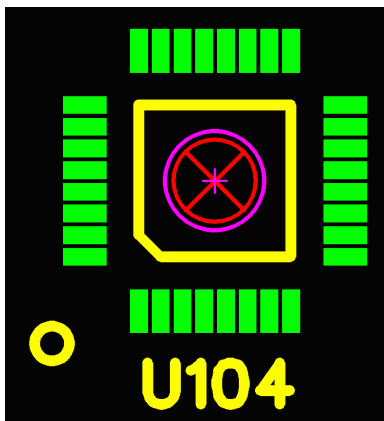
If both files are generated, the bottom side legend is located 100 mils below the top legend.



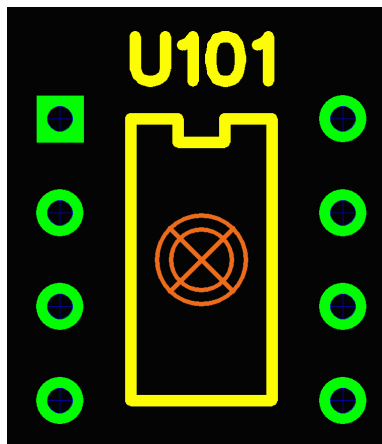
In the Gerber files, each object class is placed into a separate positive data layer. This allows the classes to be assigned unique colors for easy identification. The illustration at left shows how **GcPrevue** can be configured to take advantage of this feature.

The data layers are created by using empty clear data layers as separators. Some Gerber viewers may not tolerate empty data layers in the file. If this is the case with your viewer, the clear data layer separators can be omitted and all objects placed within a single data layer.

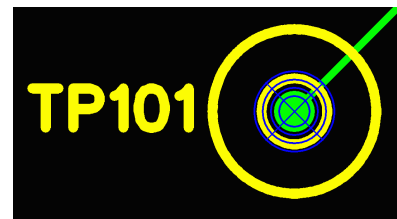
Some Target Examples:



SMD part with glue



Thru-Hole part without glue



Unsuppressed Null part

Appendix A – Software limits

EOF message	128 characters max
Footprints	1024 max
Footprint exceptions	1024 max
Footprint names	128 characters max
Font path	128 characters max
Parts	2048 max
Pin names	16 characters max
RefDes strings	32 characters max
Text lines	1024 characters max
Target Scale Factor	0.010 to 1.350 (out of range values are forced into range)

User Guide Revision Record:

Ver	Date	Comments
1.10	3 July 06	Initial public release to FreePCB forum
1.20	8 July 06	New commands added, examples improved, appendix cleaned up.
1.30	15 July 06	Gerber check plot and Target scaling commands added.
1.31	17 July 06	Quoted footprint names and format 2 info added.
1.32	19 July 06	Font path command added.
1.33	10 Nov 07	Metric part bug fix. Added listing units command. Added glue spec to Info command.
1.36	27 Jan 08	FreePCB footprint centroid record added to override bounding box center.
1.40	16 Nov 08	User defined output formats added. Displayed rotation enhanced.
1.41	21 Nov 08	Included files, explicit source/destination and configuration file names added.