# Advanced CircuitCAM Features

## Edit Menu Features

### Duplicate

The ‘Duplicate’ function is very useful for copying and pasting objects, whether single or multiple objects.

This is accessed by , selecting the object, then, use a combination of the ‘Control’ key and the ‘Space Bar’ and your segment will duplicate and paste. Drag the duplicate around the screen until you have reached a desired location , and click once with the left mouse cursor to place it.

### Move

The Move command is utilized by highlighting a selection. Now simply press the Space Bar This allows you to use your mouse cursor to drag and drop the selection at a desired point.

### Mirror/Rotate relative

The ‘Relative’ mirror/rotate option, will rotate a selected object around a chosen anchor point. Simply select the object or objects to be rotated, then choose the relative rotation value from the edit menu command.

### Mirror/Rotate Absolute

An ‘Absolute’ mirror/rotate, will rotate a flashed object around it’s zero point based upon an absolute reference zero point. Simply select the flashed object or objects to be rotated, and then choose the absolute rotation command from the edit menu.

## Design Rule Check

The design rule check is provided to give you an idea of what traces or pads might me violating a minimal spacing rule that you may set up, between traces and pads, and other parts of your drawing. There are two basic modes of the design rule check function. The first, is in 'Inter Min Spacing'. This option will allow you to test for your minimal spacing rules between two differing layers. The second mode, is 'Intra Min Spacing, which allows you to check for Design Rule violations on the same layer. Once you have set up your design rules, click on the run button to perform the check.

## Diverse

The Diverse SubMenu contains a number of utilities:

## Close Curve

The 'Close Curve' function, is to create a closed outline path of a continuous line for any selected open path.

## Path to Polygon

The 'Path to Polygon' feature, will allow you to turn an open path object into an actual Polygon. Whenever a path is turned into a polygon, the path loses its line width information.

## Object to Polygon

This operation will turn any object in your drawing into a polygon. No real visual change will take place, however, new markers will be generated for this object.

## Convert to Closed Outline Path

Using this option, you can turn any solid object or polygon into an open path object, which will have a line width of zero.

## Center Point

Center point, will take a selected object, and calculate out the center point of all the lines, and place a cursor marker at the calculated center point.

## Mass Point

The ‘Mass Point’ selection, will calculate out the center of an object, and place a marker here.

## Set Cursor

The ‘Set Cursor’ function, allows you to set your cursor at a direct point in your drawing, either from absolute zero, or from the last known relative point.

## Set Anchor

The ‘Set Anchor’ command will set an anchor point on a selected object or polygon, based upon where your cursor is presently located. All manipulations on this object are performed based upon this anchor point.

## Set Zero Point

The ‘Set Zero Point’ function will set a new absolute zero point for the drawing, which all objects take their measurements from. This new zero point can either be within the bounds of the drawing, or outside of the board design. In order to use this function, you must first select the zero point, either on your drawing, or you can use the ‘set cursor’ command to set up an arbitrary point anywhere else on the screen area.

## Move Layer to Zero

This option works similar to the ‘Set Zero Point’ function, but instead, works on only one layer at a time. This selection will set the currently selected LAYER to the predefined zero point.

## Measure

The measure function is reached from a 'right' mouse click, and will measure from one anchor point to the stretch of the cursor. Left click the mouse button to set the new measuring anchor point.

## Properties

The 'Properties' function, will display a dialog box for the currently selected object. In this dialog box, you can make changes to the parameters of the object.

## *Insert Menu*

The Insert menu, contains many of the same items found on some of the tool bars. For more information on this menu function, please refer back to the section titled "CircuitCAM : Introduction to Software Interface".

## *Config Menu*

The configuration menu is a very large section, where the advanced user can set up and maintain a variety of jobs and settings. There are three subsections to this menu item, and we will go over the basics of each section.

## Format Configurations

The Format Configurations submenu of the CONFIG menu has the following configurations:

- **Gerber –Aperture List**

In the Gerber/Aperture list, you can do two things. First, if you double click on any of the resulting aperture lists that you see in here, it will bring up a list of imported apertures. You can either examine or change any of the information, in this aperture listing. Secondly, right click on the aperture list, or, any of the apertures in the list, to change the properties of the list or the aperture.

- **Excellon – Tool List**

The Excellon Tool List, is a listing of imported tool apertures. The main difference between the Gerber list and the Excellon list, is that, while a gerber aperture can be almost any shape, the Excellon aperture is only one shape..circle.

- **LPKF Circuit Board Plotter – Tool List**

The LPKF Circuit Board Plotter tool list is different than the rest of the lists in the Config menu. This section, actually contains a list of specific tool names, and their individual properties. In this listing, we will find the tool list for each available job you can perform.

If you go into the first list, by double clicking it with the left mouse button, you will be presented with a listing of all the drill tools available. In this list, you can add, remove, or change the properties of any tool in here.

If you double click on any of the tools that are derived from flash information, you will see a graphical representation of the tool's shape. Draw-only tools, cannot be edited graphically.

In this dialog box the tool information, can be reached by right clicking the tool You will find all the information about the tool, including it's shape and the size, as well as the capture intervals. The names of the tools found in these lists, must match up with the names in the BoardMaster program.

Also, it is imperative that the tool capture intervals be correct, or the wrong tool could be assigned to the board design.

## Job Configurations

The Job configurations submenu, has four general sections, however, the Stencil section is only available for the users of the laser stencil version of the software. Whenever you double click on one of these jobs, you will be presented with a listing of jobs available. Some of these listed jobs, contain submenus of jobs.

In the lowest submenu that you can reach in each job, you must right click to bring up the properties of each sub job in this list. In these dialog boxes, you can set or reset the parameters of the job operation, each one depending upon what the job performs. You can also create your own custom jobs in these lists, set up the parameters, and save them as custom jobs.

## Insulate Settings

The ‘Insulation Settings’ configuration listing, is the same dialog box found under the menu ‘Edit/Insulate’. Refer back to the section titled ‘CircuitCAM Basics: Setup Insulate Parameters’ for information on this function.

## Export Settings

The ‘Export Settings’ list contains information about the parameters for each type of export job. When you move into the individual export job lists, you will see, on the bottom level, the list of task’s, and their destinations.

In the left column, is the task name, which directly corresponds to the various ‘layers’ in the Board Drawing.

The second column contains the tool list that will be used with this layer/task.

Located in the third column, is the destination phase that the task will be output to.

The phase column, corresponds to the BoardMaster software phases. These phases must be named exactly the same as the phases listed in the BoardMaster software, or the task will not show up in your BoardMaster Job.

## General Setting

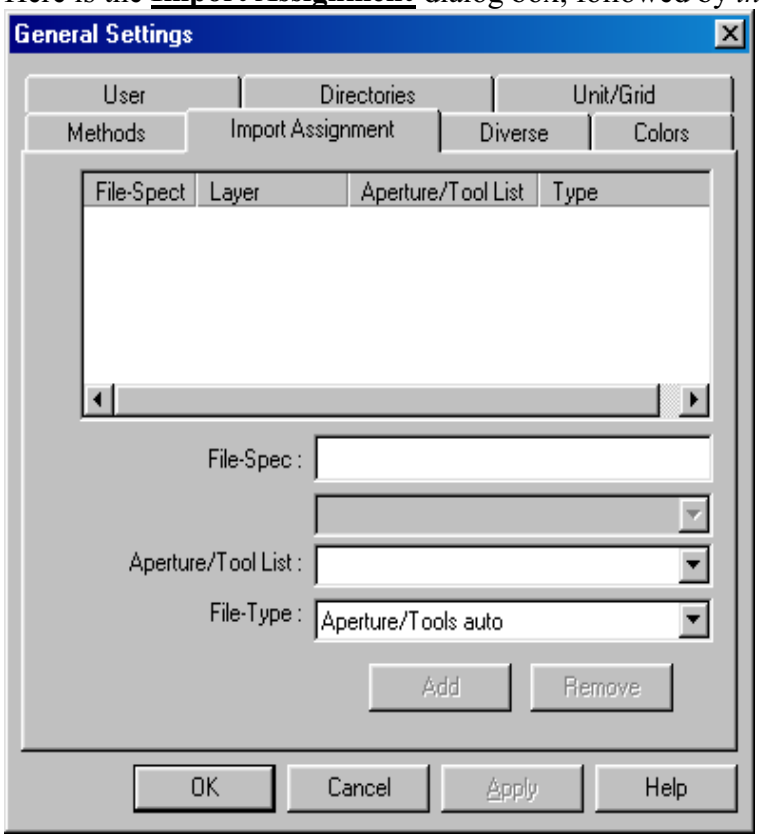
The General Settings Dialog box, is where all of the main system parameters are set. The following is an explanation of the various settings available here, and how to utilize them.

## Methods

This dialog box, allows you to set up methods for drawing new objects, the type of cursor, and a set up method for manipulating one of the path/polygons.

## Import Assignments

**Import Assignments** are extremely useful for automating the *import function* in CircuitCAM. Here is the **Import Assignment** dialog box, followed by *instructions* on how to *assign imports*.




You first start with the dropdown box labeled 'File-Type'. Choose what type of file you are going to import, be it GerberX, Gerber, aperture, or an Excellon file. If you were importing an aperture file, you would choose the 'Aperture/Tools select' option.

The next drop down box to input information in,, is the 'File-Spec'. This is where you would specify the name of the file to be imported as the chosen file-type. You may include in a wildcard, or, an astrich symbol, to take the place of various names of the files.

There just needs to be one common set of characters that stays the same, for that layer file. An example of a naming convention, would be, toplayer.*, or, *.top. Either one would signify that this is the top layer, and that the rest of the characters can vary, for different board designs.

The next step, once you have the file type and file spec defined, depends upon whether it is an aperture file or a layer file. If it is an Aperture file, you would have selected the file type to be Aperture/Tools, and the next step, would be to select the Template, or, the translation file for reading in the Aperture file from the list in the drop down box. The last step for an aperture file is to name a tool list, which generally should follow the name of the aperture list itself. Then, click on the 'Add' button, to add the import assignment into the import job file.

If you had chosen a Gerber file to import, then the next step would be to choose the Layer that you want the file to be transferred to. This is done using the layer drop down box. The last step to take, for Gerber data, is specifying the name of the aperture/tool list that you want to use with this Gerber file.

If you are reading in a GerberX file, then create a list name that follows after the imported GerberX file. If you are importing a GerberD file, then you will want to use the name of the aperture file that you have previously defined for importation in this dialog box.

Once you have finished with the file information, once again, click on the 'Add' button to add this file specification to the list of import jobs.

You will need to add the remaining sets of import assignments for each layer that you would need to import for a board design. If you need to make any corrections to the data you have entered, simply single click the mouse on the incorrect data, make your adjustments to the data, and then click on the 'Apply' button.

## Diverse

The 'Diverse' settings tab, is where you are able to make different global settings to the software. You can set up the breakout tab width, finite resolution of polygons, and set up the number of available 'undo' operations.

## User

This section of the general settings, is where you input the information about the user, the organization you are with, location, the all important software serial number and software enabling numbers.

## Directories

The 'Directories' tab, allows you to specify a different directory for the Aperture templates and for the New, or, 'cat' file templates.

## Unit/Grid

The Unit/Grid tab, specifies the display modes of the cursor, as well as allowing you to set up the display modes of the on screen grid and the snap to grid. You can also set up the unit of measurement here as well.