Convert Pads to Components

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Introduction

This application note shows how to convert data from a layer with pads to component data.

To learn more about what components are in PentaLogix software please read the separate application note called "Components in CAM Software".

The main reason to do this conversion is to generate a centroid file for assembly when component data is otherwise not available. When importing ODB++ data in many cases the component info is already available and one can generate centroid data directly from it and there is no need to use this conversion step.

Any pad data can be used for conversion, but the most useful layer types are the solderpaste, soldermask or copper layers.

Steps for Conversion

Before you start conversion on a layer, it is best to make a copy of that layer (to an empty layer) and work on that layer so as to leave the original pad data unchanged.

1. Select several pads that are part of a component
2. Do "**Components > Convert Footprints to Components**"
3. You will be prompted for the prefix of the reference designator. Usually this is one letter, like "R", "C", "U" etc., but any prefix is accepted.
4. The selected group as well as any similar group of pads in the layer is converted to components
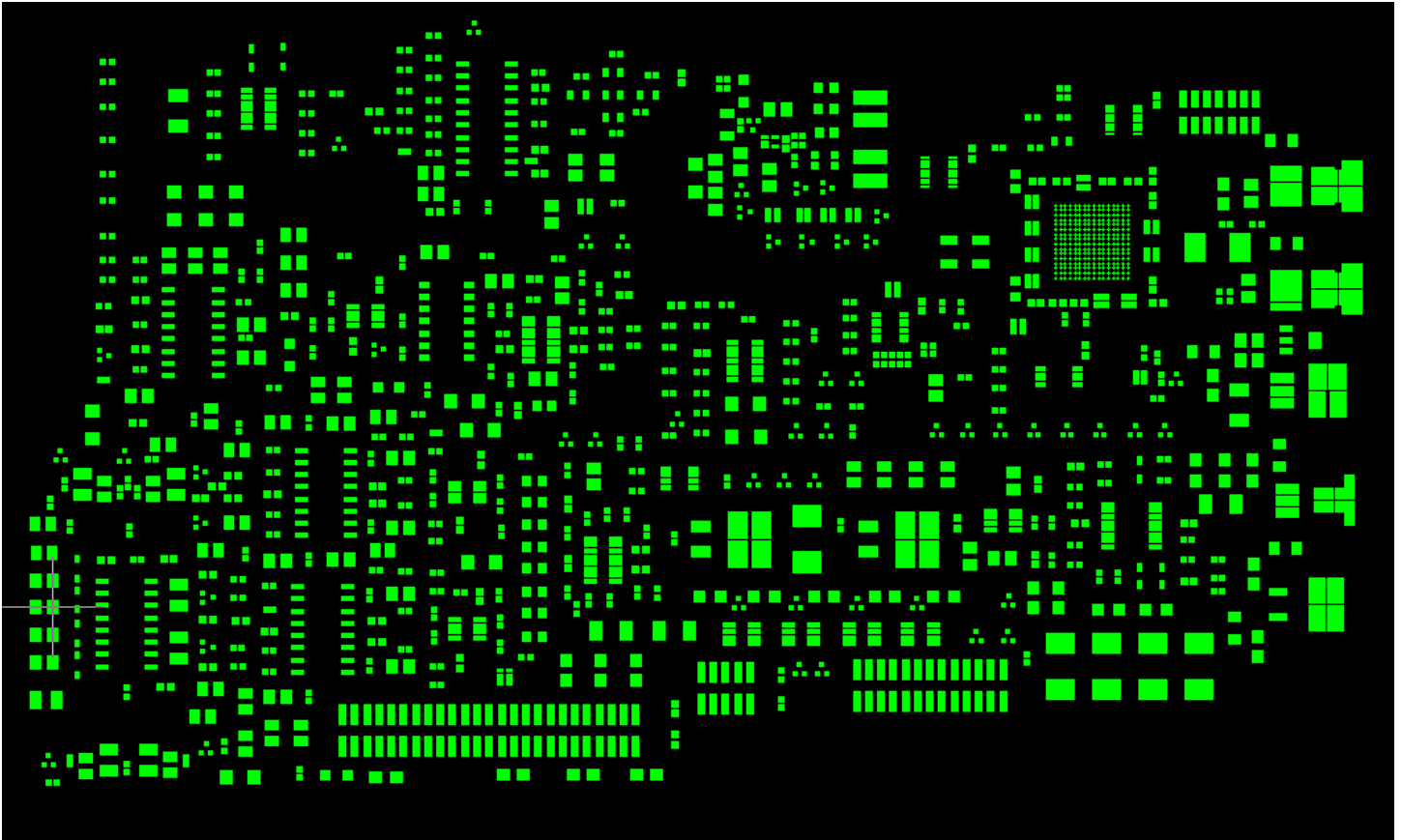5. When done with all components, do "**Components > Save Centroid File**"

As you convert to components, you may want to change the reference designators that are automatically generated. This is both for the purpose of matching what appears on the silkscreen layer as well as because some groups of pads will the labeled incorrectly. For instance, a footprint of two pads can match resistors as well as capacitors.

To change the reference designators use "**Components > Change Reference Designator Tool**". Once active you can click on a component and a dialog will ask for the new reference designator.

The other issue is that the automatic conversion cannot always detect the correct pin 1 location. It may be necessary, after the conversion, to set the correct orientation. To do this use "**Components > Change Orientation Tool**". Examine the converted data and where pin one is not in the correct position click on the component. You may need to click several times in the cases where pin 1 can be in one of four conrners.

Example

Here is a sample layer with pad data (this is a solderpaste layer):
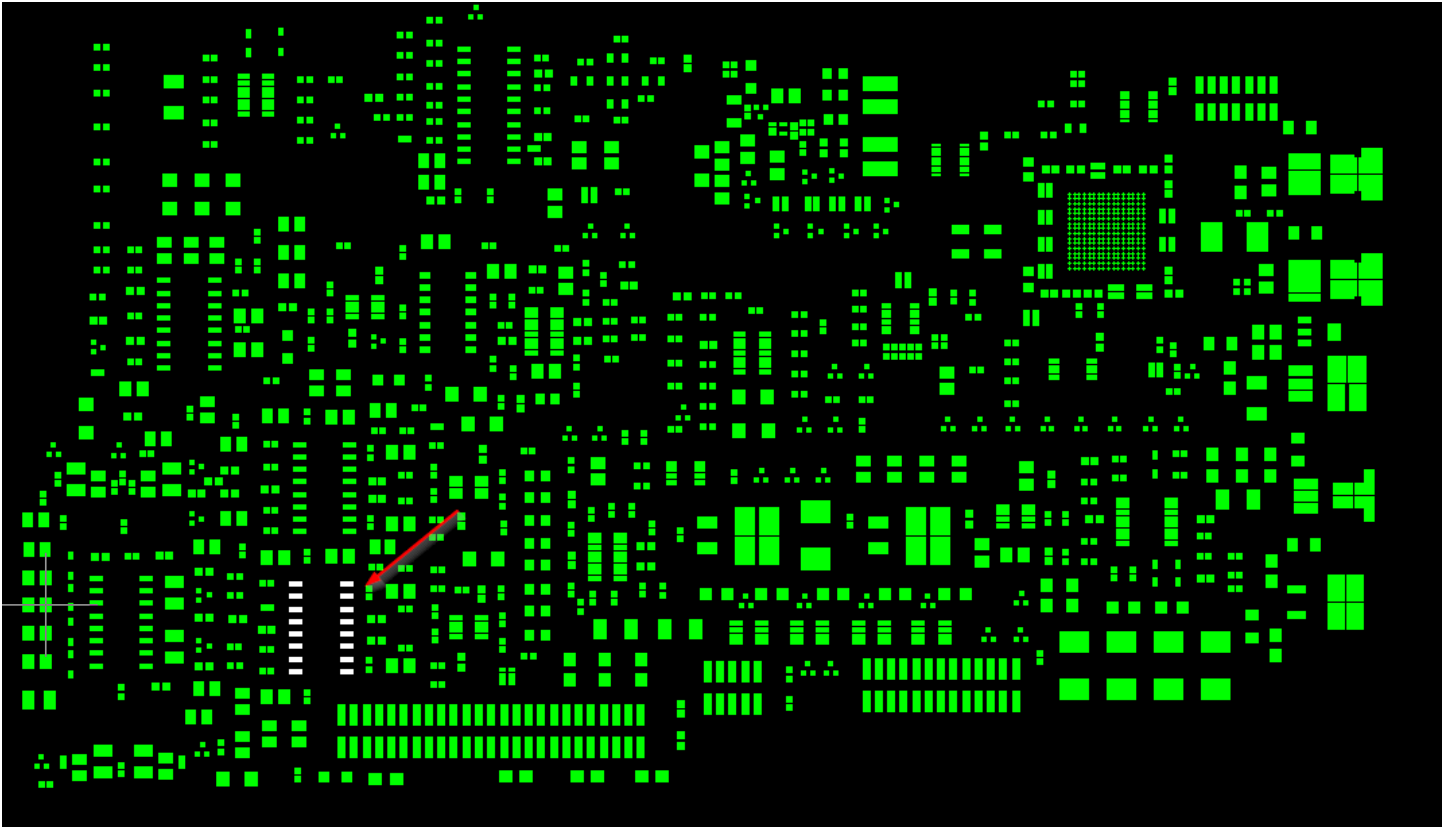

Select a set of pads that you know are part of a component.

Best practice is to start with the most complex components and go towards simpler one (with fewer pads).

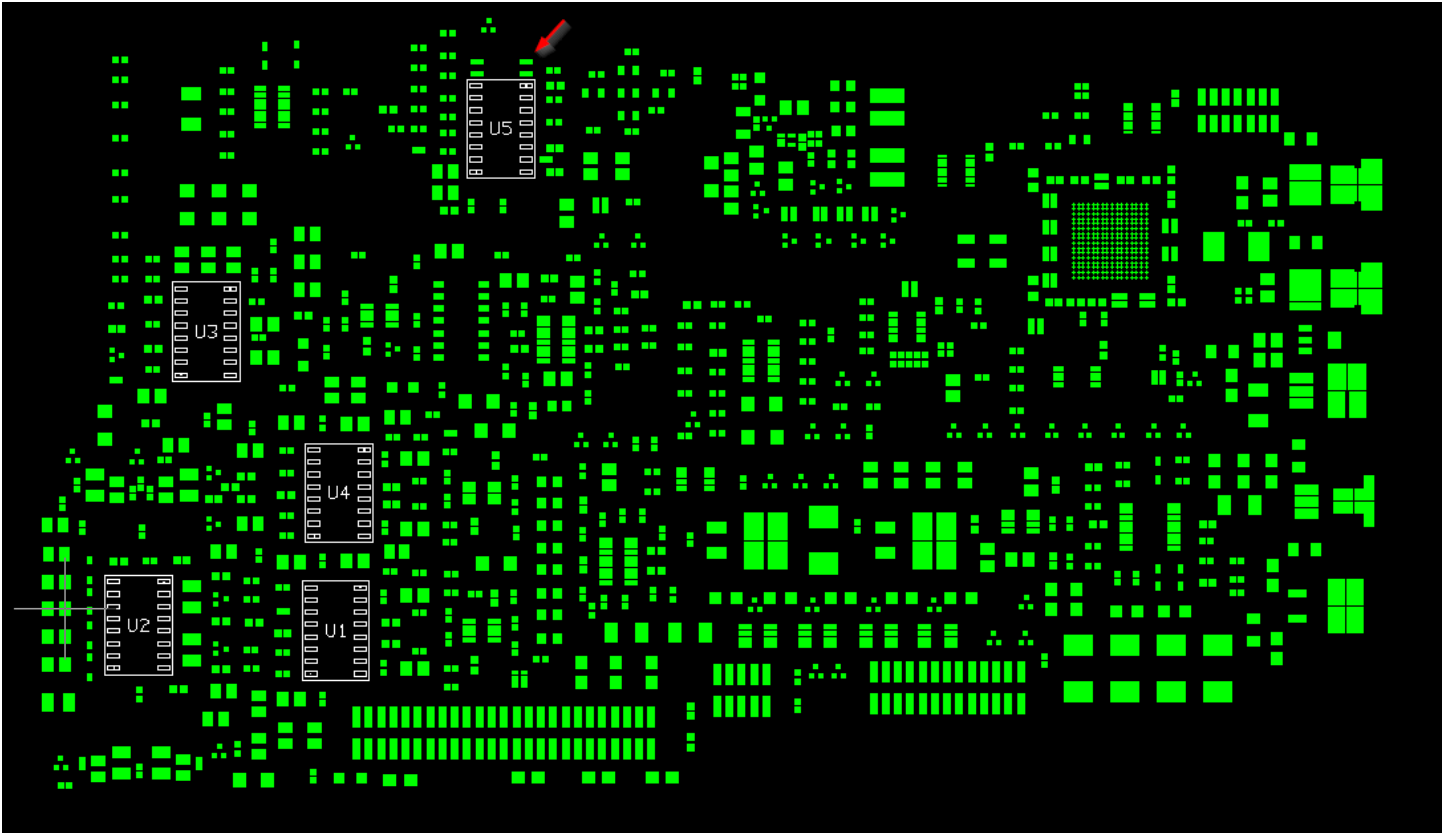To illustrate why this is needed look at the steps below.

We select this group:

and do the conversion.
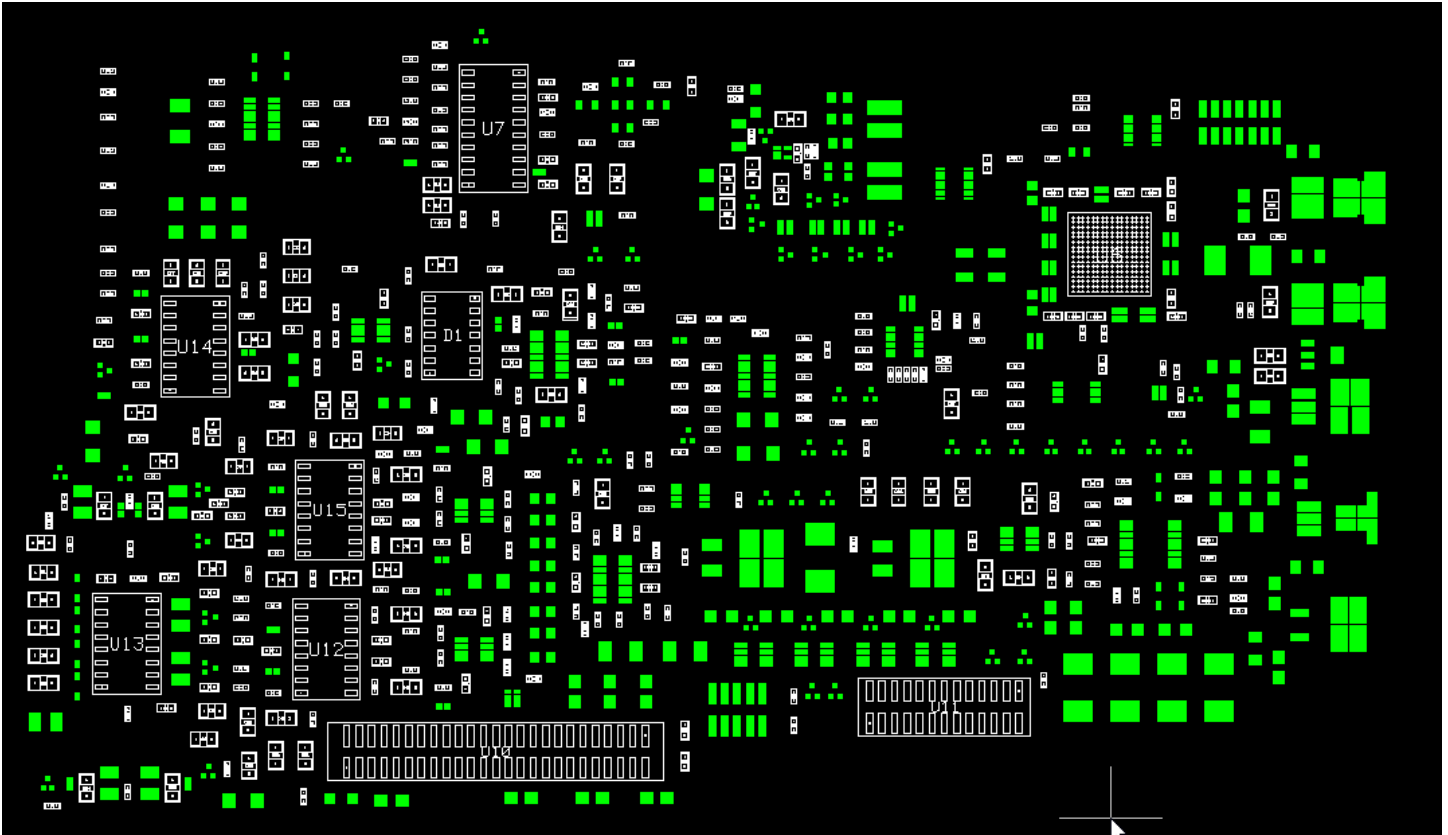
Result is shown below:

You can see the problem where the arrow is pointing. A component with a larger number of pads was detected incorrectly.

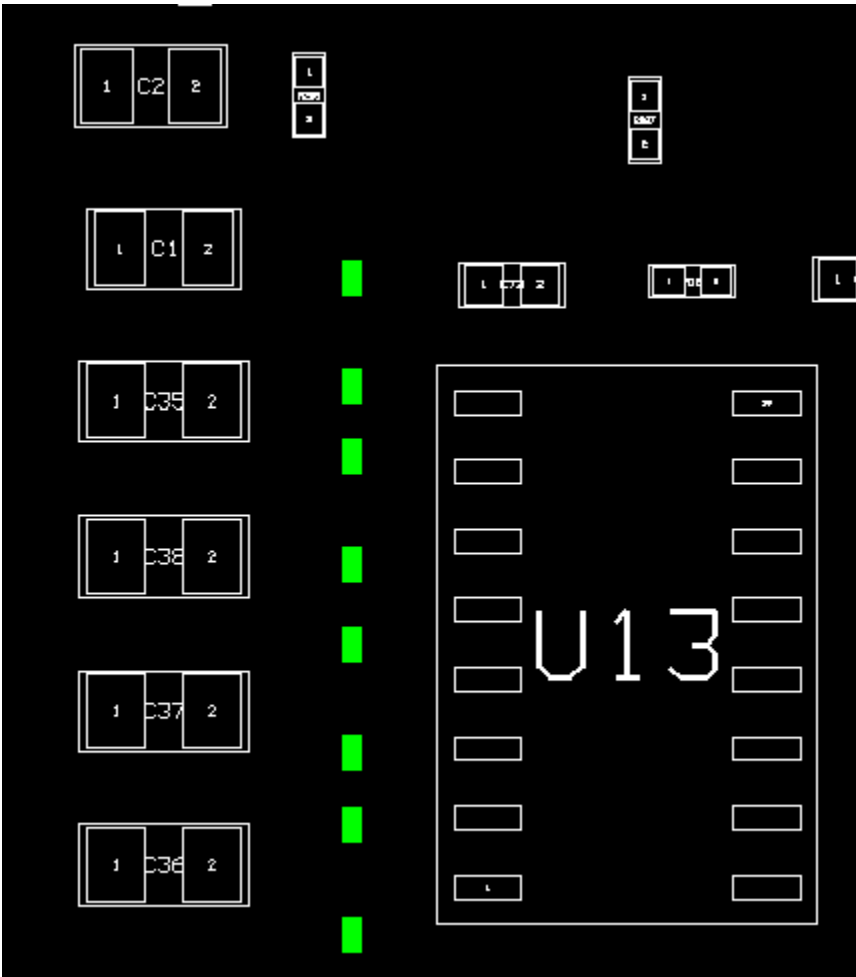So, start with the more complex and go towards the simpler.

After a few steps the result will look like this:
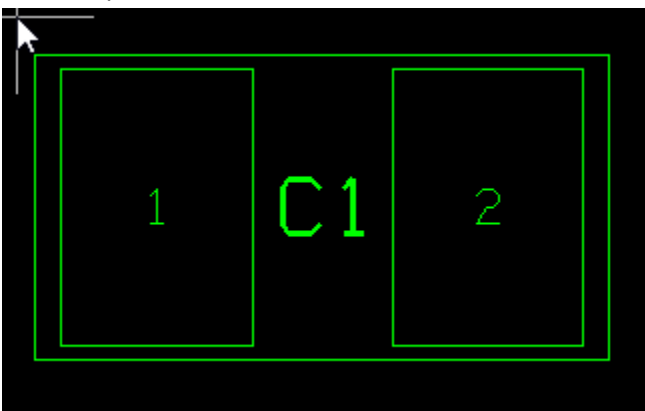
Zoomed in on an area:

Adjustment Steps

When looking at both the converted data and the silkscreen layer adjustment steps may be necessary.
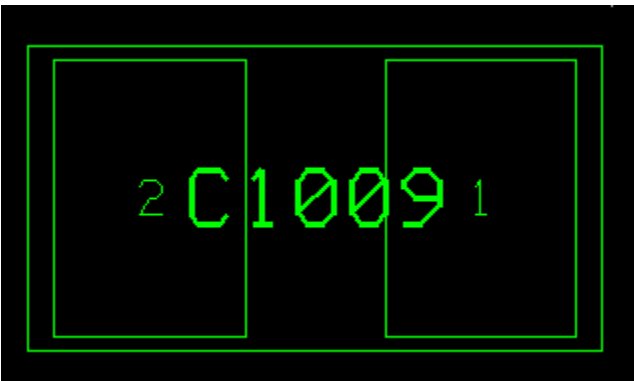
An example is shown below.

Looking at the silkscreen layer we see.

So we change both the reference designator and the rotation with the tools mentioned before and get:

Saving a Centroid File

This can be done with "**Components > Save Centroid File**".

It will save a .csv file and you will be prompted for the separator character.

The units are the current units and the angles are counterclockwise.

The columns are:

- Reference Designator
- Center X
- Center Y
- Angle
- Side

Note that the components will be save relative to the origin ((0,0) location) in the CAM software.

If that is not the reference point you want, you need to first set the origin with "**Setup > Absolute Origin**".

Components on Bottom Layer

For components on the bottom layers, the processing is more complicated.

You need to work on a mirrored copy of the pads file. Use "**Edit > Edit Selection > Mirror X**".

Before saving a centroid file from the converted layer, set the layer type to: "**CML**" (Components Lower).