Productivity Toolbox User Guide

Advanced Mirror

February 2017

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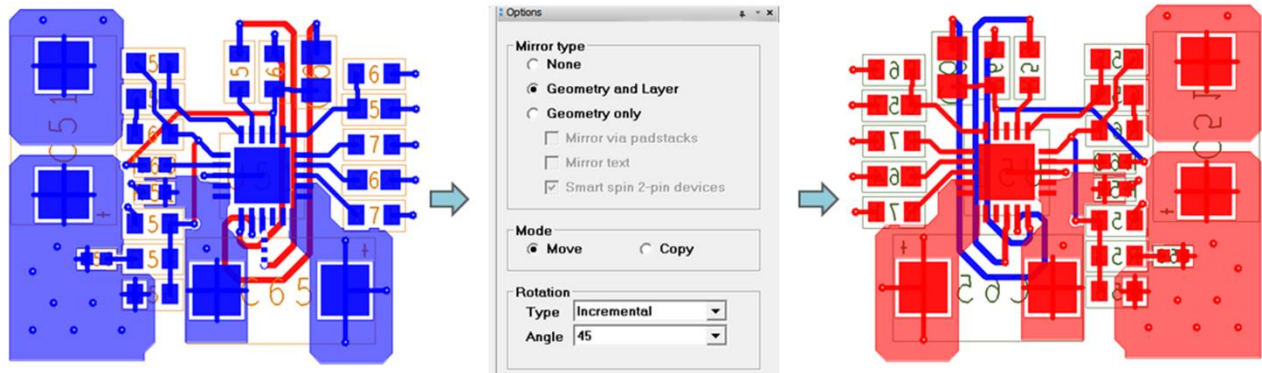# Table of Figures

1 Introduction

Advanced Mirror is an application that allows users to perform mirror operations while moving or copying a group of selected objects. Mirroring can be performed either across subclasses or on the same subclass (*Geometry only*).
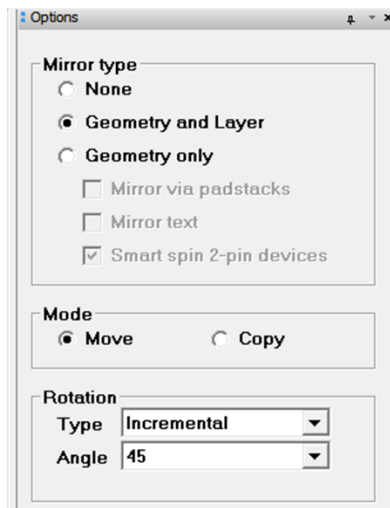

Figure 1: Advanced Mirror

The application can be started from Pulldown Menu or by entering the command `tbx advmirror` in the console window.

2 Use model

The command options are available from *Options panel*

Figure 2: Options panel

The use model is as follows:

- Select elements for operation by dragging a window or by single pick. Adjust *Find Filter* if necessary. Furthermore *RMB – Temp Group* is available.

- Pick coordinate that acts as selection origin. The selected elements appear as dynamic graphics attached to cursor.

- Choose the appropriate mirror type by selecting one of the radio buttons. Alternatively you can also use the context menu:

    – *Geometry and Layer*
      Mirror will be performed in x-direction (along y axis) and across subclasses. For example if object is on ETCH/TOP it will be mirrored both in x and to layer ETCH/BOTTOM.

    – *Geometry only*
      Mirror will be performed in x-direction (along y axis) but the object remains on its subclass

    – No mirror
      The selected objects will not be mirrored

- You may also use *RMB – Rotate* to spin the selected group of objects

The dynamic graphics attached to cursor directly reflect the current mirror and rotation settings.

- Pick destination coordinate. The operation will be performed for the selected elements.

- Command is still active. Select other objects to continue. You may use *RMB – Oops* for undo operation.

- Use *RMB – Done* to commit the changes

3 Notes

3.1 Via padstack handling

When *Geometry only* is active there is an option *Mirror via padstacks*. If checked the via pad geometry is mirrored on the same layer. If unchecked only the xy coordinate of the via (and rotation if user has chosen *RMB – Rotate*) will be transformed but the pad geometry itself remains unchanged. In most cases you will not see any difference, since via pads are usually symmetrical. However, the following figures show the difference for vias where the pad boundary had been modified.
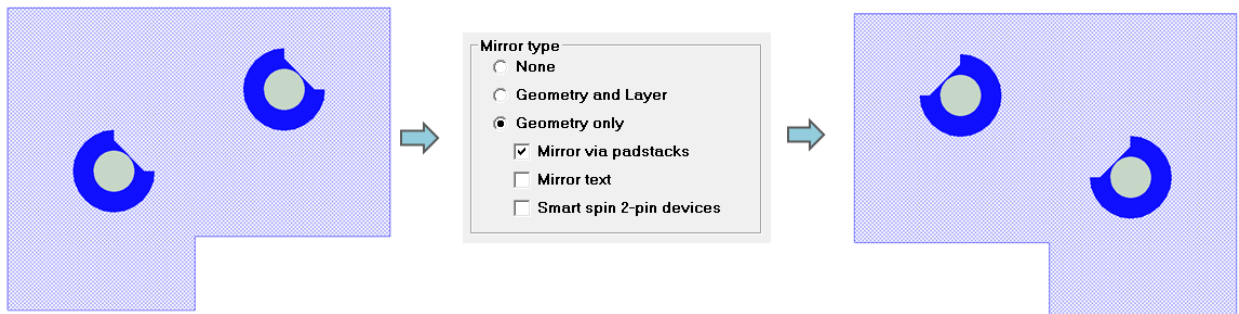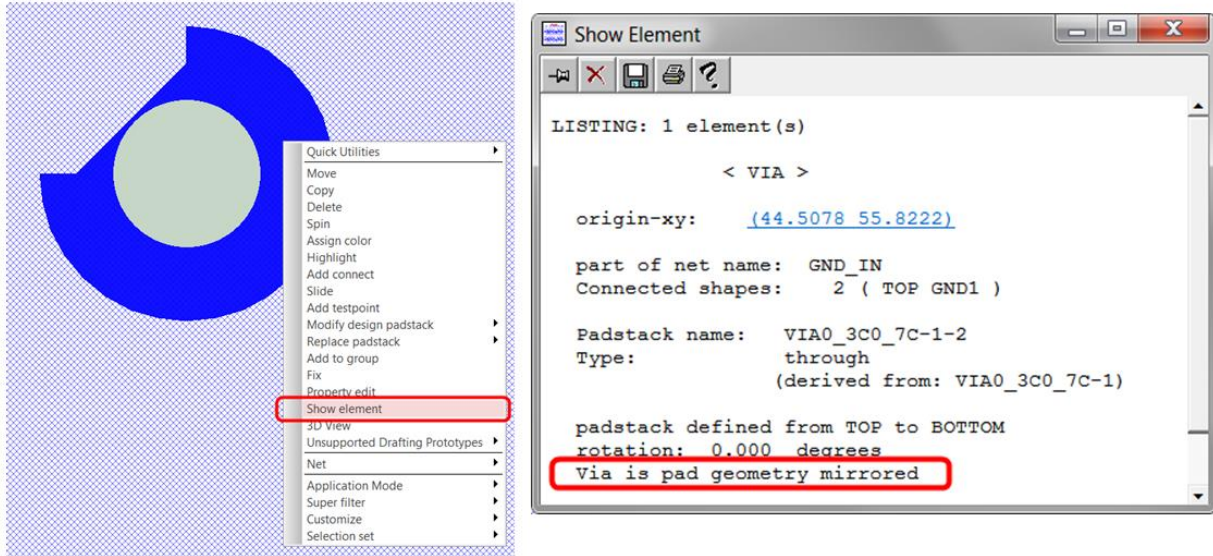
Figure 3: Enable via padstack mirror

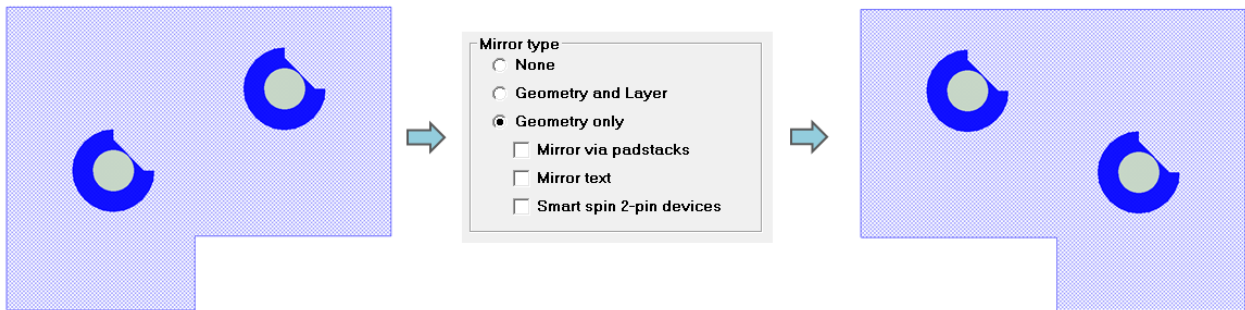**Figure 4: Via padstack mirror report**

Figure 5: Disable via padstack mirror

3.2 Text handling

When *Geometry only* is active there is an option *Mirror text*. If checked texts will be mirrored in a similar way like other elements, readability might suffer. If unchecked only the xy coordinate of the text (and rotation if user has chosen *RMB – Rotate*) will be transformed but the text remains in its original state, so that readability is still ensured.
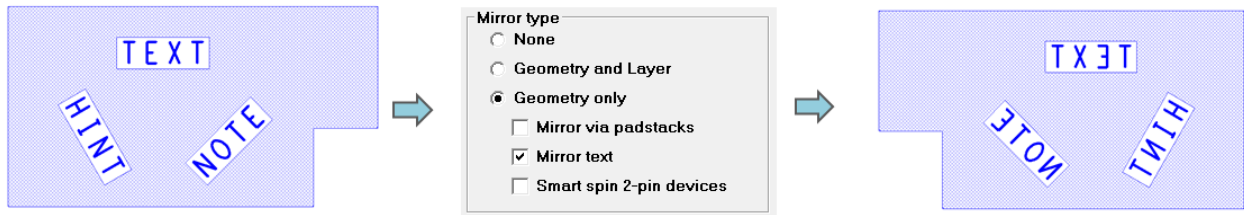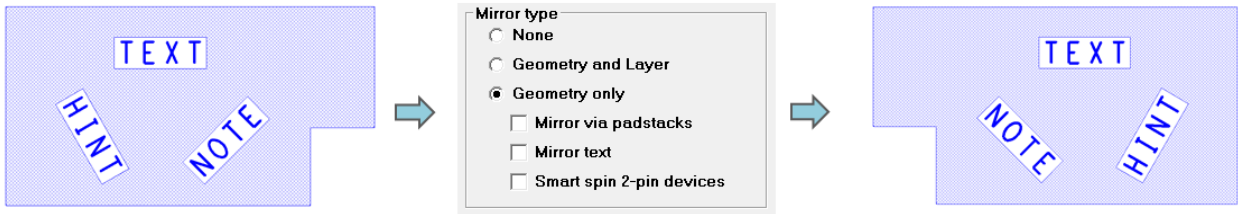

Figure 6: Enable text mirror

Figure 7: Disable text mirror

3.3 Symbol handling

When *Geometry only* mode is used symbols will be treated separately, since a true symbol geometry mirror on the same layer is not possible. In this case transformation will be applied only to the xy coordinate of the symbol (and the rotation if user has chosen *RMB – Rotate*). Additional DRC may occur which need to be fixed by the user. A popup confirmer appears in order to inform the user.
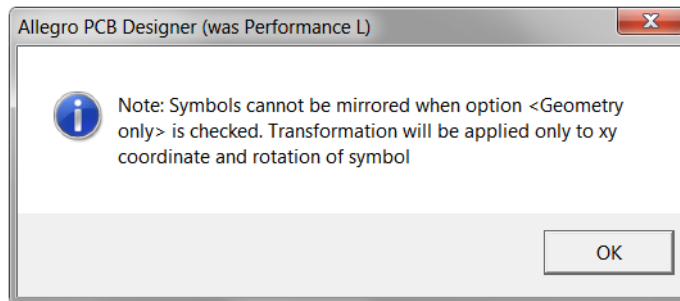

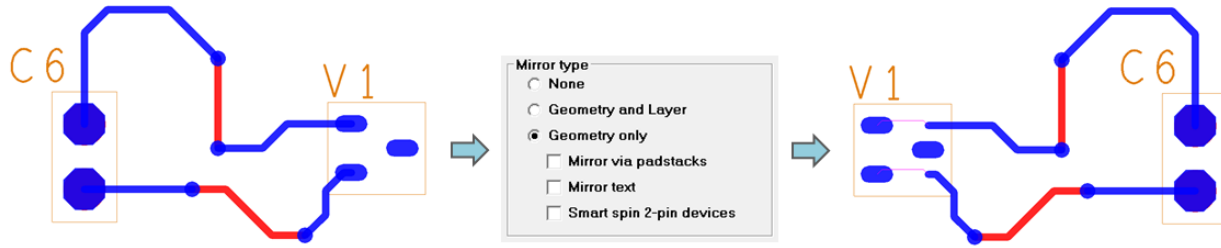**Figure 8: Popup confirmer when mirroring symbols on same layer**

Figure 9: Geometry only mode, symbol handling

There is an option *Smart spin 2-pin devices*. When checked symbols with two electrical pins will be span around its axis for proper alignment with mirrored geometry of lines, clines and shapes. Refer to the following example. A circuit will be mirrored on the same layer. When option *Smart spin 2-pin devices* is checked, the rotation of resistors R1 to R4 will be adjusted after mirror. R1 will be rotated by 180 degrees, R2 and R3 will be rotated accordingly. R4 remains unchanged. For other components only xy coordinate of symbol origin has been mirrored. Of course DRC's might occur in the end, which have to fixed by user.
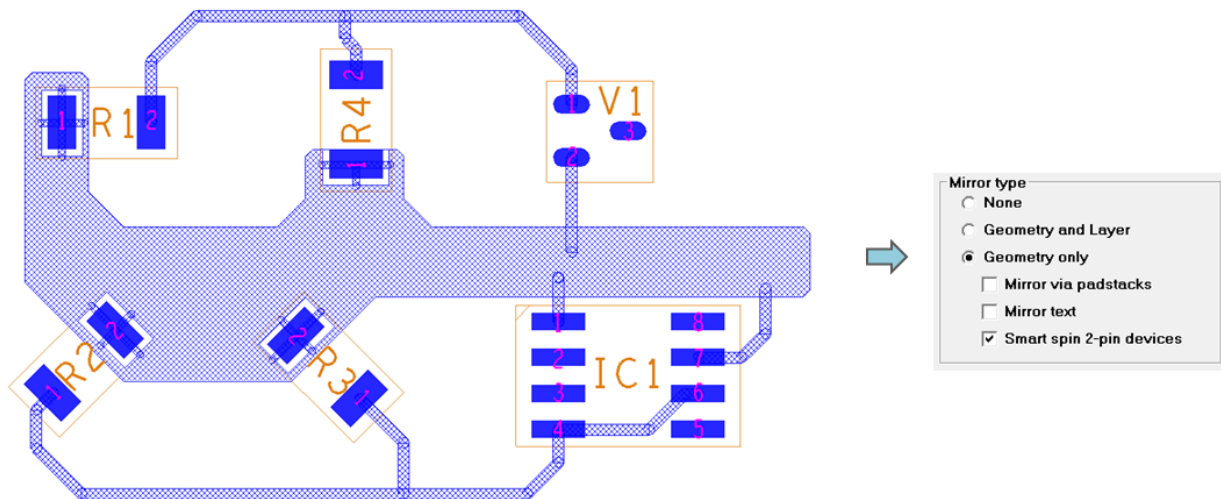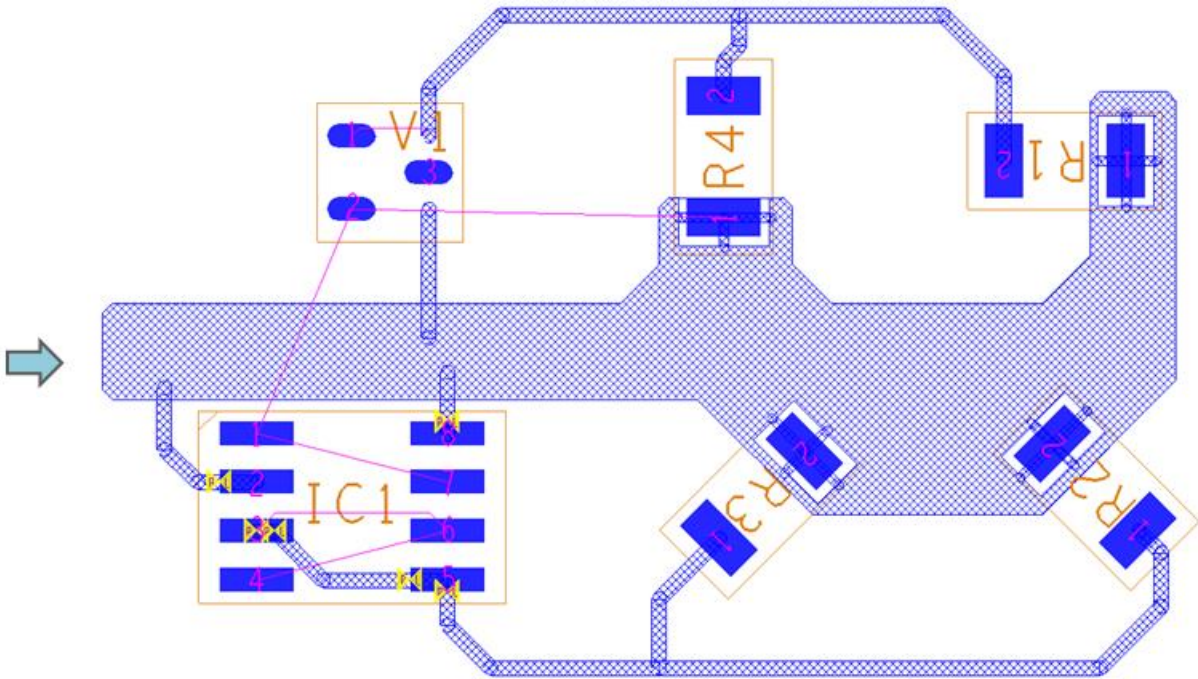

Figure 10: Circuit mirror with Smart spin enabled, original ciruit

Figure 11: Circuit mirror with Smart spin enabled, result