

Track Pattern Task Assistant

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Getting Started with the Track Pattern Assistant

The Track Pattern assistant acts as a guidance method to capture design rules and design intent for creating wires and it is displayed as tracks on the canvas. It lets you choose the width spacing patterns that apply across the entire cellview, referred to as global area, or in a specific local area.

You can use this assistant to enable the predefined WSSPDefs for the global grid and choose the active pattern and optional wire type for enabled WSSPDefs from the allowed patterns. By default global regions are created using the Track Pattern assistant. You can also create local regions using the Track Pattern assistant.

The following sections provide details on how you can use the Track Pattern assistant to perform various tasks:

- [How do I control the visibility of track patterns?](#)
- [How do I selectively view track patterns in the TPA table?](#)
- [How do I use a different WSP in a specific area?](#)
- [How do I create a local track pattern region?](#)
- [How do I edit a local track pattern region?](#)
- [Glossary](#)
- [Virtuoso Width Spacing Patterns User Guide](#) 

Glossary

This section lists the commonly used terms with respect to the Track Pattern assistant:

RSP: Related Snap Pattern. It is a group of snap patterns and width spacing patterns used for creating local regions.

SP: Snap Pattern. These are regular stepped patterns use for guiding the base layer snapping.

TPA: Track Pattern Assistant

WSP: Width Spacing Patterns. These are the variable width and spacing patterns.

WSSPDef : Width Spacing Snap Pattern Definition. This is a container to associate a width spacing pattern with a direction and layer.

Related Topics

- [Getting Started with the Track Pattern Assistant](#)

How do I align WSPs across hierarchy?

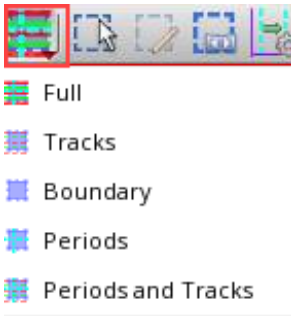
By default, WSPs are active only at the current level of hierarchy. You can use the pull up icons on the Track Pattern assistant toolbar to pull up WSP from lower level cells as local regions.

To pull up the WSSPDefs for a single subcell or all instances of an instance master:

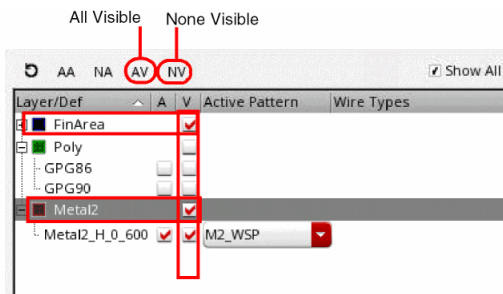
1. Select an instance that has WSSPDefs in the layout.
2. Click one of the following icons:
 - *Pull Up One*: To pull up only the selected instance.
 - *Pull Up All*: To pull up all the instances of an instance master.
 - *Pull Up WSPs For Layers*: To pull up all instances of a layer. You can select the layers to be used to pull up the WSPs.

How do I control the visibility of track patterns?

You can control the visibility of track patterns using the *Display Mode* icon on the Track Pattern assistant toolbar. This option lets you control the display of boundaries and track elements on the canvas. You can choose to view the local region boundaries, period lines, track lines, or full track widths.



Once you select the display mode, you can decide which specific layer's track patterns are visible on the canvas. You select this by clicking the V (Visibility) column header or the individual check boxes by layer. You also use the AV (All Visible) and NV (None Visible) buttons at the top of the Track Pattern table to control the visibility of all layers at once.



In addition, even if a WSP is not visible but it is active, the Wire Editor dynamically makes the relevant tracks visible. You can disable the Wire Editor dynamic display of tracks by setting the environment variable, *dynamicDisplayEnabled*.


```
envSetVal("we" "dynamicDisplayEnabled" 'boolean nil)
```

Related Topics

- [Getting Started with the Track Pattern Assistant](#)

How do I create a local track pattern region?

To create a local track pattern region, follow the steps:

1. Click the *Create Region* icon  on the Track Pattern assistant toolbar to open the Create Region form.
2. Choose one of the following in the Related Snap Patterns list:
 - Asterisk (*): Shows all the defined WSSPDefs in the Snap Pattern Defs list.
 - A related snap pattern group name: Shows only the WSSPDefs for the selected related

snap pattern group in the Snap Pattern Defs list.

- Row template: The row templates are stored so that you can select a related snap pattern with row templates instead of individual elements.

4. Choose one or more WSSPDefs in the Snap Pattern Defs list.

5. Specify a name for the local track pattern region in the *Name* field.

Related Topics

- [What are the available creation modes for local track patterns?](#)

How do I create a track pattern in Draw Area mode?

You can specify the area of the track pattern region by specifying the following options on the *Draw Area* tab.

1. Select *Auto Complete Region* check box.
2. Specify an appropriate number in the *No. of X periods* and *No. of Y periods* fields.
3. Specify values in the *Snapping* section to derive the track pattern region snapping values. In this section, specify or select:
 - *Multiplier*: You can specify a multiplier for *X* and *Y* fields. The multiplier can be an integer, float, or fraction.
 - *Snapping Options*: You can select the region snapping values from the following list of options:
 - max pitch: The pitch with the largest value of the selected WSSPDefs in horizontal or vertical direction.
 - manufacturing grid: The value specified in the manufacturing grid.
 - user units: One user unit. For the RSP that you select in the Create Region form, if the regionSnapPitchVertical and regionSnapPitchHorizontal values are specified in the relatedSnapPatterns in the technology database, these values are used as the user unit values for snapping the RSP.
 - window snap: This is the value specified in the X Snap Spacing and Y Snap Spacing values in the Display Options form.
 - predefined value: A value predefined for a WSP.

4. View the X/Y calculated values: The X and Y snapping values calculated based on options specified above are displayed after the equal to sign in the *Snapping* section.

Related Topics

- [What are the available creation modes for local track patterns?](#)
- [How do I create a track pattern in the Specify Area mode?](#)
- [How do I create track patterns in Boundary Area mode?](#)

How do I create a track pattern in the Specify Area mode?

You can specify the area of the track pattern region by specifying the following options on the *Specify Area* tab.

1. Specify the *X Origin* and *Y Origin* for the track pattern region.
2. Specify the *Width*, and *Height* for the track pattern region.
3. Specify values in the *Snapping* section to derive the track pattern region snapping values. In this section, specify or select:
 - *Multiplier*: You can specify a multiplier for *X* and *Y* fields. The multiplier can be an integer, float, or fraction.
 - *Snapping Options*: You can select the region snapping values from the following list of options:
 - max pitch: The pitch with the largest value of the selected WSSPDefs in horizontal or vertical direction.
 - manufacturing grid: The value specified in the manufacturing grid.
 - user units: For the RSP that you select in the Create Region form, if the regionSnapPitchVertical and regionSnapPitchHorizontal values are specified in the relatedSnapPatterns in the technology database, these values are used as the user unit values for snapping the RSP.

- window snap: This is the values specified in the X Snap Spacing and Y Snap Spacing fields in the Display Options form.
- predefined value: A value predefined for a WSP.

4. View the X/Y calculated values: The X and Y snapping values calculated based on options specified above are displayed after the equal to sign in the *Snapping* section.

Related Topics

- [What are the available creation modes for local track patterns?](#)
- [How do I create a track pattern in Draw Area mode?](#)
- [How do I create track patterns in Boundary Area mode?](#)

How do I create track patterns in Boundary Area mode?

You can specify the boundary area, PR boundary, or area boundary of the track pattern region by specifying the options on the *Boundary Area* tab.

1. Select the boundary, PR boundary or area boundary, from the *Boundary* drop-down list box.
2. Specify the boundary identification details in the *Layer Pattern* and *Purpose* fields. You can use the wildcard characters * or ? for matching the layer name.

The default value for the Purpose field is *id*. You can also specify a string that represents a purpose in this field.

When you specify the layer and purpose, all shapes on matching LPPs are added to the *Boundary* drop-down list box.

Related Topics

- [What are the available creation modes for local track patterns?](#)
- [How do I create a track pattern in Draw Area mode?](#)
- [How do I create a track pattern in the Specify Area mode?](#)

What are the available creation modes for local track patterns?

You can choose from one of the following track pattern creation options:

- **Draw Area:** You can draw the area of the track pattern region by specifying the options on the *Draw Area* tab.
- **Specify Area:** You can specify the area of the track pattern region by specifying the options on the *Specify Area* tab.
- **Boundary Area:** You can specify the boundary area, PR boundary, or area boundary of the track pattern region by specifying the options on the *Boundary Area* tab.

Related Topics

- [How do I create a track pattern in Draw Area mode?](#)
- [How do I create a track pattern in the Specify Area mode?](#)
- [How do I create track patterns in Boundary Area mode?](#)

How do I edit a local track pattern region?

You can edit the content of a local track pattern region using the *Edit WSP Regions* command. You can also edit the area of a local track pattern region using the *Stretch Region* command.


The following sections describe the options related to editing a local track pattern region:

- [How do I edit the content of a local track pattern region?](#)
- [How do I edit the area of a local track pattern region?](#)
- [How do I flip track patterns?](#)

How do I edit the content of a local track pattern region?

To edit a track pattern region, follow the steps:

1. Select one or more regions on the canvas


1. Select one or more regions on the canvas.
2. Click the *Edit Region* icon  on the Track Pattern assistant toolbar.
3. The current region index and number of regions are shown at the top of the form with the WSSPDef and period for the current region. Each region group will be represented by a region for each of its layers. For example, a region group comprising three layers will be represented by three regions, one for each of the three layers. Use the left and right arrows at the upper-left corner of the form to scroll between the regions.
4. Choose the *Allowed Pattern Groups*, *Allowed Patterns*, the *Active Pattern*, and *Wire Types* in the respective lists for the region.

Related Topics

- [How do I edit the area of a local track pattern region?](#)
- [How do I flip track patterns?](#)

How do I edit the area of a local track pattern region?

You can edit the area of a local track pattern region using the *Stretch Region* command. To stretch a local track pattern region, follow the steps:

1. Click the *Stretch Region* icon  on the toolbar in the Track Pattern assistant. Press *F3* to open the Stretch Region form.
2. Select the *Auto Increment Region* check box to enable the *No. of X periods* and *No. of Y periods* fields. The track pattern region is stretched based on these values.
3. Specify values in the *Snapping* section to derive the track pattern region snapping values. In this section, specify or select:
 - *Multiplier*: You can specify a multiplier for *X* and *Y* fields. The multiplier can be an integer, float, or fraction.
 - *Snapping Options*: You can select the region snapping values from the following list of options:
 - max pitch: The pitch with the largest value of the selected WSSPDefs in horizontal or vertical direction.
 - manufacturing grid: The value specified in the manufacturing grid.
 - user units: One user unit. For the RSP that you select in the Create Region form, if

the regionSnapPitchVertical and regionSnapPitchHorizontal values are specified in the

- relatedSnapPatterns in the technology database, these values are used as the user unit values for snapping the RSP.
- window snap: These are the values specified in the X Snap Spacing and Y Snap Spacing fields in the Display Options form.
- predefined value: A value predefined for a WSP.

4. View the X/Y calculated values: The X and Y snapping values calculated based on options specified above are displayed after the equal to sign in the *Snapping* section.

The track pattern region is stretched based on the values specified on the Stretch Region form.

Note: The stretch region snaps to local WSSPDef region boundaries if one of the LPPs that identifies the WSSPDef region in the figGroup is visible. If the LPPs are all non-visible, the stretch region only stretches if the pointer is clicked directly on the edge of the figGroup.

Related Topics

- [How do I edit the content of a local track pattern region?](#)
- [How do I flip track patterns?](#)

How do I flip track patterns?

To view or change the repeat mode for a pattern in the region, follow the steps:

1. Click the *Flip Options* button.
2. The Pattern Flipping form appears.

The default repeat mode for a WSSPDef in the region is the first table entry for the WSSPDef with Pattern *All*.

All patterns in the WSSPDef have the same repeat mode unless you change individual settings in the *Repeat Mode* column.
3. In the *Repeat Mode* column, choose the default repeat mode or individual pattern repeat modes for the region as one of the following:
 - Stepped: The pattern is the same in every period.
 - Flipped Odd: The pattern is flipped in every other period. The first period is not flipped.
 - Flipped Even: The pattern is flipped in every other period. The first period is flipped.

- Unset: Restores the value to the global grid repeat mode for a WSSPDef, or to the default for the WSSPDef if you are unsetting an individual pattern

4. Click OK or Apply to set the changes.

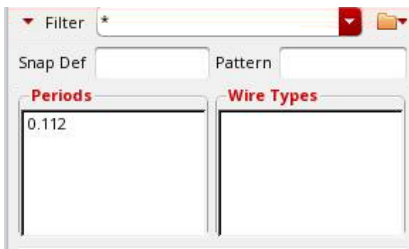
Related Topics

- [How do I edit the content of a local track pattern region?](#)
- [How do I edit the area of a local track pattern region?](#)

How do I selectively view track patterns in the TPA table?

There are several ways to filter the WSSPDefs and SPDefs that are shown in the Track Pattern table. This only affects the Track Pattern table and not what is displayed in the layout canvas.

Use the progressive disclosure for the *Filter* section to expand it. You can use this section on the Track Pattern assistant to selectively view track patterns in the design.



The filters (Snap Def, Pattern, Periods, and Wire Types) are evaluated dynamically to customize the table, in order of the following precedence from highest to lowest:

- [Filtering by Snap Defs](#)
- [Filtering by Pattern](#)
- [Filtering by Periods](#)
- [Filtering by Wire Types](#)

When applying a filter, it does not change what is active for the Wire Editor. It just applies the filter to reduce which WSSPDefs and SPDefs are displayed in the Tracks Patterns table.

Related Topics

- [Getting Started with the Track Pattern Assistant](#)

How do I filter by pattern?

To show only WSSPDefs with allowed WSPs matching an expression, type the expression in the *Pattern* field.

As you type, the WSSPDefs in the *Layer/Def* column of the table is dynamically updated to include only those matching the expression. Expressions are case-sensitive and can include the special characters shown in the table below:

Special Characters	Meaning
?	Matches any single character.
*	Matches any sequence of zero or more characters.
[chars]	Matches any single character in chars. If chars contains a sequence of the form a-x, then any character between a and x (inclusively) will match.
{a, b,...}	Matches any of the strings a, b, ... listed within the braces.

Related Topics

- [How do I selectively view track patterns in the TPA table?](#)

How do I filter by periods?

If the *Show All* check box is selected, the *Periods* filter list box displays the periods for the enabled WSSPDefs in the Track Pattern table. Otherwise, only the periods for the enabled WSSPDefs are displayed.

To show only WSSPDefs with a specific period:

- Click the period in the *Periods* list box.

The period is selected. Only WSSPDefs with a period matching a selected period are displayed in the Track Pattern table. Multiple periods can be selected.

To deselect a period:

- Click the period.

The filter is removed for the period.

Related Topics

- [How do I selectively view track patterns in the TPA table?](#)

How do I filter by snap defs?

To show only WSSPDefs and SPDefs matching an expression, type the expression in the *Snap Def* field.

As you type, the WSSPDefs and SPDefs in the *Layer/Def* column of the table is dynamically updated to include only those matching the expression. Expressions are case-sensitive and can include the special characters shown in the table below:

Special Characters	Meaning
?	Matches any single character.
*	Matches any sequence of zero or more characters.
[chars]	Matches any single character in chars. If chars contains a sequence of the form a-x, then any character between a and x (inclusively) will match.
{a, b,...}	Matches any of the strings a, b, ... listed within the braces.

Related Topics

- [How do I selectively view track patterns in the TPA table?](#)

How do I filter by wire types?

To show only WSSPDefs with an active WSP containing a pattern of a specific wire type:

- Click the wire type in the *Wire Types* list box.

The wire type is selected. WSSPDefs with an active WSP containing a pattern of a wire type matching a highlighted wire type will be shown in the Track Pattern table. Multiple wire types can be selected.

To deselect a wire type:

- Click the wire type.

The filter is removed for the wire type.

Related Topics

- [How do I selectively view track patterns in the TPA table?](#)

How do I use a different WSP in a specific area?

You can use the Track Pattern assistant to set track patterns in a specific area that is different than the rest of the design. This is also referred to as the local region.

You can use the Track Pattern assistant to decide the WSP that you want for the local region. Then, guide where it goes in the cellview. The local region that you create gets placed as a figGroup. You can specify a custom name to it. Whenever this figGroup is selected, the Track Pattern assistant reflects the WSPs that were selected for it. When you create a local region, you have already decided the WSPs that will be included for the local region, you cannot actively select WSPs in the local region. The local region overrides the global region for just the layers selected in the Track Pattern assistant for the local region. Layers that are not part of the local region but active globally will still be active within the local region area.

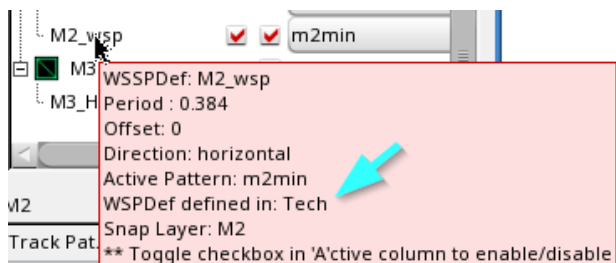
Related Topics

- [What are the available creation modes for local track patterns?](#)
- [How do I create a local track pattern region?](#)
- [How do I edit a local track pattern region?](#)

Where are WSPs defined?

WSPs are defined in the technology file or in the design. To check where a WSP is defined, hover over the WSPDef in the Track Patterns table, and observe the details.

- WSPDef defined in the technology file



- WSPDef defined in the design

Track Pattern Task Assistant

Getting Started with the Track Pattern Assistant--How do I use a different WSP in a specific area?

