PatternCAD™

PatternCAD is a very powerful tool that allows you to create patterns. From simple line patterns to complex designs with multiple sections. There are numerous options to help you achieve the results you are looking for. There are different tools within the application that enable you to create a wide variety of patterns. This guide will break down the different sections first, then cover each section in depth and how they can be applied.
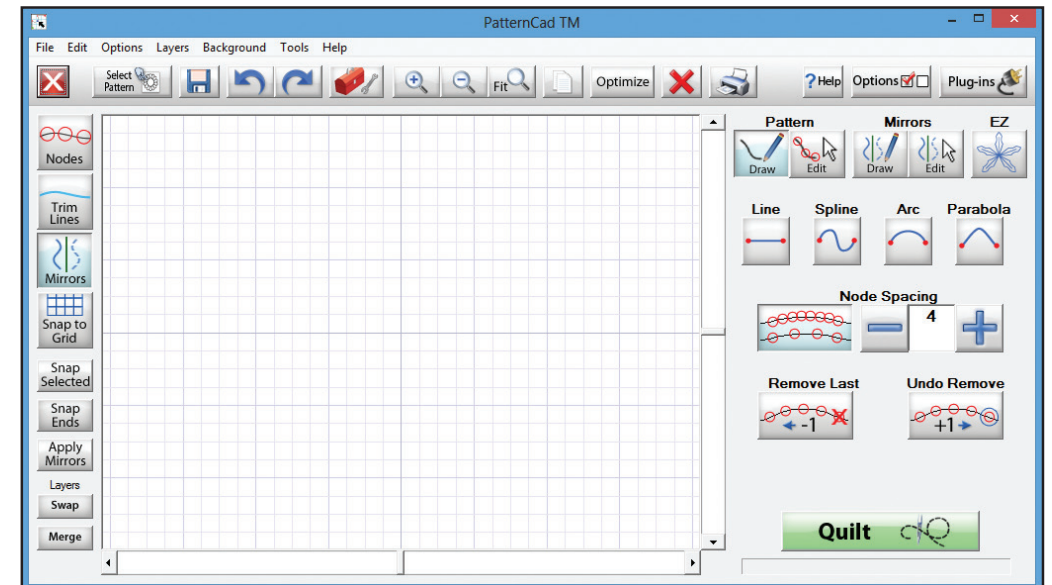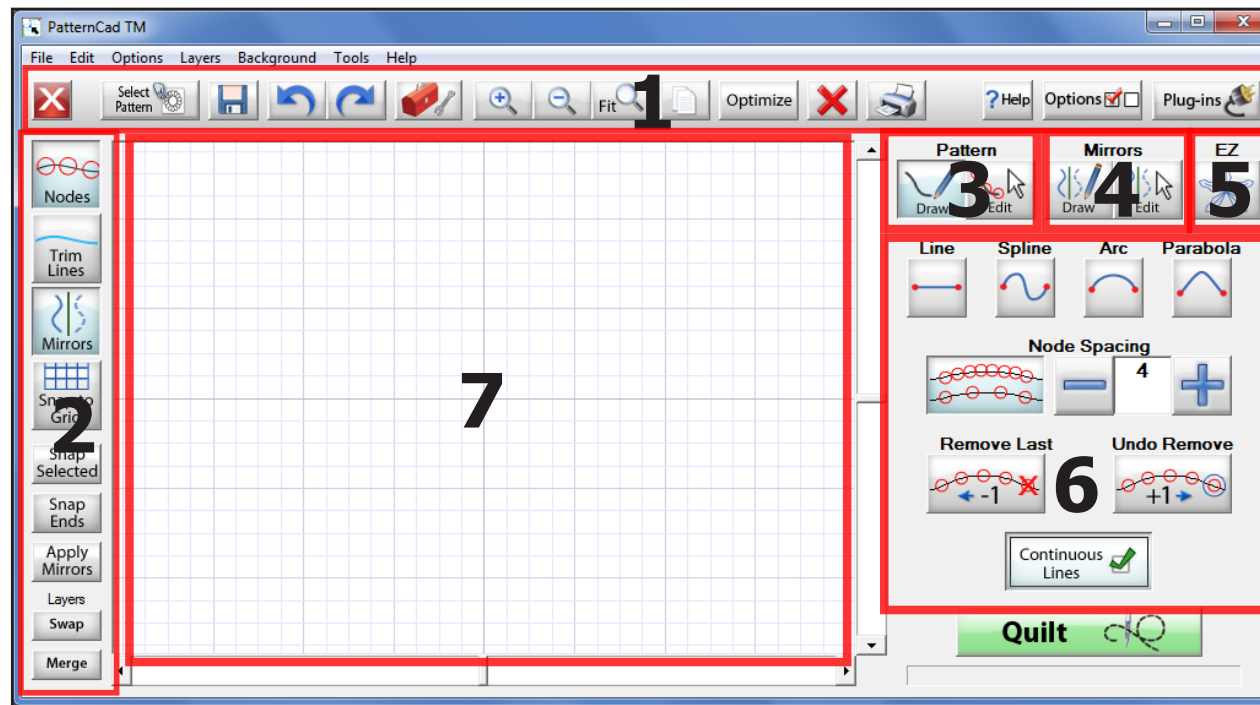
PatternCAD™

Contents

Design & Create
New Pattern

Within the software is PatternCAD. This portion of the software allows you to create your very own patterns that you can place onto your quilt. There is no limit on what you want to create!

We will cover each option and what it is capable of. To access PatternCAD tap the Pattern button under Design and Create.

1. **Tool Bar** — A quick way to access functions you may use often; Save, Undo, Re-do, Zoom in, Zoom out, etc.....

2. **View and Node options Quick Menu** — This menu allows you to show or hide trim lines, nodes, and mirrors.

3. **Pattern Tools** — The pattern tools are what allows you to choose the type of line you wish to make. It also allows you to edit patterns already created.

4. **Mirror Tools** — The mirror tool is used to create items that may repeat such as a snowflake, using this you can make an 8 sided pattern by only creating one section.

5. **EZ Pattern** — This option allows you to load preset design schemes, and from there you can add what ever you prefer and change the presets.

6. **Current Tool Menu Area** — This area will display the functions of the Pattern Tools, Mirror Tools, and EZ pattern tools.

7. **Drawing Plane** — This is the working area of the pattern, this is where all the magic happens!
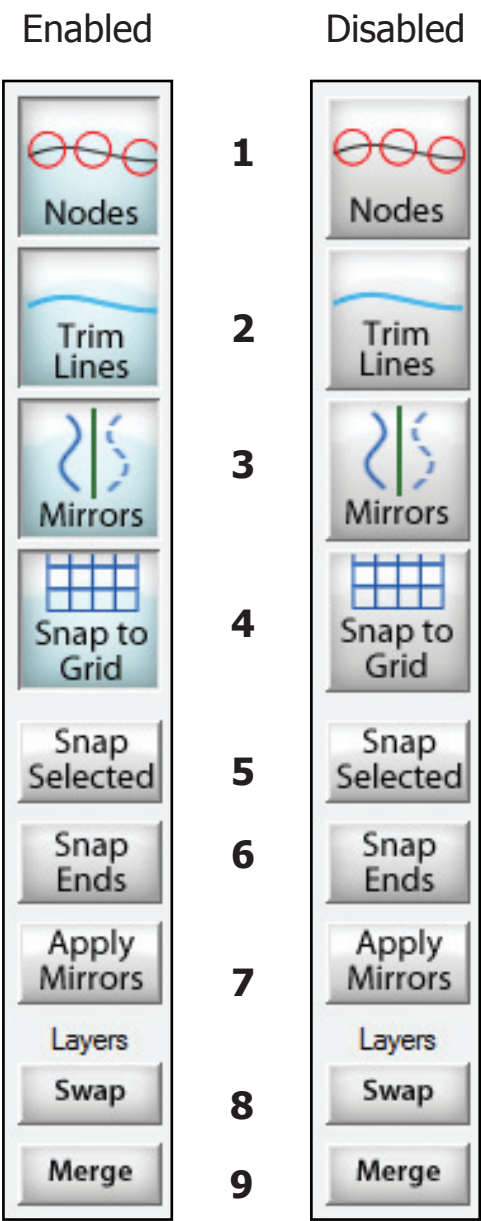
Tool Bar

1 **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15** **16**
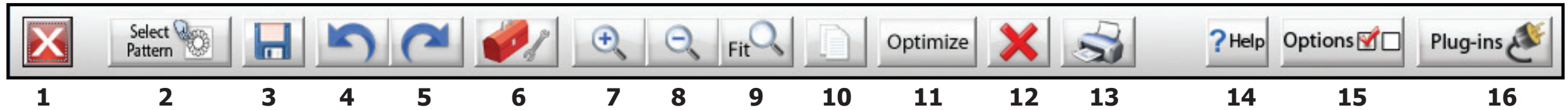
1. **Exit** — Exits PatternCAD.

2. **Select Pattern** — Opens the Pattern Selection window.

3. **Save** — Saves your current pattern.

4. **Undo** — Removes last action performed.

5. **Re-do** — Replaces the action of an Undo.

6. **Tool Box** — Opens menu for layers, background, and templates.

7. **Zoom In** — Zooms in on the Pattern Grid.

8. **Zoom Out** — Zooms out of the Pattern Grid.

9. **Zoom Fit** — Will Zoom into the current items selected.

10. **Copy Selected** — Copies and Pastes the selected nodes.

11. **Optimize** — Opens the Optimization screen.

12. **Delete All** — Deletes all nodes on the screen.

13. **Print** — Allows you to print the pattern.

14. **Help** — This menu allows you to access this help file, and see detailed information about the application.

15. **Options** — Access to the Preferences Menu

16. **Plug-ins** — Access the plug-ins menu, allowing you to export or import patterns and more!

View and Node Options

The tools on the left are more geared towards how you see the pattern and how the pattern grid reacts to your input.

Node = a basic unit used to build data, a point on a grid or graph.

1. **Nodes Enabled** — Displays pattern nodes.

2. **Trim Lines Enabled** — Displays all trim lines for the pattern.

3. **Mirrors Enabled** — Displays Mirrors on the pattern.

4. **Snap to Grid Enabled** — When you draw a line, the nodes will snap to the pattern grid.

5. **Snap selected** — This option connects 2 nodes so they become part of a continuous line.

6. **Snap Ends** — Connects the starting node to the ending node.

7. **Apply Mirrors** — This will make the Mirrored nodes permanent.

8. **Swap** — Switches between the layers of the pattern.

9. **Merge** — Merges the layers, only 2 layers are available.

Enabled   Disabled

Nodes	1	Nodes
Trim Lines	2	Trim Lines
Mirrors	3	Mirrors
Snap to Grid	4	Snap to Grid
Snap Selected	5	Snap Selected
Snap Ends	6	Snap Ends
Apply Mirrors	7	Apply Mirrors
Layers		Layers
Swap	8	Swap
Merge	9	Merge

Menu Bar

File

The file menu is mostly used to open a new file, and existing file and save the file.

- **New**
Opens a blank template to create a new pattern.
- **Open Pattern (Auto Center)**
Open an existing pattern file and center it on the working space.
- **Open Pattern (As Is)**
Opens a Pattern without changing the orientation.
- **Open Mirror**
Opens a saved mirror layout.
- **Save Mirror**
Saves mirror settings for future use.
- **Print**
Opens the print Menu.

```
New
Open Pattern (Auto Center)
Open Pattern (as is)
Save Pattern
Open Mirror
Save Mirror
Print
Flatten Pattern
Copyright the Pattern
Exit
```

- **Flatten Pattern**
Applies all layers of the image onto one layer.
- **Copyright Pattern**
Copyright your pattern, ake credit for your work!
- **Exit**
Exit the application.

Edit

The edit menu is used to Undo or Redo an action, Select different layers of the pattern, Rest the patterns and access the Preferences menu.

- **Undo**
Undo the last action, you can undo to your first action.
- **Redo**
Re applies an action if the Undo feature is used.
- **Select All**
Selects all items in PatternCAD.
- **Select All (Pattern)**
Selects only the Pattern Nodes.
- **Select All (Mirror)**
Selects only the Mirror Nodes.
- **Unselect All**
Deselects all nodes.
- **Clear Patter**
Removes pattern nodes.

```
Undo            Ctrl+Z
Redo            Ctrl+Y
Select All
Select All (Pattern)
Select All (Mirrors)
Unselect All
Clear Pattern
Clear Mirrors
Clear Bottom Layer
Preferences
```

- **Clear Mirrors**
Removes all mirror nodes.
- **Clear Bottom Layer**
Removes the unselected Layer.
- **Preferences**
Opens the Preferences Menu.

Menu Bar continued

Options

The options menu shows you the current line type you are using, represent by the check mark. It also allows you to choose a different line type to draw with.

- **Draw Lines**

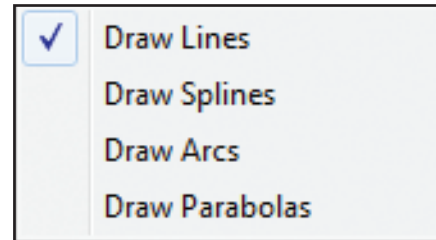Sets the Draw tool to Lines.
- **Draw Splines**

Sets the Draw tool to Splines.
- **Draw Arcs**

Sets the Draw tool to Arcs.
- **Draw Parabolas**

Sets the Draw tool to Parabolas.

√ Draw Lines
Draw Splines
Draw Arcs
Draw Parabolas

Copy to Bottom Layer
Swap Layers
Merge Bottom to Top
Merge Top to Bottom

Layers

There are 3 types of layers in PatternCAD; Top Layer, Bottom Layer, and the Mirror Layer.

The Bottom Layer is the same as Top Layer, but any changes you make to the Bottom Layer will not effect The Top Layer. And the same applies if you make changes to the Top Layer, the Bottom Layer will not be effected. The Bottom Layer is the default Layer.

The Mirror Layer shows the mirror and the lines it will duplicate, but they are not applied to the pattern file until you select Apply Mirrors. Also mirrors will only be applied to the layer that is currently active.

- **Copy to Bottom Layer**

Copies the selected items on the Top Layer and applies them to the Bottom Layer.
- **Swap Layer**

Switches between the two Layers.
- **Merge Bottom to Top**

Merges items from the Bottom and applies them to the Top.
- **Merge Top to Bottom**

Merges items from the Top and applies them to the Bottom.

Menu Bar continued

File   Edit   Options   Layers   Background   Tools   Help

Background

The background menu allows you to apply a specific image or grid to the PatternCAD drawing plane.

- **Clear**

Removes the Grid and any loaded Image.

- **Grid**

Places or removes the grid on the drawing plane.

- **Load Image**

When this option is selected you are able to browse your computer and load jpg image or bitmap as the background. Once its loaded you can trace the image.

- **Fade**

Applies a fade to the background image. This works best if you are having a hard time seeing the image and your lines.

- **Grey Scale**

Changes the background image to grey scale. All color is removed.

- **Invert**

Inverts the color of the background image. Sometimes that can be useful when the image is hard to see.

Clear	
Grid	
Load Image	
Fade	Ctrl+F
Gray Scale (BW)	Ctrl+G
Invert	Ctrl+I

Tools

The tools menu allows you to access three pre made templates to create patterns with. You can also move the start and end point of a pattern.

| Triangle Template 1 |
| Triangle Template 2 |
| Triangle Template 3 |
| Move Start Point |
| End Point Continuity |

- **Triangle Template**

Places a triangle on the Top Layer, this can be used as a border for a pattern.

- **Triangle Template 2**

Places a triangle on the Top Layer with a single line, double sided mirror. Great for creating Triangle patterns.

- **Triangle Template 3**

Places a Triangle on the Top Layer, and a two line double sided mirror with the triangle. Perfect template for creating On Point Block Patterns.

- **Move Start Point**

Select any Node, and choose this option. The start point will be moved to the selected Node.

- **End Point Continuity**

This option will bring up two mirrors, one on each side of the pattern. One at the start point, and one at the End Point. It will then show you the pattern as if it was in a row. This option will be used when you want to make sure the point of your pattern line up.

PatternCAD - Right Click Menu

You can right click on the Drawing Plane at anytime to access this menu. From here you can quickly switch between Draw or Edit, Sketch or Mirrors. There are also options to Optimize, Undo, Redo, Select all, and much more. All of these commands can be found on the menu to the right. However there are some powerful tools here as well.

• Clear
The Clear option allows you to clear a specific element of your pattern. You can remove one of the following items and it will not clear the entire drawing plane; Pattern, Mirrors, Trace Layer, or All.

• Line Type
This option can be very useful. You can draw a Line segment and then convert it to any of the following; Line, Spline, Arc, or Parabola. To change a segment from one type to the other you must select the segment in edit then right click and choose Line Type.

• Mirror Type
Similar to the Line Type, this option gives you the ability to change one or multiple segments of a mirror to convert them into different types of mirrors; Single Sided, Alternating Flipped (there must be multiple segments in the mirror), and Double Sided. To change a mirror from one type to the other you must select the mirror in edit then right click and choose a new Mirror Type.
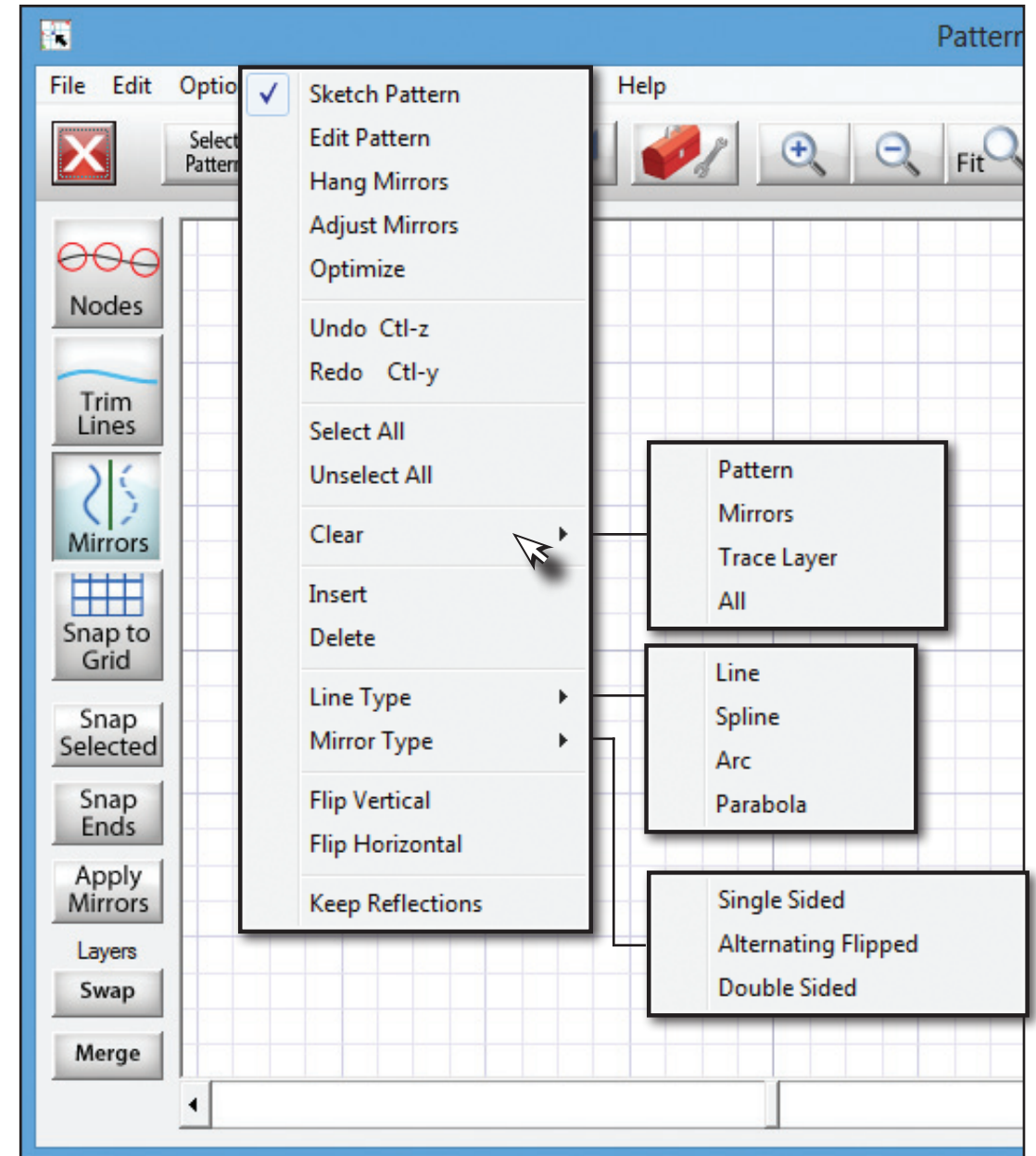
Preferences

The Preferences Menu allows you to change the colors of the different tools and block selections. To change a color just tap the color box next to the item to wish to adjust.

A couple of key items to take note on is that this preference menu has settings for the robotics, PatternCAD, QuiltCAD, PantoStacker, Printing, and the Print/Export module.

You can change the color used to represent certain object, Lines, Handles, Trim Lines.

If at anytime the settings get messed up you can always click Defaults to set the application settings for that category back to what they were when the program was installed.

There are a couple settings under PatternCAD we want to cover.

- **Continuous Line**

With this option enabled, each node that you add will be connected to the previous ones end point regardless of the line type.

This setting is ideal for creating a pattern in a continuous line without creating too many pattern segments.

- **Boost**

The Boost option enables a higher refresh rate when drawing a pattern. This mean each change you make is reflected immediately and the entire pattern is redrawn. Without it enabled the pattern is drawn one segment at a time, this is the recommended setting.
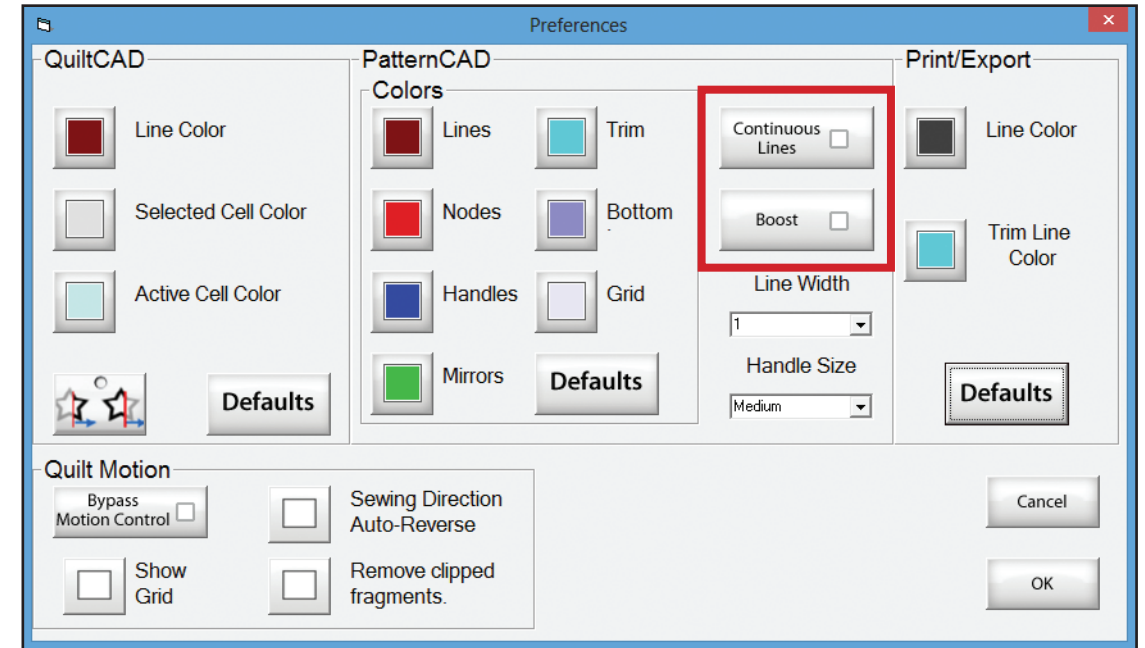
Line Width —
This setting allows you to change the width of the lines in PatternCAD. Great tool if you have such a large pattern.

Handle Size —
Change the Size of the handles, making them easier to select.

Preferences Continued

• Pattern Wrapping

Under the QuiltCAD section you will see an icon with stars in it, this is the pattern wrapping tool. When this is enabled (compressed) a pattern will wrap around one edge of the quilt and place the remaining portion of the pattern in the first block.

When this option is not turned on, the pattern will not extend back to the first block. By default, this option will be disabled.

• Bypass Motion Control

This option should only be enabled when you have installed QuiltCAD onto a computer that will not have the robotics connected to it. This way you can show the functionality of QuiltCAD without receiving errors that it cannot connect to the robotics.

• Show Grid

Turns the Grid on the placement screen on or off.

• Sewing Direction Auto Reverse

When enabled the software will try and sew the pattern selection in the most effective way, making sure it does not take unnecessary movements.

Pattern Wrap enabled   Pattern Wrap disabled
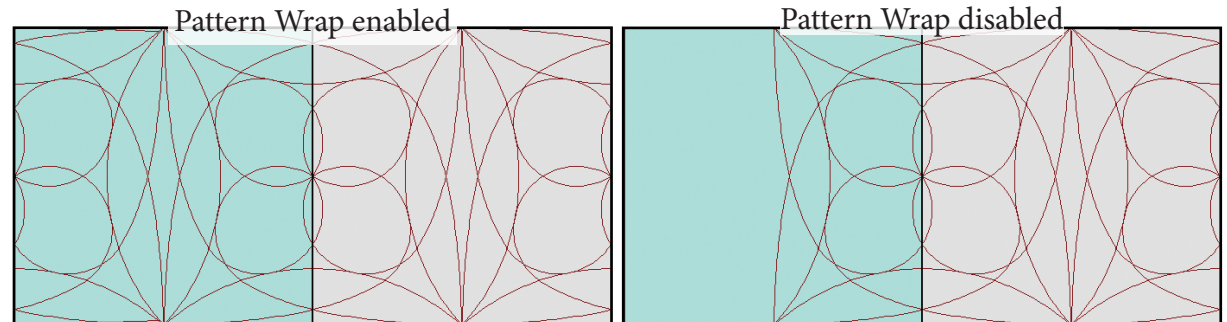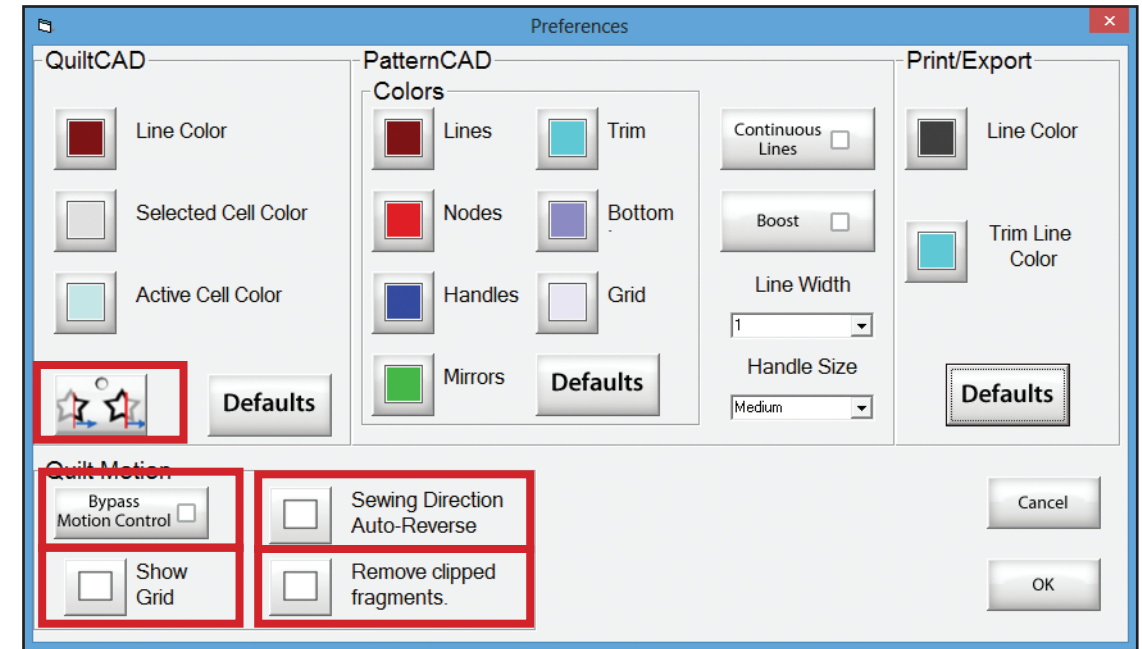
• Remove Clipped Fragments

If you have this setting enabled, and you use any pattern wrapping option the software will remove fragments that are considered too small to sew. The size of your pattern can greatly effect this setting.

Pattern Tools- Lines

The Pattern tools option is broken up into two categories; Draw and Edit.

We will cover the Draw functions first then move into editing.

PatternCAD offers some of the best ways to create patterns for all types of skill ranges, from beginners to experts. So lets get a good understanding on what they do and how they can be used!

1. **Line** — Changes the drawing type to a Line, or by Node.

2. **Spline** — Changes the drawing type to a Spline.

3. **Arc** — Changes drawing type to Arc.

4. **Parabola** — Changes drawing type to Parabola.

5. **Node Spacing On/Off** — With this option you can choose to create a line with multiple nodes. Or by two, a starting node and an ending node. The Line option is the only one that will use these settings.

6. **Node Spacing** — Sets the space between each node by using the + or -.

7. **Remove Last Node** — Removes one node, the last node placed.

8. **Undo Remove** — Replaces the node that was removed.

In order to get the Handles to appear, you must first select both ends of the segment you wish to manipulate.
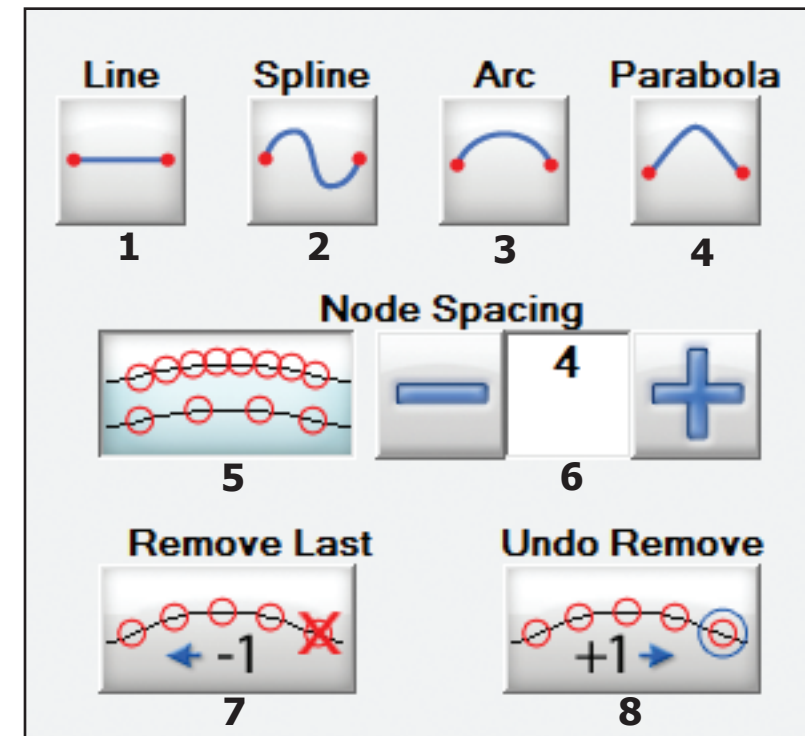
Here are some small examples of each type of line. You will notice the blue square, this is called a handle. This means the line has a point that can be moved and stretched to create the splines, arcs, and parabolas.

1 — With Node Spacing

1 — Without Node Spacing
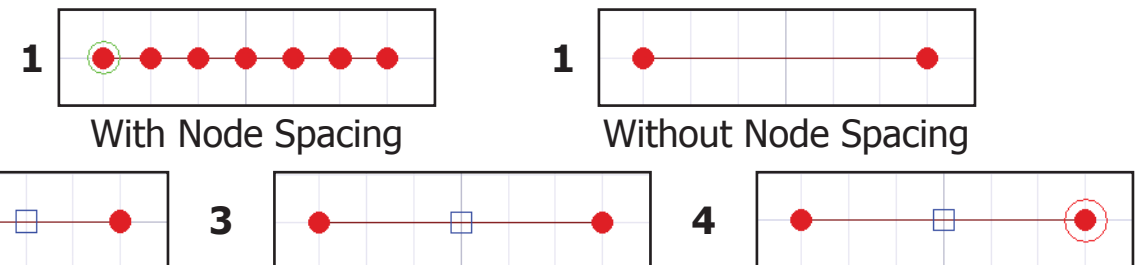
Pattern Tools - Line Examples

Line with Node Spacing:

- This setting is great when you are drawing an item that is round, or smooth.

Line without Node Spacing:

- This setting works best for straight lines and items that have sharp corners.

Spline:

- A spline is a smooth line with two points you are able to adjust, these points are indicated in blue.
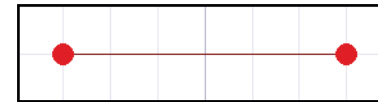
Arc:

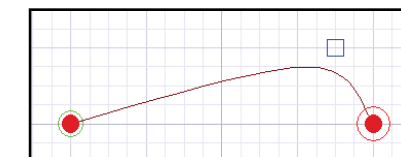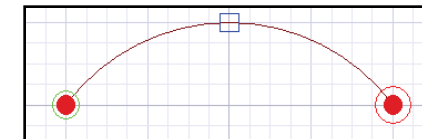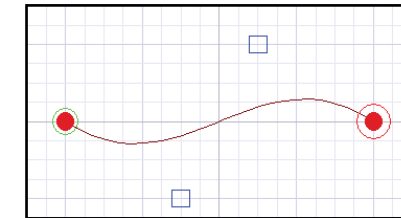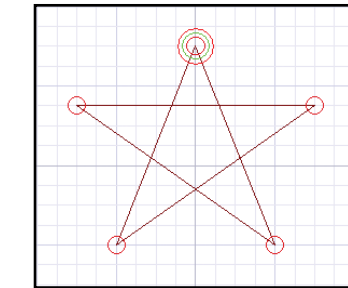- By dragging the blue box, the line will become a smooth, symmetrical arc.

Parabola:

- Similar to an Arc, you can drag the box to extend the line, but the line will stretch in the direction you pull it.
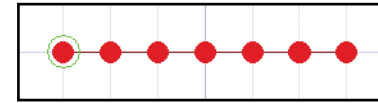
With Node Spacing

Without Node Spacing
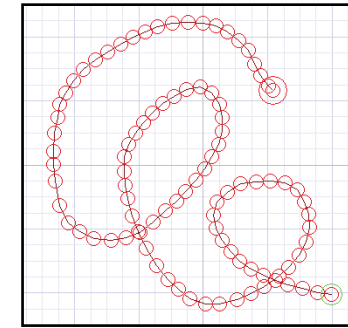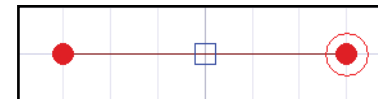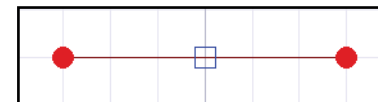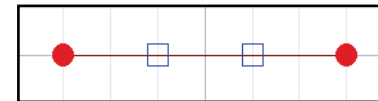
Pattern Tools - Edit Menu

The Pattern Edit section gives you the ability to change the pattern as a whole, or node by node. With the Edit menu there are 6 tools offered. Each one has a corresponding menu as to what that tool is capable of.

Let's cover the basics then review each one.

1. **Select** — Displays the Select menu and selection options.
2. **Size** — Changes to the Size menu, allowing you to change the pattern size.
3. **Move** — Opens the Move menu, allowing you to move nodes or sections.
4. **Flip** — Opens the Flip menu, allowing you to flip nodes and patterns.
5. **Rotate** — Opens the Rotate menu, allowing you to rotate the pattern.
6. **Transform Group** — This tool allows you to manipulate the an entire pattern, or a specific selection by stretching, skewing, and warping.
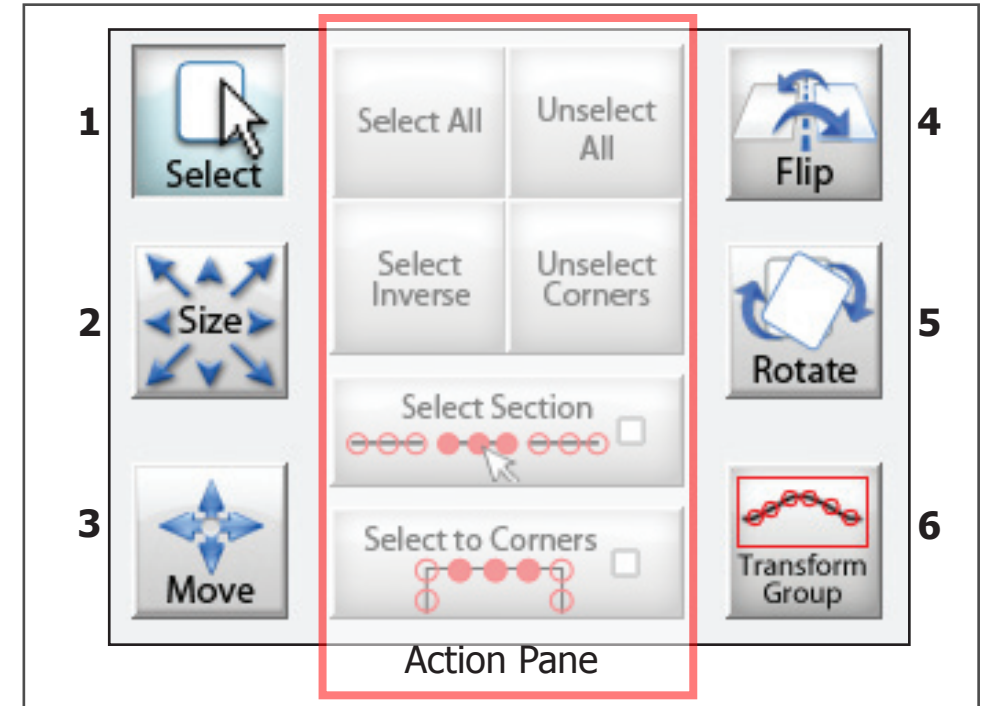
Pattern Tools - Edit: Select

The select tool has many options catering to a number of scenarios. Such as selecting all, inverse selection (opposite), sections, and corners.

1. **Select All** — Selects all nodes.

2. **Unselect All** — Deselects all nodes.

3. **Select Inverse** — Deselects current nodes, and selects nodes that were not previously selected.

4. **Unselect Corners** — Unselects the corner nodes leaving segments nodes selected.

5. **Select Section** — When enabled it gives you the ability to select an entire section by tapping one node of that section.

6. **Select Corners** — When enabled, you can select an entire corner by tapping a single node in that corner.

7. **Smooth** — Smooths the pattern by moving nodes and making the pattern more rounded.

8. **Insert** — Inserts nodes into your current selection. Must be a line with more than three nodes.
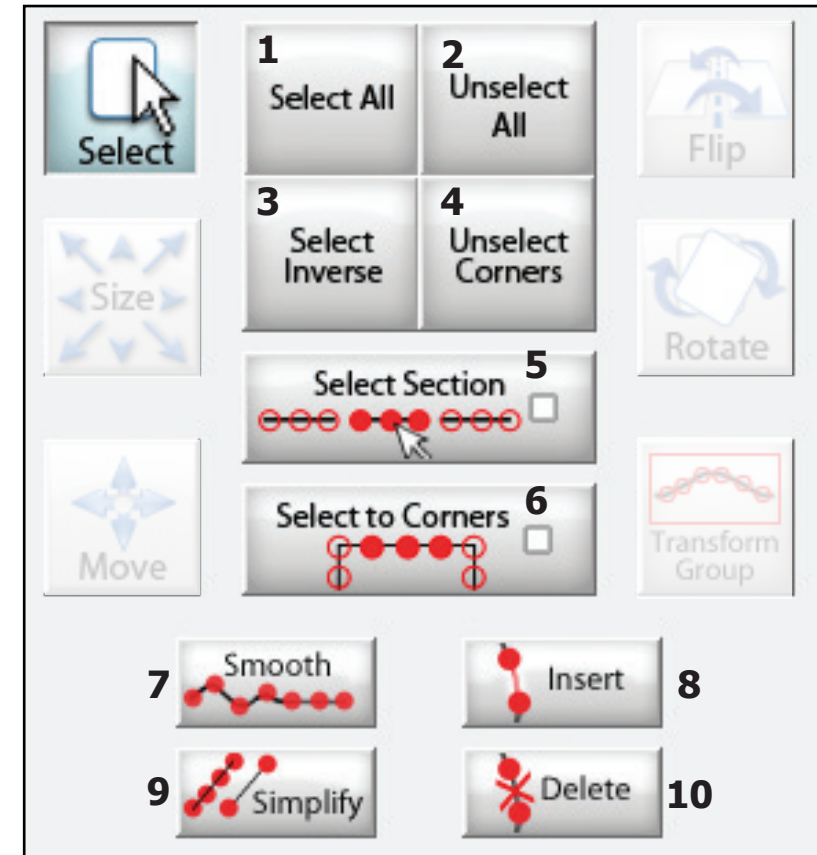
9. **Simplify** — Removes unnecessary nodes giving the pattern better definition.

10. **Delete** — Delete Selected nodes.

Pattern Tools- Edit: Size

The sizing tool is used to make the pattern, or pattern segment larger or smaller. You can expand your selection height and width. The increment of change will be determined by your step size.

1. **Increase Width**— Increases the width of the selection.

2. **Increase Height** — Increases the height of the selection.

3. **Decrease Width** — Decreases the width of the selection.

4. **Decrease Height** — Decreases the height of the selection.

5. **Aspect Ratio Lock** — When enabled, the lock will be closed. This means the width and height will change at the same time. When disabled, the lock will be open and any changes made to height will not effect width and vice versa.
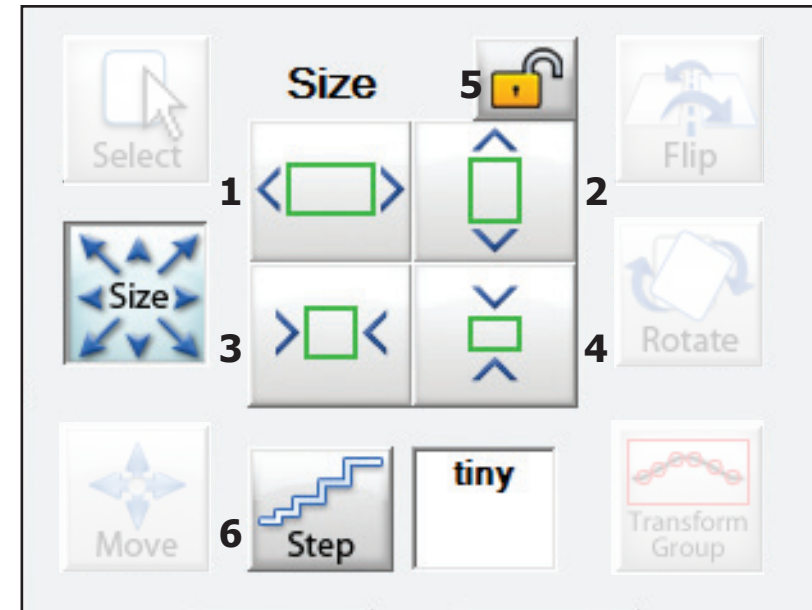
6. **Step Size** — How much the pattern will grow or shrink. There is no numerical formula associated with the step size:

- **Tiny** — A small increment of movement.
- **Small** — A slightly bigger increment of movement than Tiny.
- **Medium** — A bigger increment than Small.
- **Large** — A large increment in movement as compared to Medium.
- **JUMBO** — The largest movement increment.

Pattern Tools- Edit: Move

The move tool allows you to move single nodes or entire selections. The amount of movement will be determined by your step size.

1. **Move Right** — Moves the node or segment to the right one step.
2. **Move up** — Moves the node or segment up one step.
3. **Move Left** — Moves the node or segment to the left one step.
4. **Move Down** — Moves the node or segment down one step.
5. **Step Size** — How much the pattern or selection will move.

   There is no numerical formula associated with the step size:

   - **Tiny** — A small increment of movement.
   - **Small** — A slightly bigger increment of movement than Tiny.
   - **Medium** — A bigger increment than Small.
   - **Large** — A large increment in movement as compared to Medium.
   - **Jumbo** — The largest movement increment.
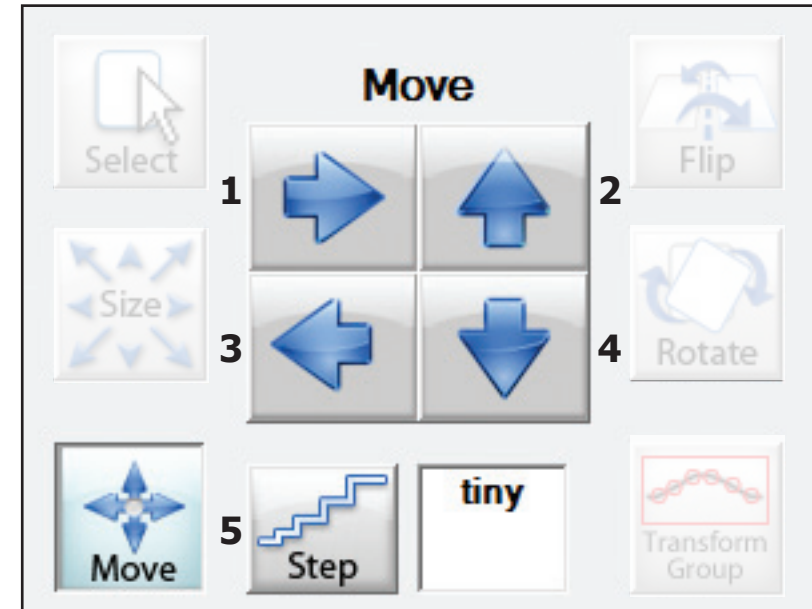
Pattern Tools- Edit: Flip

The flip tool allows you to flip specific nodes or sections of the pattern, or the entire pattern.

1. Flip Vertically — Flips the selection or pattern Vertically.

2. Flip Horizontally — Flips the selection or pattern Horizontally.

There is no step size associated to this tool.
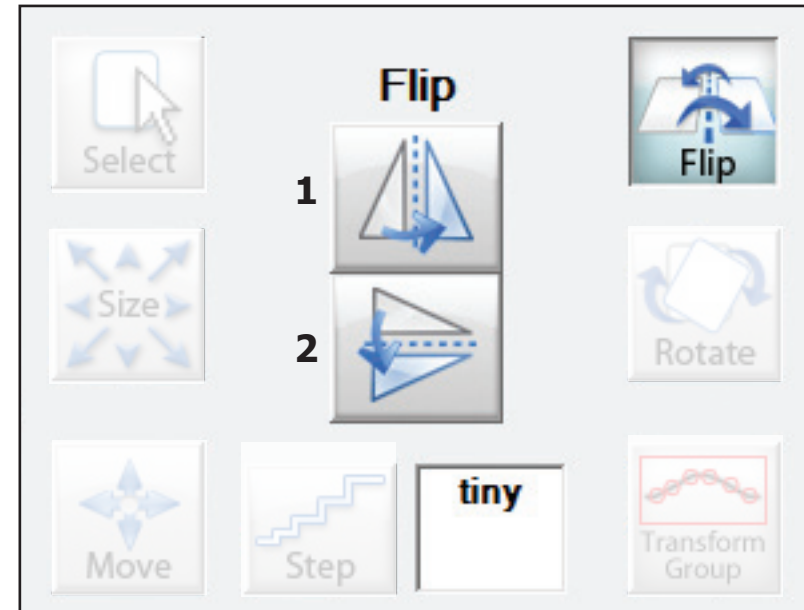
Pattern Tools- Edit: Rotate

The rotate tool allows you to change the angle of a pattern. There is no step size associated with this tool.

1. Rotate 1º —Rotates the pattern or selection 1º

2. Rotate 5º — Rotates the pattern or selection 5º

3. Rotate 15º — Rotates the pattern or selection 15º

4. Rotate 45º — Rotates the pattern or selection 45º

5. Reverse — Changes the direction the pattern will rotate.

By default the pattern will rotate to the left, reverse makes it rotate right.
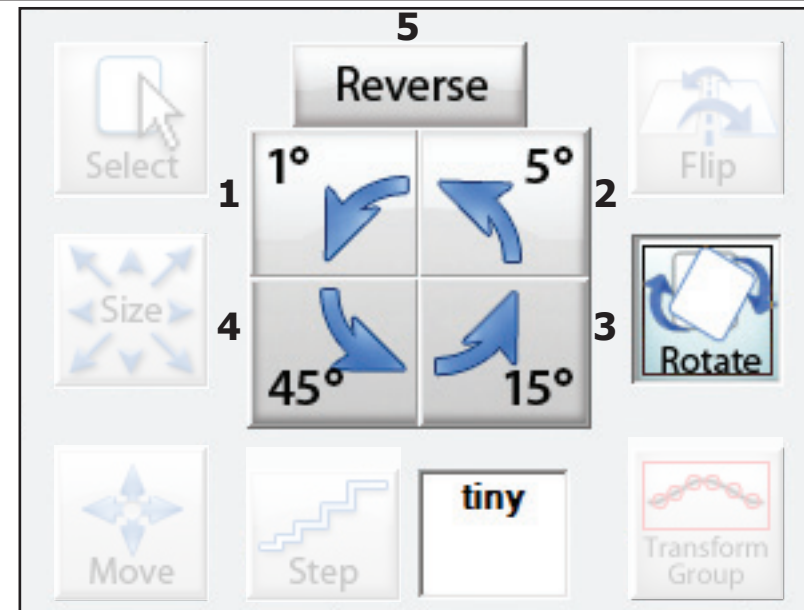
Pattern Tools- Edit: Transform Group

Transform Group is one of the newest tools to be implemented into PatternCAD. It allows you to make changes to the entire pattern without going in and modifying each individual node setting. To access this tool, you must have nodes selected.

1. **Stretch** — This options allows you to stretch the pattern. The red circles are to stretch the pattern by its corners. The blue boxes are to stretch just the top and bottom or sides.
2. **Skew** — Skews the pattern selection to give it a skewed or elongated pattern.
3. **Warp** — This tool allows you to warp the pattern using 4 corner nodes, plus 8 additional side nodes. Each spot is moved independently and will apply its effect to that portion of the pattern.

When you are done designing your pattern don't forget to Optimize it!
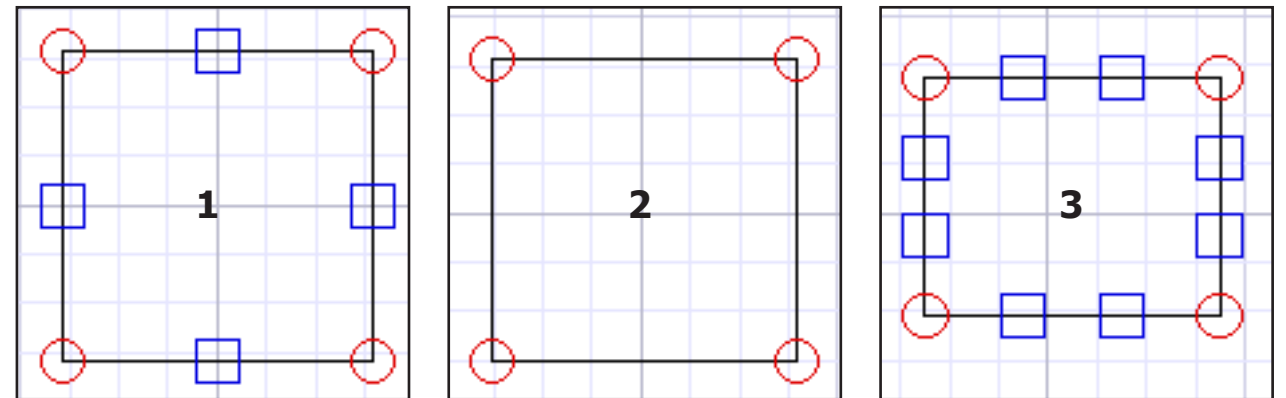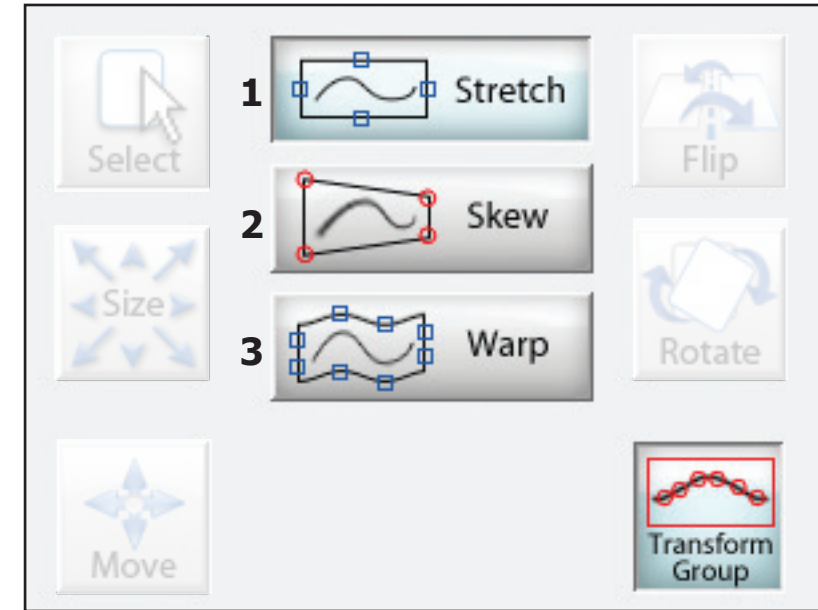
Mirrors - Draw

Mirrors can take a simple pattern and turn it into the centerpiece of your quilt. Lets look at some of the settings and what they are capable of.

1. **Double Sided Mirror** — Enables and Disables the Double Sided mirror.
2. **Mirror Draw Tool** — This is the option you will use to draw a mirror. When you enable mirror segments you can adjust the length of the segment with the + and - buttons.
3. **Mirror Segment Length** — Adjust the distance between each mirror segment.
4. **Remove One Segment** — Goes back one segment in the mirror line.
5. **Add One Segment** — Will add the segment back if it has been removed.
6. **Horizontal** — Places a horizontal mirror with one segment.
7. **Horizontal 2** — Place a horizontal mirror with two segments.
8. **Horizontal and Vertical** — Places four mirror segments. Two horizontally and two vertically, each the same length.
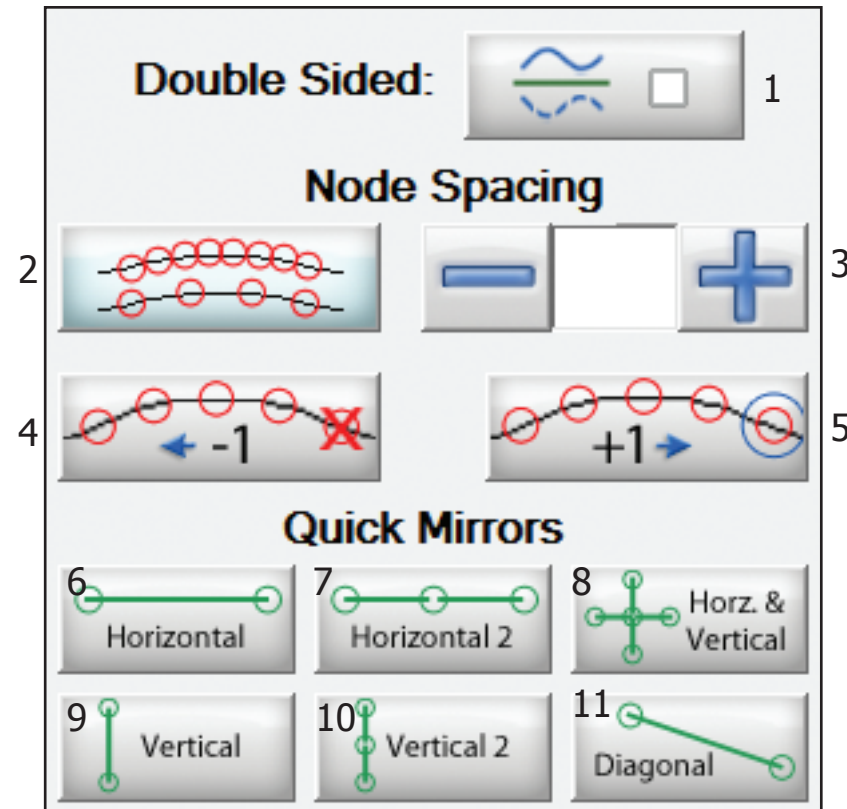
Quick Mirrors allow you to quickly place preset Mirror segments. Once you select and place one, it can be edited to your liking.

9. **Vertical** — Places a vertical mirror with one segment.
10. **Vertical 2** — Places a vertical mirror with two segments.
11. **Diagonal** — Places a diagonal mirror with one segment.

Mirrors - Edit: Size

Size

1. **Increase Width** — Increases the width of the mirror.

2. **Increase Height** — Increases the height of the mirror.

3. **Decrease Width** — Decreases the width of the mirror.

4. **Decrease Height** — Decreases the height of the mirror.

5. **Aspect Ratio Lock** — When enabled, the lock will be closed. This means the width and height will change at the same time. When disabled, the lock will be opened, and any changes made to height will not effect width and vice versa.
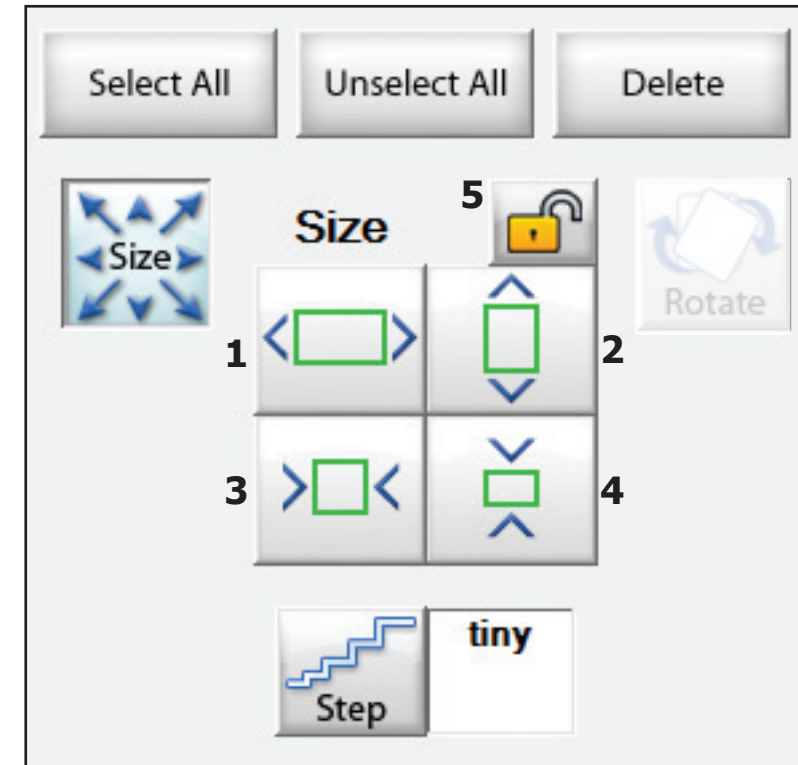
Rotate

1. **Rotate 1º** —Rotates the mirror or selection 1º

2. **Rotate 5º** — Rotates the mirror or selection 5º

3. **Rotate 15º** — Rotates the mirror or selection 15º

4. **Rotate 45º** — Rotates the mirror or selection 45º

5. **Reverse** — Reverses the direction the mirror will rotate.

By default the pattern will rotate to the left, reverse makes it rotate right.
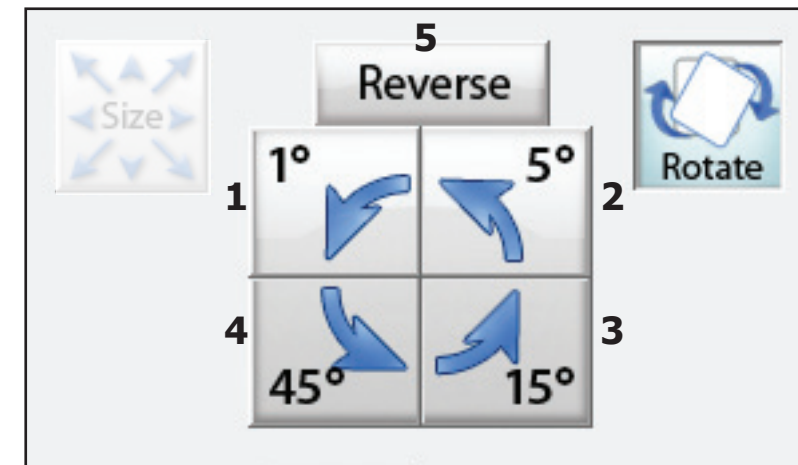
EZ, Easy Pattern Creator

The EZ section offers tools to quickly make patterns by quickly adjusting the settings or you can use them as base settings to create something unique!

There are six EZ templates, some are mirrors while others are lines.

1. Flakes, **Mirror type** — Places a "snow flake" mirror on the design space. You can have a minimum of 1 branch of the flake and maximum of 16. You also have the option of making the Mirror single or double sided.

2. Polygons, **Line type** — Places a polygon into the design area. You can set how many sides it has from a minimum of 3 sides to a maximum of 50.

3. Poly Mirrors, **Mirror type** — Places a polygon mirror onto the design area. You can set how many sides it has from a minimum of 3 sides to a maximum of 50.

4. Spirals, **Line type** — Places a spiral line onto the design area. You can set how many spirals there are from a minimum of 2 to a maximum of 75. You can also set the radius of the spirals from a minimum of 2 to a maximum of 25.

5. Bow Ditches, **Line type** — Makes a looping pattern, this one will be more square than the spiral option. The maximum change for all options on this EZ pattern is 16.

6. Hilberts, **Mirror type** — Great for making a stipple pattern.

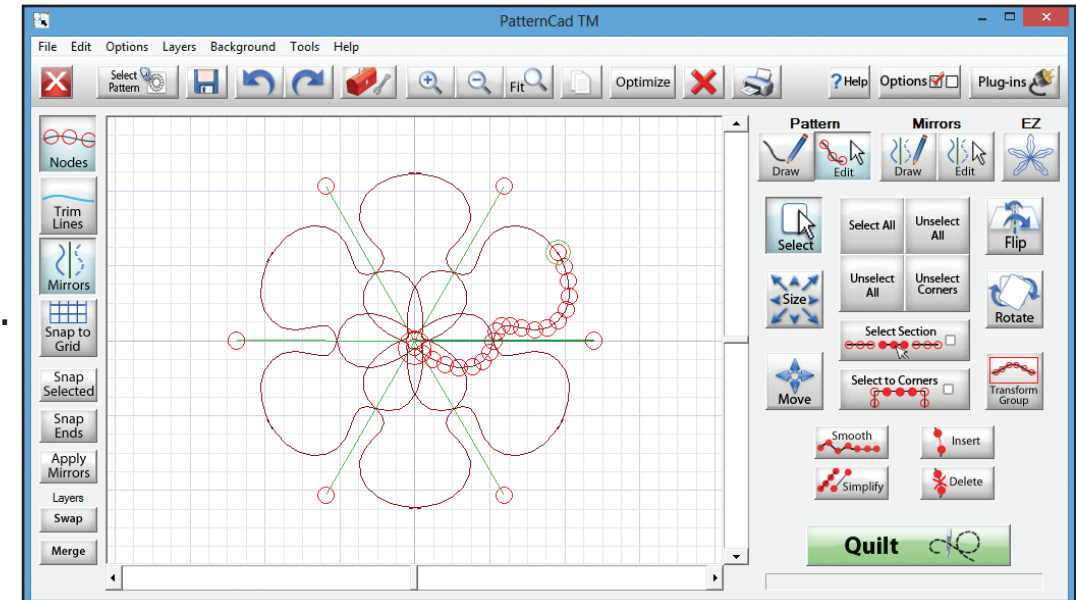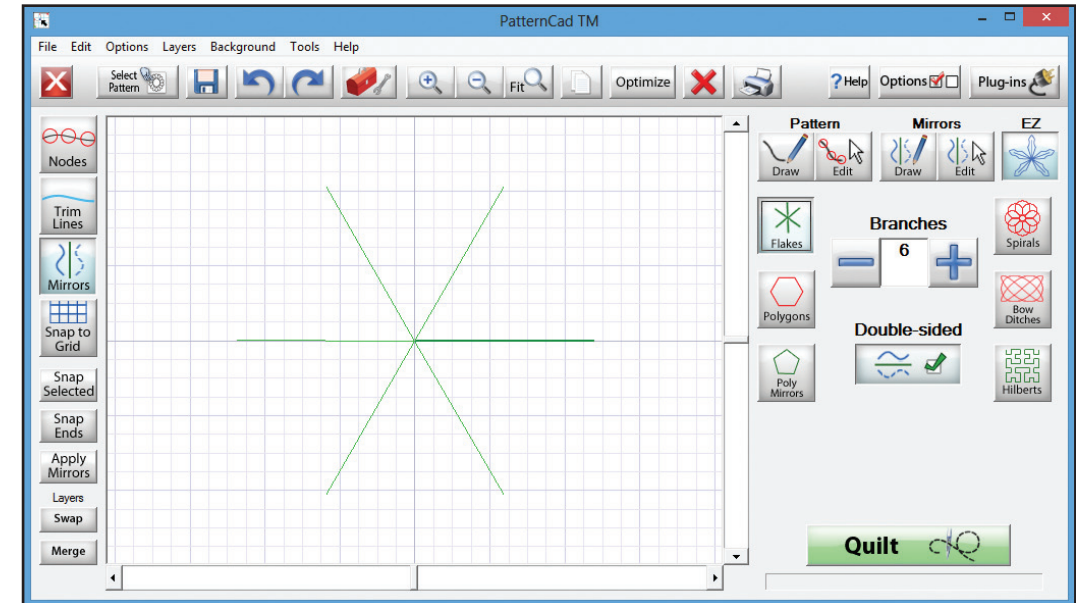
EZ pattern Option area

Green = Mirrors
Red = Lines
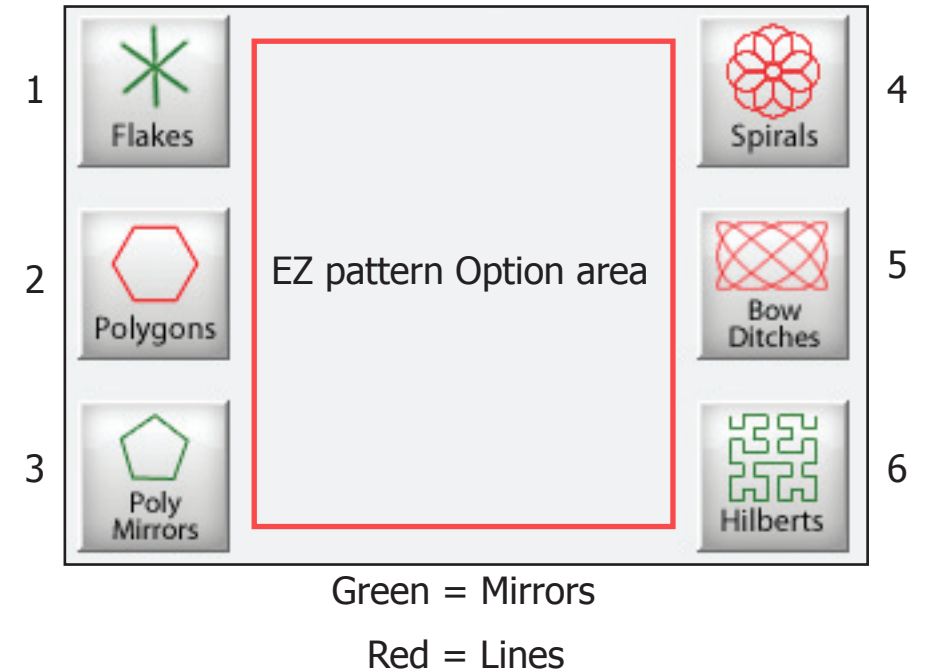
EZ: Flakes - Mirror Type

By default the Flake will start out with six double sided mirrors. You can change the number of Mirrors and choose to have it Double Sided or not.

- Minimum Mirrors 1
- Maximum Mirrors 16

You can adjust the length of the mirrors in the Edit Mirrors section.
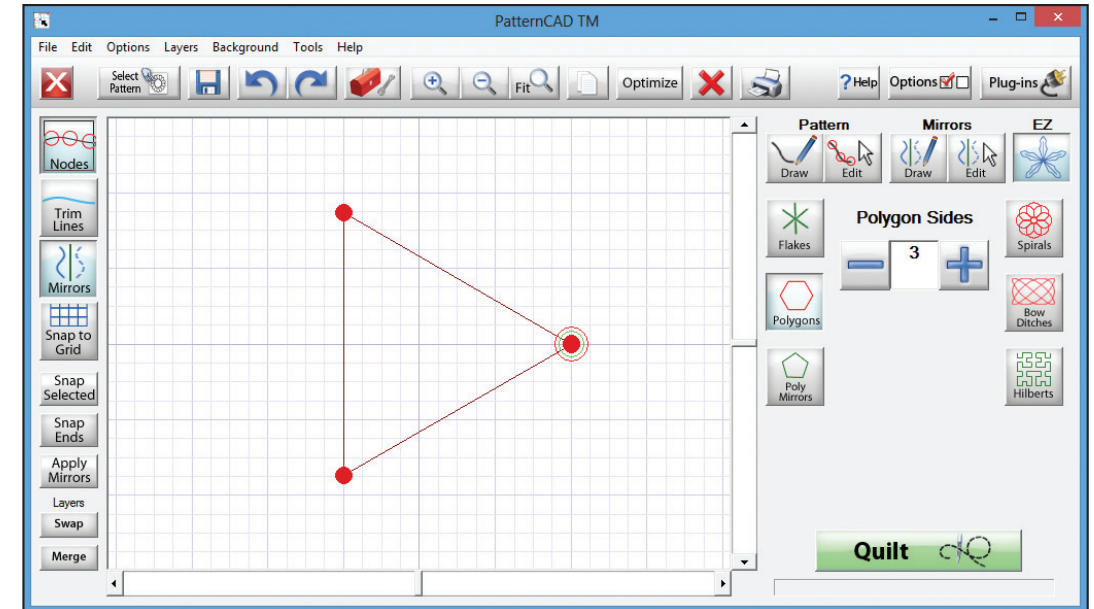
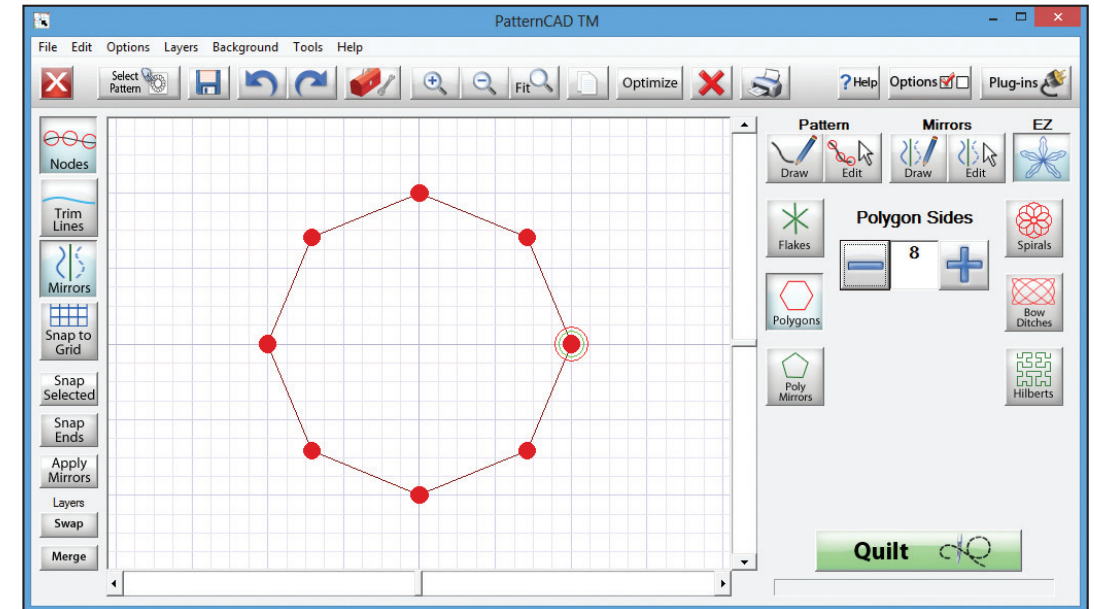Here is an example of the Flake EZ pattern.

EZ: Polygons - Line Type

The Polygon EZ creator is fairly basic. It will create a polygon based on the number of side you prefer it to have.

- Minimum Sides 3
- Maximum Sides 50

If you set the maximum sides to 50 it will create a very nice circle to work with, but don't forget it is a object with 50 sides.

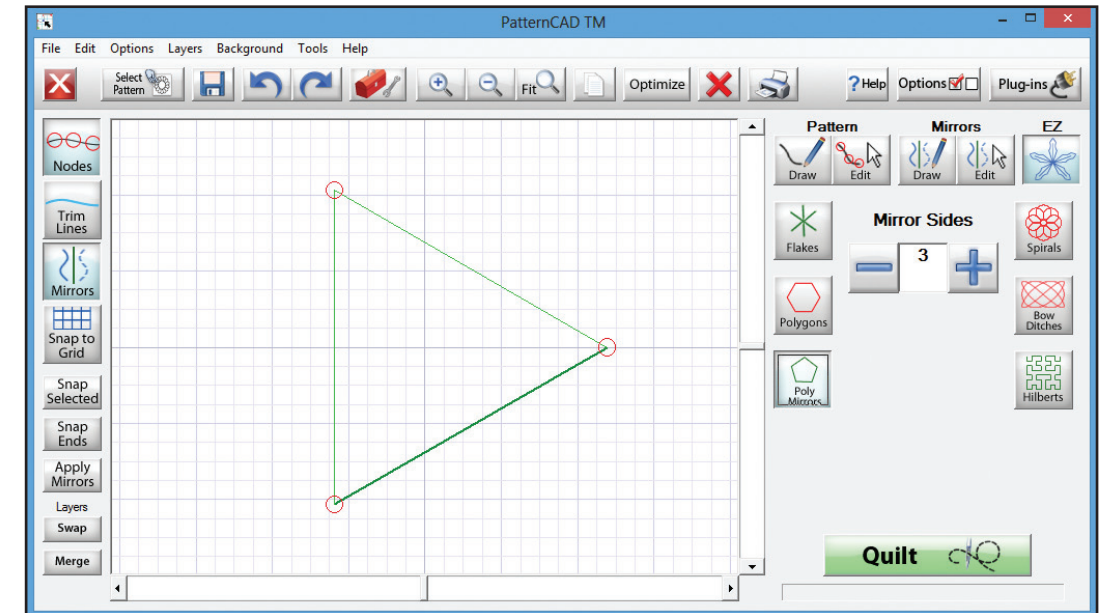Here is an example of a 8 sided Polygon.

EZ: Poly Mirrors - Mirror Type

The Poly Mirror has the same settings for the Polygons. It will create a polygon mirror based on the number of side you prefer it to have.

- Minimum Sides 3
- Maximum Sides 50

If you set the maximum sides to 50 it will create a very nice circle to work with, but don't forget it is a object with 50 sides.

Here is an example of a 4 sided Poly Mirror with 1 Parabola.
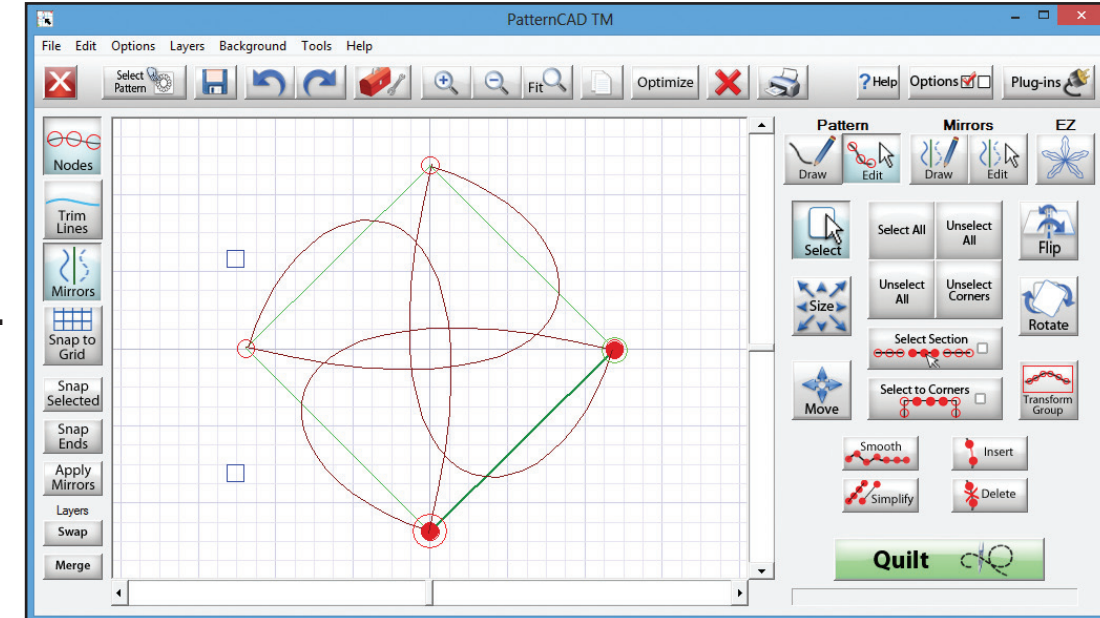
EZ: Spirals - Line Type

The Spiral Option quickly makes a pattern by setting how many spirals it will have, and then the radius of those spirals.
This type of pattern will have the start and end points at the same location.

- Minimum Spirals 2
- Maximum Spirals 75
- Minimum Radius 2
- Maximum Radius 25

Here is an example of a 7 Spirals with a radius of 23.
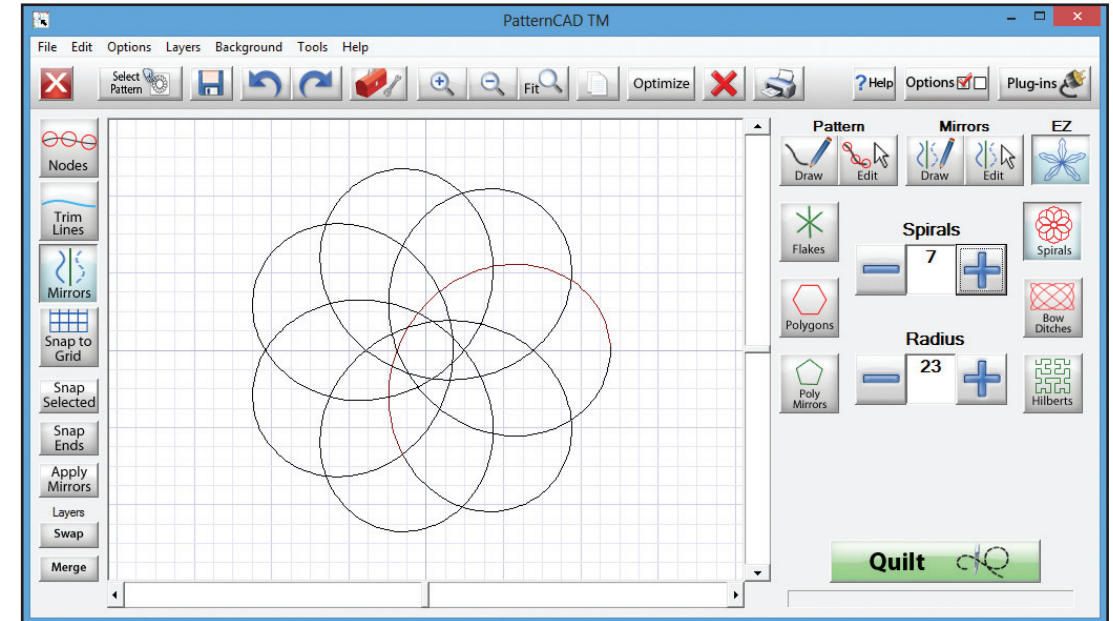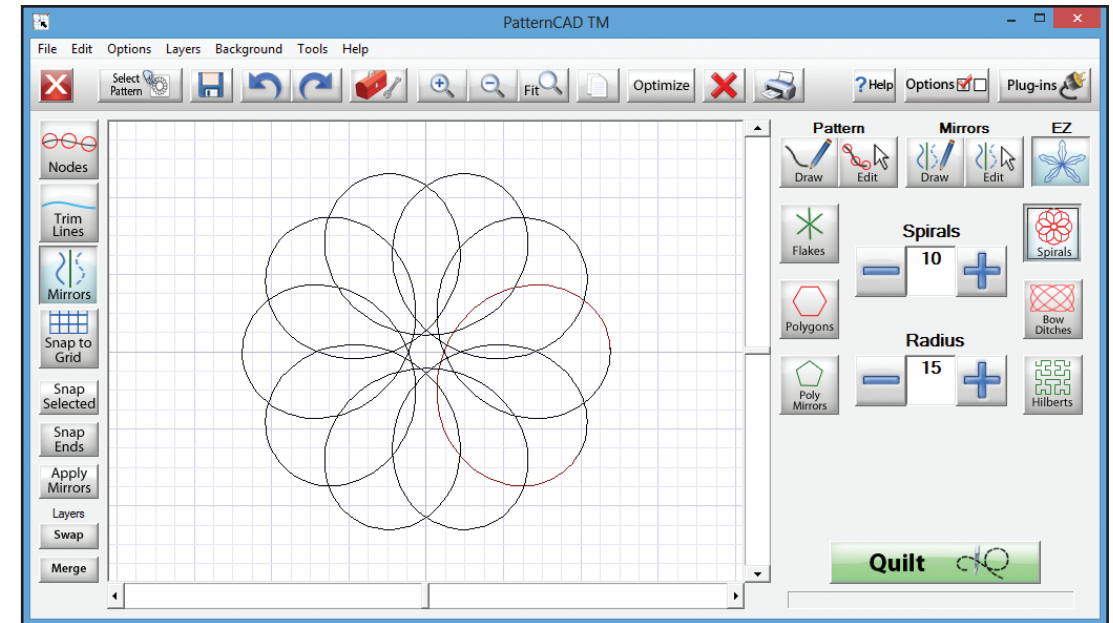
EZ: Bow Ditches - Line Type

The Bow Ditches feature is a great way to design quick and easy patterns for filling space on your quilt.
There are 3 settings for the Bow Ditches, each one will effect the pattern differently.
This gives you the ability to create a wide variety of patterns.

Shown here is an example with the settings at 7, 8, and 8
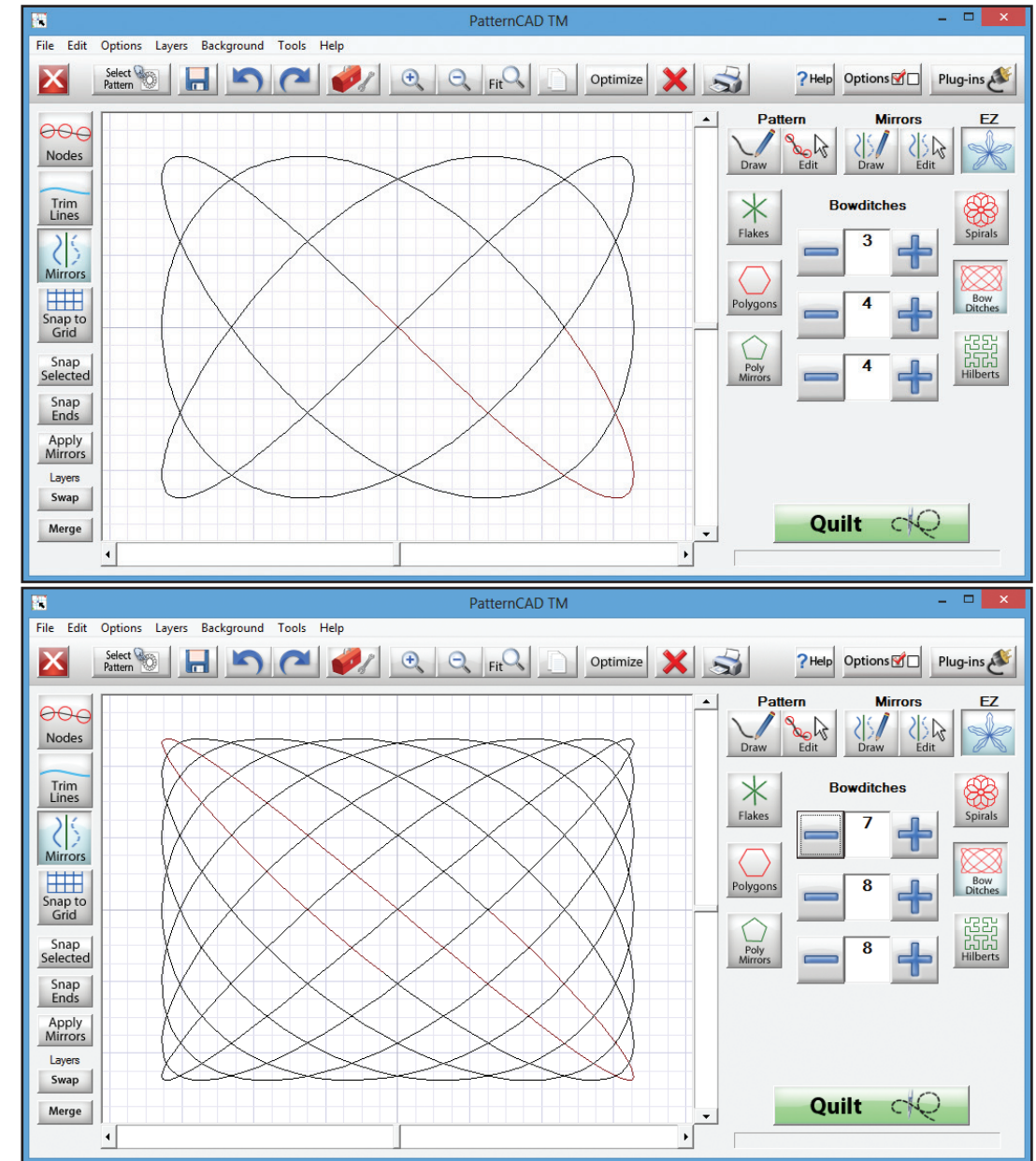
EZ: Hilberts - Mirror Type

A Hilbert is a line or loop that grows in size while becoming gradually more complex.
This pattern creator helps you easily create a complex mirror design. These can be used to create custom stipple patterns, or complex fill patterns.

There are two options for this pattern template; Density and Randomization.

The density settings relates to how many mirror, or how complex the line is. The randomization is the articulation on the line, giving them an angle instead of being straight, further increasing the complexity of the design.

This Hilbert has a Density of 2 and Randomization of 0
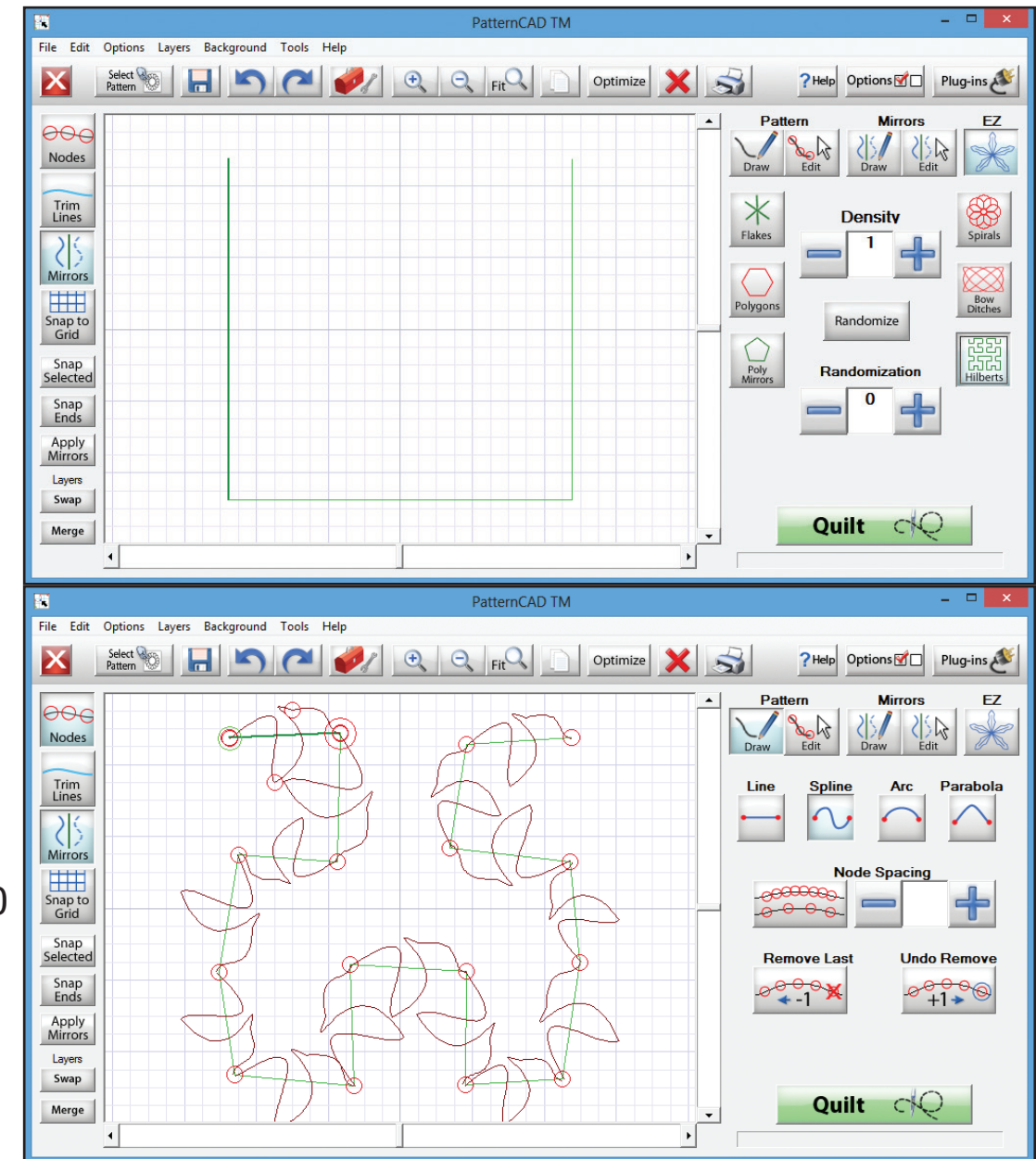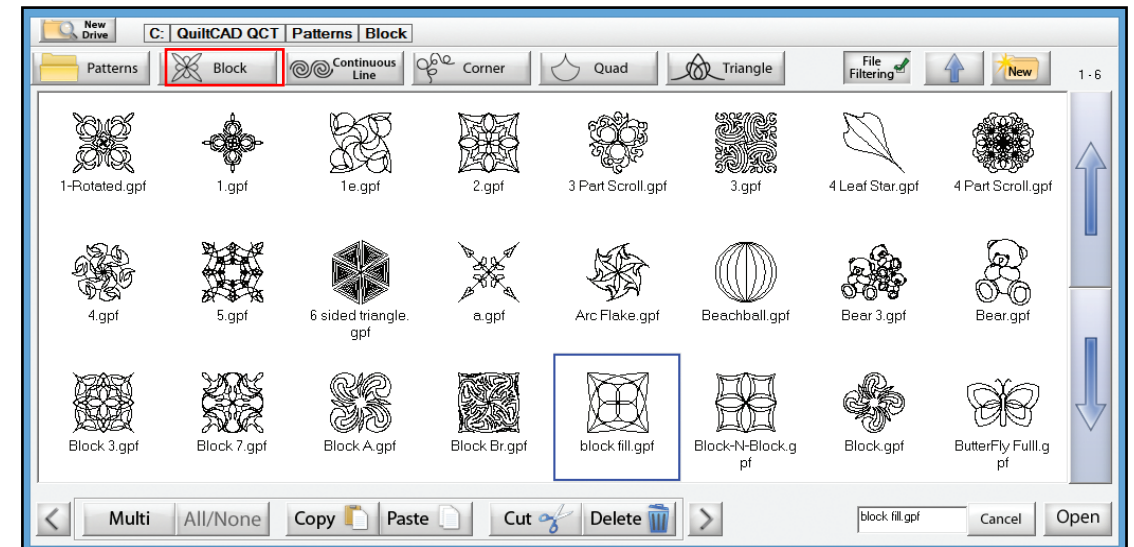
Select & Sew: Pattern

With the Select & Sew feature you can be quilting in just a few simple steps, with a single pattern, a pantograph, or an entire quilt.

When you tap the Pattern option under the Select & Sew the first screen you will see is the Set Safe Area screen.

After the safety area has been set you can choose a pattern.

For this example we will use the blockfill1.gpf from the Block pattern section, but you can use any pattern you would like.

To open a pattern you can double tap the pattern you want to open, or tap it once to highlight it and then tap Open to open the pattern file.

Select & Sew: Pattern Continued

Once you select a pattern you will be taken to the placement screen.
Now all you need to do is place the pattern and sew! For a quick
review here are the steps taken:

1. Set your Safety Area
2. Pick a pattern
3. Place the pattern
4. Pull Bobbin
5. Sew the pattern

From there you can either choose another pattern, or place the same
one in a different spot.
This allows you to quickly sew any number of patterns you need.