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To Our Customers
Thank you for purchasing Ready 2 Design – Laser Edition (R2D-LE) software. It includes a full suite of drawing and toolpath tools for creating a wide range of designs and projects. R2D-LE provides the tools needed to create original vector line and raster designs as well as from imported clip art and photographs. Toolpath outputs allow you laser engrave, fill areas with crosshatch or raster engraving.

You can run your R2D-LE created designs on any of the Next Wave Automation (NWA) laser systems, including the 2, 4 and 7 watt laser accessories for the Piranha with Pendant controller and CNC Shark HD4 with Pendant controller, as well as the desktop Moray Laser machine. If your CNC does not have a Pendant controller, please contact our Sales team for upgrade options.

Please read this manual carefully. It provides setup and operational information for your R2D-LE software. It has been written with the assumption that user is familiar with the basic operation of a computer as well as the required technical knowledge required to safely operate power tools including NWA laser products. Refer to owners manuals for your specific laser product for information on their operation.

Thank you again for purchasing Ready 2 Design – Laser Edition (R2D-LE) software.

For Technical Support please please visit the Support page at our website or email us at: support@nextwaveautomation.com
Include your product model number, date of purchase, and any other pertinent information that may be helpful such as .tap files, .crv files, screen captures, and photos of your setup or problem.

For product sales contact us:
By email: info@nextwaveautomation.com
Or phone: (419) 318-4822

Next Wave Automation, LLC,
600 W. Boundary St., Perrysburg, Ohio 43551 USA
Main Office Phone (419) 318-4822
**Warranty**

Next Wave Automation (NWA) warrants to the original retail purchaser of a Ready2Design-Laser Edition (R2D-LE) when purchased from an authorized NWA distributor, will be free from defects in material and workmanship for ONE YEAR from the date of purchase. This warranty is for parts and labor to correct the defect, and does not cover the cost of shipping the defective item(s) to Next Wave Automation for repair. Warranty coverage requires proof of purchase (copy of sales receipt).

This warranty does not apply to defects arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance. This warranty is void if the Moray Laser or any portion of the Moray Laser is modified without the prior written permission of Next Wave Automation, LLC, or if the Moray Laser is located or has been used outside the country of residence of the Moray Laser distributor from whom the Moray Laser was purchased.

Please contact Next Wave Automation to take advantage of this warranty. If Next Wave Automation determines the Moray Laser or Moray Laser accessory is defective in material or workmanship, and is not due to normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance, then Next Wave Automation will, at its expense and upon proof of purchase, send replacement parts to the original retail purchaser necessary to remedy the issue. Next Wave Automation will repair the Moray Laser or Moray Laser accessory provided the necessary Moray Laser component is returned to Next Wave Automation, shipping prepaid, with proof of purchase and within the warranty period.

Next Wave Automation disclaims any and all other express or implied warranties, including fitness for a particular purpose. Next Wave Automation shall not be liable for death, injuries to persons or property, or incidental, consequential, contingent or special damages arising from the use of the Moray Laser.
When operating a laser tool, you should always wear the appropriate eye protective. The laser should be operated with extreme caution to prevent directly exposing your eyes or skin to the laser light.

See the owner manual for your laser for additional safety information.
1. Visit [https://portal.nextwaveautomation.com](https://portal.nextwaveautomation.com) and create a new User Account or open your existing account.

2. Click Software tab and then the green plus sign to add your software.
Software registration and installation (cont.)

   Enter the License Pair AB codes that came with your product.
   Click Register Software.

A License Pair numbers card is packed with your product. Use these numbers to register and access the R2D LE software.
Software registration and installation (cont.)


5. Double click on the name to bring up a local info window.

6. Click download link to download R2D-LE.
Software registration and installation (cont.)

7. Save file to your computer.

8. Locate file and double click to open install window.

9. Click the "I agree" checkbox and the Install button.

10. Click Launch to use now, or Close to use later.
Section 3 – Software startup and overview

Open R2DLE from the desktop shortcut or your Programs window

3.1 Startup window
When R2D-LE first opens you have the option to:
• Create a new project (see Set Workspace page 13)
• Open an existing project
• Choose from a list of recent projects
3.2 Set Workspace (create new project window)

Selecting Create New Project on the start window opens the Set Workspace window. In this window you set the dimensions, Anchor Position (XY zero position) and Anchor Point (XY zero offsets) for your project.

Enter the **Width** (X) and **Height** (Y) dimensions for your project here.

**Set Workspace** opens with a set of **Preset Dimensions**. To change Preset Dimensions see page 70.

These functions are not active until after workspace has been created and saved. See page 15.

Select the **Anchor Position** (XY zero) for your project here.

Enter **Anchor Point** (XY offsets) for your project here.

Click to **Create** your project workspace.

**Resets** workspace perimeters to the default settings. To change default settings see page 70.
3.3 Tools - overview

The project workspace has design tools displayed along the left side. Many of these tools and few additional functions are available from the drop-down menus at the top. Details for each tool group are covered on the pages listed below.
Section 4 – File operations and tools

New Project – Opens Set Workspace window. See page 13 for more information.

Open Project – Opens an existing project.

Save Project – Saves the current project.

Import Project – Use to import .r2d, .dxf, or .pdf files into an open project.

Import Image – Use to import a .jpg, .jpeg, .png or .bmp file.

Workspace – Use to edit the workspace settings for a saved project. See below for more info.

Workspace

Enter the Width (X) and Height (Y) dimensions for your project here.

Preset Dimensions. To change the preset dimensions see page 70.

Set Relative to Entity aligns Workspace Anchor Position to bottom center of a selected object.

Expand to Artwork enlarges workspace to include all design elements.

Changes the Anchor Position (XY zero) for the open project.

Adjusts the Anchor Point (XY offsets) for open project.

Click to Update to apply changes.

Resets workspace perimeters to the default settings. To change default settings see page 70.
Section 5 – Edit tools

SPACE BAR = SELECTION TOOL
Press the Space bar to exit an active tool and enter the selection mode.

**Undo** – Undo the last edit

**Redo** – Redo the ‘Undo’

**Cut** – Deletes selected object (deleted item can be pasted)

**Copy** – Copies selected object (copied items can be pasted)

**Paste** – Pastes cut or copied object

**Select All** – Selects all visible object

**Group** – Combines selected objects into a group

**Ungroup** – Ungroups objects that are grouped

* **Remove Item from Group** – Removes a single object from a group.

* **Explode Geometry** – Breaks selected vector object into individual parts

* **Trim** – Trims vectors based on selection and neighboring intersections

**Cookie cutter** – Removes the image around a closed vector shape. See page 17

**Inverse Cookie cutter** – Removes the image inside a closed vector shape. See page 18

* **Edit Text Spacing** – Increases or decreases text spacing. See page 43

* **Erase** – When the tool is active, clicking on any object will delete the object.

**Delete** – Selected objects are deleted when this icon is clicked.
5.1 Cookie Cutter

1. Set layer option to **Select Across Layers** (see page 66)
2. Select both picture and closed vector shape
3. Click on Cookie Cutter tool.
4. The portion of the picture outside the vector shape is removed.
5.2 Inverse Cookie Cutter

1. Set layer option to **Select Across Layers** (see page 66)
2. Select both picture and closed vector shape
3. Click on Inverse Cookie Cutter tool.
4. The portion of the picture inside the vector shape is removed.
Section 6 – Transform tools

Move – Opens Move tool window (see page 20)

Scale – Opens Scale tool window (see page 20)

Rotate – Opens Rotate tool window (see page 21)

Alignment – Opens Rotate tool window (see page 21)

*Make Line Horizontal – aligns line vertical to it’s center point

*Make Line Vertical – aligns line horizontal to it’s center point

*Set Origin Relative to Entity – aligns Workspace Anchor Position (XY Zero location) to the bottom center of the selected object

Press the Space bar to exit an active tool and enter the selection mode.
6.1 Move tool window

**Absolute** – Moves selected object relative to Workspace Anchor Position (XY zero)

**Relative** – Moves object relative to its current location

**Position** – Enter the desired move-to location

**Anchor Position** – This point on the object moves to the Position entered above.

**Apply** – Applies move operation

**Close** – Closes Move window

6.2 SCALE tool window

**Width (X) and Height (Y)** – Enter either new dimensions or percentages

**Link XY** – Check box to scale X and Y an equal percentage

**Anchor Position** – Apply scale change relative to this point of the selected object

**Apply** – Applies changes

**Close** – Closes Scale window
6.3 Rotate tool window

**Angle** – Enter positive number to rotate selected object counterclockwise and a negative number to rotate clockwise

**Anchor Position** – Apply rotation relative to the this point on the selected object

**Apply** – Applies changes

**Close** – Closes Scale window

6.4 Alignment tool window

**Align to corner** – Aligns selected object(s) to a workspace corner

**Align to side** – Aligns selected object(s) to the middle of a workspace side

**Align to vertical** – Aligns selected object(s) to the workspace's vertical middle

**Align to horizontal** – Aligns selected object(s) to the workspace's horizontal middle

**Align button** – click to apply changes

**Close button** – click to close window
Section 7 – View tools

Gridlines OFF

Gridlines ON – Vector drawing tools in the Create tool group will snap to gridline intersections. Zooming in on drawing will increase the number of grid lines. Zooming out will decrease the number of grid lines. The Gridlines On tool will glow blue when active.

Center Around Origin – Moves the Workspace Anchor Position (XY zero) to the middle of the viewing area.

Center Around Drawing – Zooms view to include all visible objects, including those that appear outside of the project workspace.

Center Around Workspace – Zooms view to the boundaries of the workspace.

Measure Tool – Use to measure distances and angles. Opens Measure Tool window (below).

7.1 – MEASURE TOOL window

Mouse click 1

Mouse click 2

Selected object info (the square in this case)

Measured distance info (the dotted line)
Section 8 – Create tools

Line  see page 23

Rectangle  see page 29

Polygon  see page 31

Circle  see page 33

Arc  see page 35

Ellipse  see page 38

Text  see page 41

Offset  see page 45

Join  see page 46

Fillet  see page 47

Image Trace  see page 50

Array Copy  see page 59

Circular Copy  see page 60

Toolpaths – see page 61
8.1 – Create Line tool
There are four primary ways to create lines in R2D-LE

Option 1 - Plot a line by Start Point, End Point and/or Length

1. Default dotted line appears when window first opens
2. Edited Start Point as needed
3. Enter End Point as needed
4. Press TAB key or click in another perimeter field to preview new line
5. Length and Angle autofill
6. Length can be edited and overrides the End Point numbers
7. Edit parameters as needed.
8. Click Create to create line
9. Repeat above steps as needed
10. Click Close to exit tool window
11. To edit the length and position of the line after it's been created see page 28

Note: The Angle entry in the Create Line window is for reference only and is not editable in this window.
To draw a line to specific angle follow these steps:
1. Draw a line to the desired length using the Create Line tool.
2. If needed, use the Make Line Horizontal or Make Line Vertical tools to make the line precisely horizontal or vertical, see page 19
3. Use the Rotate tool to precisely set the angle of the line. See page 21
Create Line tool (cont.)

Option 2 – Draw lines using only the mouse

1. To set **Start Point**, left mouse click in drawing area.*
2. Keep left mouse button depressed
3. Move mouse to draw (dotted) line
4. Release left mouse button to create **End Point** for the line.*
5. Line dimensions autofill and are for reference only and cannot be edit when using this method to draw a line.
6. To edit the length and position of the line after it’s been created see page 28

* To snap to a grid, turn on Gridlines. See page 22.

**Note:** The **Angle** entry in the Create Line window is for reference only and is not editable in this window.
To draw a line to specific angle follow these steps:
1. Draw a line to the desired length using the Create Line tool.
2. If needed, use the Make Line Horizontal or Make Line Vertical tools to make the line precisely horizontal or vertical, see page 19
3. Use the Rotate tool to precisely set the angle of the line. See page 21
Create Line tool (cont.)

Option 3 – Draw lines using the mouse and the dimension fields

1. To start the line, left mouse click in the drawing area.
2. Move mouse to draw line.
3. Repeat left button click to create the end of the line (line appears dotted)
4. Edit dimension fields as needed.
5. TIP: the TAB key to navigate between dimensions fields.
6. Click Create to anchor line. Line turns solid.

Note: The Angle entry in the Create Line window is for reference only and is not editable in this window.
To draw a line to specific angle follow these steps:
1. Draw a line to the desired length using the Create Line tool.
2. If needed, use the Make Line Horizontal or Make Line Vertical tools to make the line precisely horizontal or vertical, see page 19
3. Use the Rotate tool to precisely set the angle of the line. (See page 21)
Option 4 - Continuous line mode

Use the Continuous mode to create multi-segmented lines with connected start and end points.

1. Check box next to Continuous
2. Enter Start and End Points for first line segment. Line will appear as a dotted line.
3. Click Create to apply line segment settings
4. Enter next End Point setting for next line segment
5. Click Create to apply End Point settings and create new line segment.
6. Repeat as needed.
7. Click Close to complete line and exit window.

Continuous lines can also be created by mouse clicking directly in the drawing area.

Note: The Angle setting is for reference only and cannot be edited

Editing a continuous line:
A continuous line can be scaled as a group using the Scale tool (page 20). Individual segments of a continuous line can only be edit after the continues line is broken into individual segments using the Explode Geometry tool (page 16). Once exploded, the Individual segments can be edited using the Edit Line tool (page 28) or Scale tool (page 20).
8.2 – Edit Line tool

To edit a line:
1. Close all tool windows
2. Select a single line segment*
3. Open Line tool. (With a line selected the Line tool opens as the Edit Line tool)
4. Edit selected line as needed. (The line appears dashed during editing.)
5. Click Apply to save changes and close Line Rectangle window.

Angle is for reference only and cannot be edited in this window.
To change angle use Rotate tool (see page 21).

*Shapes (i.e. polygons) and multi-segmented lines must be "exploded" into individual segments before they can be edited. See page 16 for information on the Explode tool.
8.3 – Create Rectangle tool

1. Enter XY **Anchor Point**
2. Enter **Width** (X) and **Height** (Y)
3. Enter Rotation
4. Enter XY **Anchor Position**
5. Click **Create** to apply rectangle parameters
6. Repeat to create additional rectangles.
7. Click **Close** to exit window

To edit a rectangle see page 30.
8.4 – Editing a Rectangle

To edit a rectangle use one or all of the following tools:

- Scale tool (page 20)
- Rotate tool (page 21)
- Explode tool (page 16)
  (The Explode tool divides the rectangle into four individual line segments.)
8.5 Create Polygon tool

1. Enter XY **Center Point**
2. Enter **Radius**
3. Enter number of **Sides**
4. Enter **Angle** (rotation)
5. Click **Create** to apply Polygon parameters
6. Repeat to create additional polygons.
7. Click **Close** to exit window

To edit a polygon see page 32
8.6 Editing a polygon

To edit a Polygon use one or all of the following tools:

- **Scale tool (page 20)**
- **Rotate tool (page 21)**
- **Explode tool (page 16)**
  (The Explode tool divides the polygon into individual line segments.)
8.7 Create Circle tool

1. Enter XY **Center**
2. Enter **Radius**
3. Click **Create** to apply circle parameters
4. Repeat to create additional polygons.
5. Click **Close** to exit window

To Edit a "created" circle see page 34
To edit a circle:
1. Close all tool windows
2. Select a circle
3. Open Circle tool (With a circle selected the Circle tool opens as the Edit Circle tool)
4. Edit Center point and Radius as needed
5. Click Apply to save changes and close window.
8.9 Create Arc tool

There are two primary ways to create an arc

Option 1 – Center, Start and End

1. Select Center, Start and End
2. Enter XY Center Point
3. Enter Radius
4. Enter Start Angle
5. Enter End Angle OR Sweep Angle (Entering one of these will auto-fill the other)
6. Click Create to apply arc settings
7. Repeat to create additional arcs.
8. Click Close to exit Create Arc window

To edit an arc see page 37
Create Arc tool (cont.)

Option 2 – Center, Start and End

1. Select Through Three Points
2. Enter XY Start Point
3. Enter XY End Point
4. Radius auto-fills and is not editable
5. Click Create to apply arc settings
6. Repeat to create additional arcs
7. Click Close to exit Create Arc window

To edit an arc see page 37.
8.10 Edit Arc tool

To edit an arc:
1. Close all tool windows
2. Select an arc
3. Open Arc tool (With an arc selected the Arc tool opens as the Edit Arc tool)
4. Edit selected arc as needed (End Angle and Sweep Angle override each other)
5. Click Apply to save changes and close Edit Arc window.
8.11 Create Ellipse tool

The Create Ellipse tool can be used to create a full ellipse (below) or a partial ellipse (page x).

Create full ellipse

1. Enter XY Center Point
2. Enter Horizontal Axis (X dimension)
3. Enter Vertical Axis (Y dimension)
4. Enter Rotation (Positive number rotates ellipse counterclockwise)
5. Click Create to apply ellipse settings
6. Repeat to create additional ellipses
7. Click Close to exit Create Ellipse window

To edit an ellipse see page 40
Create Ellipse tool (cont.)

Create partial ellipse

1. Select **Partial** checkbox
2. Enter XY **Center Point**
3. Enter **Horizontal Axis** (X dimension)
4. Enter **Vertical Axis** (Y dimension)
5. Enter **Rotation** (Positive number rotates counterclockwise)
6. Enter **Start Angle**
7. Enter **End Angle** or **Sweep Angle**
8. Click **Create** to apply partial ellipse settings
9. Repeat to create additional ellipses
10. Click **Close** to exit **Create Ellipse** window

To edit an ellipse see page 40.
8.12 Edit Ellipse tool

To edit an ellipse:
1. Close all tool windows
2. Select a full or partial ellipse
3. Open Ellipse tool (With an ellipse selected the Ellipse tool opens as the Edit Ellipse tool)
4. Edit the selected ellipse as needed.
5. Click Apply to save changes and close Edit Ellipse window.
8.13 Create Text tool

To create text:
1. Deselect all objects in the workspace area
2. Click on Text tool to open the Create Text tool
3. Enter Text
4. Select Font
5. Enter XY Position point
6. Enter desired Height
7. Set Rotation as needed
8. Press TAB key to preview changes
9. Click Create to apply changes
10. Repeat steps to add more text
11. Click Close to exist window.

To edit existing text use Edit Text tool see page 42. or Edit Text Spacing tool see page 43.
8.14 Edit Text tool

To edit a text:
1. Close all tool windows
2. Select a text
3. Open Text tool (With text selected it will opens as the Edit Text tool)
4. Edit the selected text as needed.
5. Click Apply to apply changes and close Edit Text window
8.15 Text Spacing tool

How to DECREASE text spacing

1. Click on Text Spacing tool to activate tool. Icon for active tool glows blue.

2. Click on the letter that is left of the space that you want to decrease.

To deactivate the Text Spacing tool, click on tool or press Space Bar
How to INCREASE text spacing

1. Click on Text Spacing tool to activate tool. Icon for active tool glows blue.

2. To increase spacing, hold down SHIFT key while clicking on the letter that is left of the space you want to increase.

To deactivate the Text Spacing tool, click on tool or press Space Bar
8.16 Offset tool

To create offset:
1. Click on Offset tool icon to open the Create Offset tool window
2. Select shape to offset
3. Set Step Size (offset distance)
4. Enter Number of Steps
5. Press TAB key to preview offset
6. Click Create to accept offset
7. Repeat steps as needed.
8. Click Close to exit Create Offset window.

NOTE: Single line segments cannot be offset using the Offset tool. To offset a single line segment use the Copy, Paste and Move Groups tools.
8.17 join tool

To create offset:
1. Open Join Shapes tool window
2. Enter Tolerance amount
3. Select first line segment
4. Hold down SHIFT key
5. Select second line segment
6. Release SHIFT key
7. Click Join
8. Click Close to exit Join Shapes window.
8.18 Fillet tool

With the Fillet tool you can fillet one corner at a time or all at once.

**Single Corner Fillet**
(see page 48)

**Fillet All Corners**
(see page 49)
SINGLE corner fillet

To create single corner fillet:
1. Open **Fillet** tool window
2. Enter **Radius** amount
3. Press **TAB** key to accept radius amount
4. Activate **Select Corner** (By default, the Select Corner button is active)
5. Click a corner
6. Fillet preview appears as a dotted line
7. Click **Create** to apply fillet
8. Repeat as needed
9. Click **Close** to exit
To fillet all corners:
1. Open Fillet tool window
2. Enter Radius amount
3. Press TAB key to accept radius amount
4. Turn off Select Corner button. When turned off it has a white background
5. Click a corner
6. Fillet preview appears as a dotted line at all corners
7. Click Create to apply fillet
8. Click Close to exit
The **Trace Image** tool creates vectors lines from the following types of non-vector based image files: `.png`, `.jpg`, `.jpeg`, and `.bmp`. The **Trace Image** tools offers three methods of tracing an image. See the pages listed above for instructions on how-to use each method.
Trace by Color

Step 1  Create a layer for the traced vectors. (See page 66 for information on creating new layers.)

Step 2  Use the **Import Image** tool to import an image. Importing an image will auto-create an "Image" layer for imported images.
Trace by Color (cont.)

**Step 3** Use the **move layer arrows** to move the **Image trace vectors** layer to the top of the list. This will make the lines in this layer appear on top of the image, and make them easier to view and manage. Then click on the "Image traced vectors" layer to make it active. (An active layer has bold blue text with a gray background.)

**Step 4** Open the **Traced image** tool window
Trace by Color (cont.)

Step 5  Select Color from the list of trace options.
Step 6  Select the image that you want trace.
Step 7  Move the Number of Colors slider until the desired number of colors is showing.
Step 8  Select the color(s) for the areas you wish to trace (black and gray this case)
Step 9  Click Create to create vectors around the selected colors
Step 10 Click Close to exit window

TIP: Typically a low numbers of colors works best

Step 11 Turn off the visibility of the Image layer by clicking on the eye icon for that layer. Color tracing may also create a boarder vector. It can be deleted or edited as needed.
Step 12 You can now edit the design and create toolpaths from these vectors.
Trace Background

Step 1 Create a layer for the traced vectors
(See page 66 for information on how to create new layers.)

Import Image tool

Step 2 Use the Import Image tool to import an image.

Importing an image will auto-create an "Image" layer. Imported images will automatically be placed on this layer.
Trace Background (cont.)

**Step 3** Use the **move layer arrows** to move the **Image trace vectors** layer to the top of the list. This will make the lines in this layer appear on top of the image, and make them easier to view and manage. Then click on the "Image traced vectors" layer to make it active. (An active layer has bold blue text with a gray background.)

**Step 4** Open the **Traced image** tool window
Trace Background (cont.)

**Step 5** Select **Background** from the list of trace options.

**Step 6** Select the image that you want trace.

**Step 7** Wait for a red line to appear around the object.

**Step 8** After the red line appears around the object, click **Create** to create vector.

**Step 9** **Close** to exit window.

**Step 11** Turn off the visibility of the **Image** layer by clicking on the **eye** icon for that layer.

**Step 12** You can now edit the design and create toolpaths from these vectors.
Trace Outline

**Step 1** Create a layer for the traced vectors. (See page 66 for information on creating layers.)

**Step 2** Use the **Import Image** tool to import an image. Importing an image will auto-create an **Image** layer for imported images.

**Step 3** Use the **move layer arrows** to move the **Image trace vectors** layer to the top of the list. This will make the lines in this layers appear on top of the image, and make them easier to view and manage. Then click on the **Image traced vectors** layer to make it active. (An active layer has bold blue text with a gray background.)
Trace Outline (cont.)

Step 4 Open the **Traced image** tool window
Step 5 Select **Outline** from the list of trace options.
Step 6 Select the image that you want trace.
Step 7 Click **Create** to create vector
Step 8 Close to exit window

Step 9 Turn off the visibility of the **Image** layer by clicking on the **eye** icon for that layer.
Step 10 Edit and toolpath the vectors as needed.

The trace **Outline** option simply traces the outline of the selected image. This is useful when you want to create a boarder vector around your color or background traced image.
8.20 Array Copy tool

To create an Array Copy:
1. Open **Array Copy** tool window
2. Select vector to copy
3. Enter **XY Gap** dimensions
4. Enter **Gap Type**
5. Enter number of **Columns** and **Rows**
6. Preview of copies appear as dotted lines.
7. Click **Create** to apply settings
8. Click **Close** to exit window

**Invert Columns** copies vectors to the left
**Invert Rows** copies vectors down
To create an Circular Copy:
1. Open Circular Copy tool window
2. Select vector to copy
3. Enter XY Center point or use Set Circle Center button
4. Enter Radius for circular copies
5. Enter number of Shapes (total copies) to create OR Angle Between shapes
6. Set Start angle
7. Set Clockwise or Counterclockwise copy
8. Preview of copies appear as dotted lines
9. Click Create to apply settings
10. Click Close to exit window

Maintain Rotation – Checking this box will create copies that maintain the same orientation as the original vector shape. Unchecking this box allows the copies to rotate along the circular vector (as shown above).
Section 9 - Toolpaths overview

The Toolpaths tool allows you to create and manage three types of laser toolpaths.

Selected Toolpath – A selected toolpath has bold blue text and gray background. Select toolpaths can be deleted, edited, duplicated or moved up or down in the list.

Save Checkbox – Toolpaths with the checkbox checked are postprocessed and saved using the save button.

Post Processor – Select the post processor for the tool that you plan to use to run the toolpaths.

Save Button – Saves checked toolpaths to computer or USB flash drive. See page 62 for more info.
Saving Toolpaths

**Step 1**
Check box(s) next to the toolpath(s) you want to Save and run on your machine.

**Step 2**
Select the Post Processor for your machine.

**Step 3**
Save to toolpaths to your computer or USB drive.
9.1 Vector Toolpath

The Vector Toolpath burns on the selected vector line.

- Results will vary your choice of speed, power and material.
- Light materials tend to reflect the laser light and require a slower speed and higher power settings.
- Darker materials absorb the laser light and may require a higher speed and lower power setting.

Run some tests to find a speed and power combination that works best for your material.
9.1a Vector Toolpath workflow

NOTE: Not all of the following steps are required for every file or setup and some may need to be modified depending on your particular project. It's important to run some tests to find the toolpath settings that works best with your material and design. Refer to the pages below for detailed information on each step.

1. Create new project workspace (see page 13)
2. Create desired vectors using Create tools (page 23)
3. Edit vectors as needed using Edit tools (page 16) and/or Transform tools (pages 19)
4. Open Toolpaths tool (page 61)
5. Open Vector toolpath window (page 61)
6. Select vector(s) (page 63)
7. Set Speed and Laser Power (page 63)
8. Name toolpath (page 63)
9. Click Calculate (page 63)
10. Press save icon (page 62)
11. Save file to a USB drive.
12. Insert the USB drive into the port on the front of your Moray laser.
9.2 Fill Toolpath

The Fill Toolpath fills the center of a selected vector with a single or cross hatch pattern. The outline vector can also be burned.  
- Results will vary your choice of speed, power and material.  
- Light materials tend to reflect the laser light and require a slower speed and higher power settings.  
- Darker materials absorb the laser light and may require a higher speed and lower power setting.  

Run some tests to find a speed and power combination that works best for your material.

Note: the Gutter feature (if showing) is not currently an active feature and can be ignored.
9.2a Fill Toolpath workflow

NOTE: Not all of the following steps are required for every file or setup and some may need to be modified depending on your particular project. It's important to run some tests to find the toolpath settings that works best with your material and design. Refer to the pages below for detailed information on each step.

1. Create new project workspace (see page 13)
2. Create desired vectors using Create tools (page 23)
3. Edit vectors as needed using Edit tools (page 16) and/or Transform tools (pages 19)
4. Open Toolpaths tool (page 61)
5. Open Fill toolpath window (page 61)
6. Select vector(s) (page 65)
7. Set Speed and Laser Power (page 65)
8. Set Stepover (the space between hatch lines (page 65)
9. Set Hatch Angle (page 65)
10. The Gutter setting can be ignored as it is not currently an active function.
11. Name toolpath (page 65)
12. Click Calculate (page 65)
13. Press save icon (page 62)
14. Save file to a USB drive.
15. insert the USB drive into the port on the front of your Moray laser.
9.3 Dither Toolpath

The Dither Toolpath converts an imported image to dither points to create a black and white burned image.

- Results will vary your choice of speed, power and material.
- Light materials tend to reflect the laser light and require a slower speed and higher power settings.
- Darker materials absorb the laser light and may require a higher speed and lower power setting.

Run some tests to find a speed and power combination that works best for your material.

A "selected" image has a red boarder

Image size - 3" x 4.5"
Burn time about 30 minutes
Speed 100
Power 100
DPI 50
Material – light softwood plywood
9.3a Dither Toolpath workflow

NOTE: Not all of the following steps are required for every file or setup and some may need to be modified depending on your particular project. It's important to run some tests to find the toolpath settings that works best with your material and design. Refer to the pages below for detailed information on each step.

1. Create new project workspace (see page 13)
2. Load image (see page 15)
3. Scale image to desired size (pages 19,20)
4. Move image to desired location in workspace (pages 19,20)
5. Open Toolpaths tool (page 61)
6. Open Dither (raster) toolpath window (page 61)
7. Select image (page 65)
8. Set speed, power, dpi (page 65)
9. Name toolpath (page 65)
10. Click Calculate (page 65)
11. Press save icon (page 62)
12. Save file to a USB drive.
13. Insert the USB drive into the port on the front of your Moray laser.
Section 10 – Layers Tool

The Layers tool enables you to add, delete and manage vectors and images on different layers. Layers can be visible or hidden. New vectors will always be placed on the Active layer – even if it is hidden.

"Select across layers" option. Objects on any visible layer can be selected.

Only objects on the active layer can be selected.

Add New Layer

Move layer up or down in the list.

Right-click on layer for dropdown menu

Active and visible layer

Visible layer

Hidden layer
Section 10 – Dropdown Menus

The drop-down menus at the top of the workspace window includes many of the same functions as the tool icon pallets, plus a few extras.
Section 12 – Default Settings

The Settings window allows you to set the default values for several tool functions.

The Settings window is opened by clicking on the gear icon in the upper right corner of the workspace or from the File dropdown menu.

The Settings window has a submenu that provides access to four groups of default settings.

See page 72
See page 73
See page 74
See page 75
See page 75

Setting can also be imported, exported and reset.
12.1 General Settings

View Scrollbars – Checked by default. Toggles Scrollbars on and off.

Select Across Layers – Checked by default. Allows user to select objects from any visible layer.

Snap to Key Points – Checked by default. Key points include object corners, line ends and intersection points on grid (when grid is visible)

Create Vectors on Placement – Checked by default. Vectors are created upon the final mouse click when drawing lines, rectangles, polygons, circles, arcs, ellipses and text. Overrides the need to click on the Create button in object create windows.

Auto Close After Create – Unchecked by default. When checked, create windows auto-close when the Create button is clicked. Windows also auto-close when objects are created using the Create Vectors on Placement setting above.

Minimal UI – Unchecked by default. When checked, several of the design tool icons are hidden.

Always on Top – Unchecked by default. When checked the R2D-LE workspace window will always be on top of other open window.

Enable Transparency – Unchecked by default. When checked, you can control the Transparency Amount (brightness) of the R2D-LE workspace window.

Always Transparent – Unselected by default. R2D-LE window will always display the Transparency Amount set by the slider

Transparent when Inactive – Selected by default. R2D-LE window will display the Transparency Amount set by the slider, only when the R2D-LE window is inactive (e.g. another window is active)
12.2 Default Workspace Settings

The preset that you select in the dropdown window become the default when a new workspace is created (page 13).

The only dimensions that are editable are those for the Custom Dimensions setting.

The Anchor Point and Anchor Position settings apply to all of the Preset Dimensions.

Resets this window to it's defaults settings.
12.3 Toolpath default settings

Post Processor – Sets default post processor for toolpaths.
Use IJ Method for curves – Not active in R2D-LE
CW CCW – Select preference. Software default is CW

All
Speed – System default is 120 IPM. Adjust to your preference.
Laser Power – System default is 100 %. Adjust to your preference

Image
Image DPI – Dot Per Inch setting for Image laser toolpath. System default is 0 dpi. Recommended setting is 150-300 dpi for most image.

Fill
Stepover – System default is .05 inches. Adjust to your preference.
Hatch Angle – System default is 45 degrees. Adjust to your preference.
Gutter – Distance the hatch lines offsets from from the entity’s outline. System default is .125 inches. Adjust to your preference.
Cross Hatch – When check toolpath creates a second Hatch pattern opposite the first.
Burn Entity Outline – When check toolpath burns the outline of the Fill shape.

Router Toolpath Defaults
Does not apply to R2D-LE
12.4 Default Join Settings

Sets the default tolerance for the Join Tool.
(See page 46 for information on using the Join tool).

12.5 Registration/Account Sign-in

Allows you to access your account directly from the software for updates and account management.
Section 13 – Resources

Next Wave Automation
www.nextwaveautomation.com
Manufacturer of the CNC Shark HD4, Piranha CNC, Moray Laser and CNC accessories. The website has software and documentation downloads as well as other general product information.

NWA Owners Only Forum
https://forums.nextwaveautomation.com/
A user group of the CNC users geared around CNC Shark owners. The website has projects, ideas, showcase, and valuable support from users of all levels.

CNC Shark Talk User Forum
www.cncsharktalk.com
CNC forum open to all CNC users.

Vectric
www.vectric.com
Producers of the VCarve and Aspire software package. The Vectric website has product information, FAQs, on-line tutorials, and an excellent user forum. Keep in mind that Vectric supports Vectric software, not the CNC Shark.

Design & Make
http://www.designandmake.com/
Vendors of CNC-ready, VCarve and Aspire compatible three-dimensional clip-art models. Purchase models individually or in collections; a huge number of models is available.
Version change log
March 22 – first final version published to web
March 27 – Added Toolpath workflow sections 9.1a, 9.2a, 9.3a. Corrected some typos, and updated pagination in TOC and call-out references. Published new "March 2019 v2" to web.