

# **Lightwave DigiScribe**

**Version 1.0**

## **User Guide**

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**Jeff Smith**

**Retinal Reality**

Retinal Reality Animation Studios  
1900 Wyatt Dr. Suite 2  
Santa Clara, CA 95054  
Email: [support@retinalreality.com](mailto:support@retinalreality.com)  
Tel: 408.970.8015

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# 1 Getting Started

## About DigiScribe

DigiScribe is a plugin for Lightwave Modeler which connects to the Immersion Microscribe 3-D, giving animators a fast and easy way to translate irregular, organic and odd-shaped objects from the real world directly into Lightwave. At the touch of a button, 3-D polygons, surfaces, primitives, points and curves are translated into Lightwave simply by tracing the Microscribe over real objects. DigiScribe launches directly from Lightwave Modeler allowing animators to move back and forth between generating geometry with the Microscribe and using all of Lightwave's powerful and familiar modeling tools.

DigiScribe is simple to load and appears as the "DigiScribe" function under the Lightwave Modeler Additional menu. It is currently available for Lightwave 6.0, 6.5, 6.5b, 7.0, and 7.0b running on the PC under Windows 2000. A Demo version of the plugin is available at [RetinalReality.com](http://RetinalReality.com). To obtain a license for a full version, contact Retinal Reality Animation Studios for more information at Tel: 408.970.8015 or by email to: [support@retinalreality.com](mailto:support@retinalreality.com) or the old-fashioned way: 1900 Wyatt Dr. Suite 2, Santa Clara, CA 95054.

## Installation

1. Make sure the Microscribe-3D is correctly attached to the computer and turned on.
2. Copy the *DigiScribe.p* file into the directory:  
*C:\LightWave\Plugins\Modeler*
3. If you plan to run DigiScribe in Demo mode, then skip to step 6.
4. If you do not have a license but would like to obtain one, call Retinal Reality (408)-970-8015, or email [support@retinalreality.com](mailto:support@retinalreality.com). Have your Microscribe-3D serial number ready. If you don't know your serial number, then go to step 6 and finish installing DigiScribe. It will run in Demo Mode and display your Microscribe-3D serial number for you.
5. If you already have a license number for DigiScribe, then create a text file named *DigiScribe.key*. Put the license number supplied to you by Retinal Reality on the first line of the *DigiScribe.key* file. It should be the only text in the file. Save this *DigiScribe.key* file in

one of the following locations where DigiScribe looks for its license:

C:

C:\Lightwave

The content directory for *Lightwave Modeler*

The plugin directory for *Lightwave Modeler*

6. Now start *Lightwave Modeler*.
7. Under the *Modeler->Plugins* submenu, select the *add Plugins...* feature.
8. Brows to the *Lightwave\Plugins\Modeler* directory and select the *DigiScribe.p* plugin file. Note: if you do not find *DigiScribe.p* in that directory, then brows to the directory where you find the plugin and select it.
9. Select the *done* option on the *Add Plugins* window.

DigiScribe is now installed and ready to use!

## Quick DigiScribe Tutorial

You've installed DigiScribe; it's time to input geometry. If you're running DigiScribe for the first time, follow steps in the "First Time" section. Otherwise, skip to the "Entering Points" section beginning with step 6 below

### First Time

1. Place the "Quick DigiScribe Tutorial Geometry" page (Figure 4 of this Guide) on the table in front of your MicroScribe 3-D and fix it in place with tape. **NOTE:** If the object moves while you are tracing surfaces, they will not align properly creating a disjointed geometry. Tape works well for the paper you will use in this tutorial but sticky tac is great for fixing objects you'll want to digitize.
2. In Lightwave, start the DigiScribe plugin by selecting it from the *Additional* submenu of the *Construct* tab. Note: if the MicroScribe 3-D device is not on or not connected to your computer, a message will appear stating that "MicroScribe 3-D cannot be found." If this happens, make sure the MicroScribe 3-D is turned on and plugged in. If not, turn it on and plug it in, then try again.

3. If you do not have a license, DigiScribe will generate a Demo license and run in Demo Mode. Alert windows will notify you of this. Click "ok" to continue.
4. If you have a license or you have just changed from a Demo license to a permanent license. The first time it runs, DigiScribe will create a new *DigiScribePrefs.txt* file in the Lightwave content directory (by default, Lightwave sets this directory to *C:\Lightwave*). An info message will appear stating:

"No DigiScribePrefs.txt File Found."  
"Creating Default DigiScribePrefs.txt file."

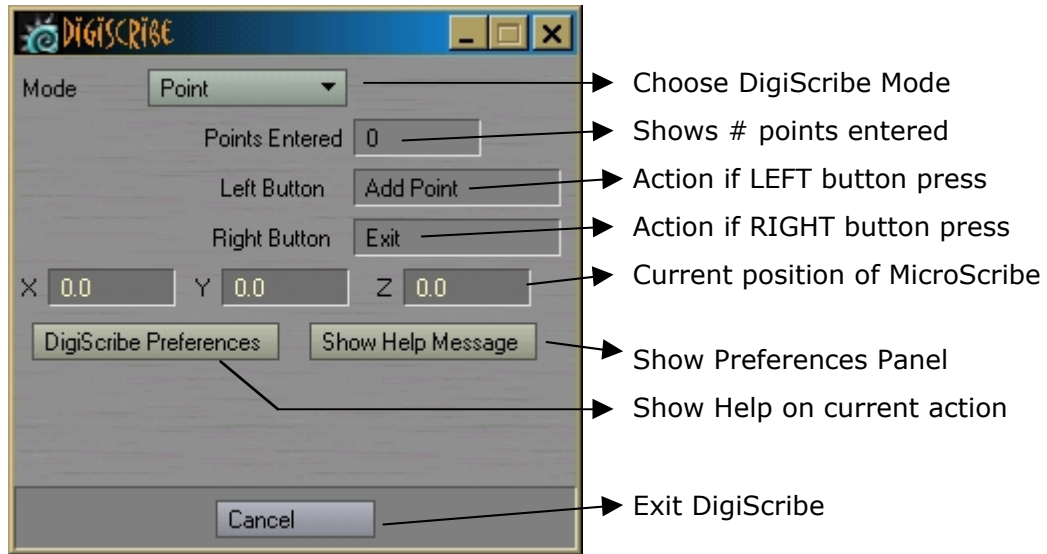
This file contains data values for preferences such as the number of segments and sides of primitive objects created by the Microscribe-3D. You will not need to modify this file directly, DigiScribe will do it for you when you change its preferences.

5. If running in Demo Mode, DigiScribe will display credits information. It will also notify the user when the demo license expires and display the Microscribe-3D serial number. Click "ok" to continue. Note: to streamline the process of digitizing objects, these windows will not appear if you are using a fully licensed version of DigiScribe.

### Entering Points

6. DigiScribe begins by looking for the MicroScribe 3-D and connecting if one is found. A tone will sound when DigiScribe is connected to the MicroScribe and ready to record geometry. NOTE: if your MicroScribe 3-D is not connected to COMM port 1 or 2, then you will have to enter the COMM port each time you run DigiScribe. A Dialogue box will appear asking for this information. If you plan to use DigiScribe a lot, it is preferable to attach the MicroScribe to COMM 1 or COMM 2 to avoid this step.
7. If you are running in Demo mode, credits will be displayed and the MicroScribe 3-D serial number will be shown. Click "ok" to close these windows and continue. Note: if you are running a fully licensed version of DigiScribe, these windows will not automatically be displayed. This considerably streamlines the process of digitizing objects.
8. DigiScribe is now running in Point Mode and ready to input points. A panel shows the mode, position of the MicroScribe, and number of points entered (see Figure 1).
9. Move the tip of the Microscribe-3D to the polygon vertex labeled "1" on the Quick DigiScribe Tutorial Geometry page.

**Figure 1: DigiScribe Main Panel**



- 10.** Click the LEFT foot pedal to enter a point. A tone will sound to indicate that the point has been entered. Notice that the value for "Points Entered" has gone from zero to one.
- 11.** Click the LEFT foot pedal on the other two vertices of the triangle to enter points at those locations.
- 12.** The points have not yet been drawn in Lightwave. To do this, click the RIGHT foot pedal. The points will appear in your Lightwave Modeler window. **If you don't see the points, they are outside the viewing area in Modeler.** Exit DigiScribe by pressing the "Cancel" button at the bottom of the DigiScribe Main Panel (or hit the RIGHT foot pedal a second time) and use the Lightwave zoom controls to find the points you have just entered.

CONGRATULATIONS!

You've just input your first geometry with DigiScribe

- 13.** Now, start DigiScribe again (Step 2 above) and bring up the DigiScribe Main Panel again (Figure 1 above).

#### Input a Triangle

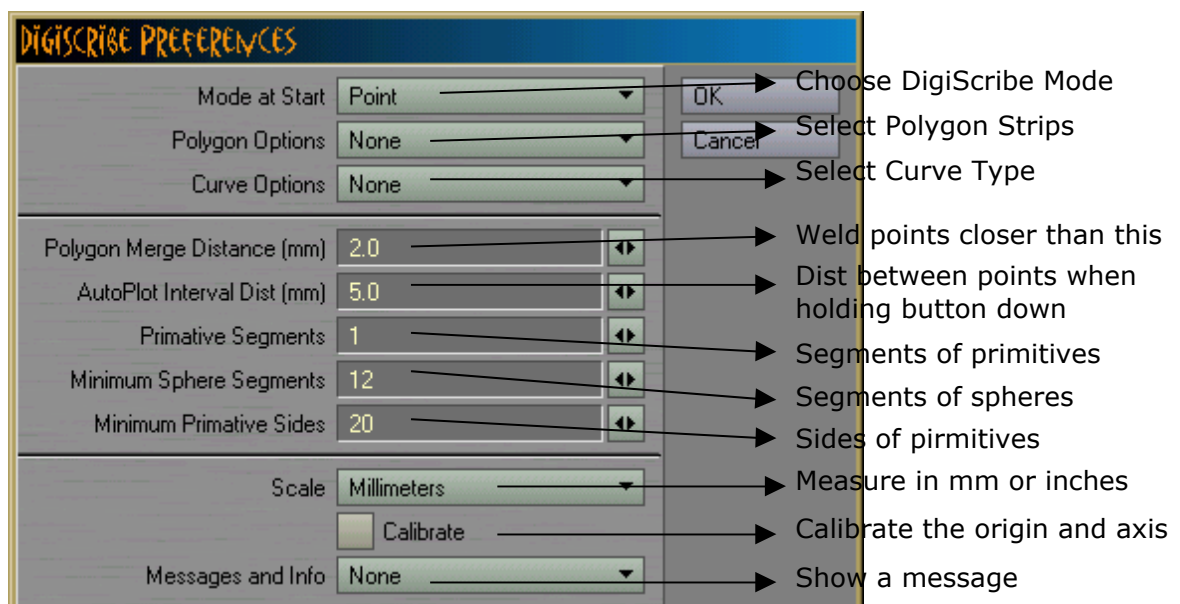
- 14.** Select "Polygon" in the "Mode" pop-up menu on the DigiScribe Main panel (Figure 1). This changes the mode DigiScribe is running in from simply entering points to entering polygon geometry.

15. Move the tip of the Microscribe-3D to the polygon vertex labeled "1" on the Quick DigiScribe Tutorial Geometry page. Click the LEFT foot pedal to enter a point at that vertex.
16. Continue around the triangle in a counter-clockwise direction, clicking the LEFT foot pedal once to enter vertex 2 and vertex 3 of the triangle. **NOTE:** Moving in a counter-clockwise direction creates a polygon with the normal pointing upward, out of the page. Going in a clockwise direction would simply create a polygon with the normal pointing down into the page.
17. After vertex 3 is entered, click the RIGHT foot pedal. A tone will sound, and the geometry will be drawn in Lightwave Modeler. If you cannot see it, exit DigiScribe by closing the DigiScribe Main Panel and try changing the scale in your Modeler view or select the "view all" feature in Modeler.
18. If you exited DigiScribe, you will have to restart (step 2) and return to the DigiScribe Main Panel (Figure 1) before moving on to the next step. **HELPFUL HINT:** before you get tired of using the mouse to start DigiScribe, create a Lightwave shortcut key for it. If you didn't exit, you can continue to enter more geometry.

### Input a Triangle Strip and a Quad Strip

19. Make sure the "Polygon" mode is selected in the DigiScribe Main Panel and that the "Points Entered" window shows zero.
20. Now, click on the "DigiScribe Preferences" button to bring up the DigiScribe Preferences Panel (Figure 2).

**Figure 2: DigiScribe Preferences Panel**



- 21.** Select the "Zigzag Triple Strip" option in the "Polygon Options" pulldown menu on the Preferences Panel. This preference tells DigiScribe to create a strip of adjoining triangles with a zigzag pattern when in polygon mode. Click "OK" to go back to the DigiScribe Main Panel.
- 22.** NOTE: if you are running in Demo Mode a message will be displayed indicating that this mode does not support preference changes. You can still follow this tutorial and create a single, multisided polygon.
- 23.** Enter the triangle strip geometry on the Quick DigiScribe Tutorial Geometry page. Enter each vertex by placing the tip of the Microscribe on the point and clicking the LEFT foot pedal. A tone will sound each time a point is entered and you will see the number of points entered change in the DigiScribe Main Panel. Continue in a counter-clockwise direction until all 9 points are entered, then click the RIGHT foot pedal. This will draw the geometry in Lightwave Modeler. **NOTE:** if you are in demo mode, a single polygon will appear. If you are running a licensed version of DigiScribe, you should see the zigzag polygon strip as it appears on the Quick DigiScribe Tutorial Geometry page.
- 24.** Enter the quad strip by returning to the DigiScribe Preferences Panel (Figure 2) and selecting the "Quad Strip" option in the "Polygon Options" pulldown menu. Enter geometry following the same procedure as for the triangle strip (step 23 above). **NOTE:** if you are in demo mode, a single polygon will appear.
- 25.** At this point you may wish to exit DigiScribe to modify or view your quad and triple strip using Lightwave Modeler.

### Input Primitives

- 26.** Start DigiScribe (Step 2) and/or get to the DigiScribe Main Panel (Figure 1). In order to input primitives, select the "Primitive" mode in the "Mode" pulldown menu on the DigiScribe Main Panel.
- 27.** There are six primitive geometries that may be entered. Depress the LEFT foot pedal to enter each of the points that define the primitive. The number of points entered defines the type of primitive object that will be created:
  1. POINT: Just a point.
  2. BOX: Opposite top and bottom corners of a box.
  3. CIRCLE: three points on the circumference of a circle.

4. CONE: three points on the circumference of the base of the cone. The fourth point is the tip of the cone.
  5. SPHERE: three points on the surface of the sphere. Points 4 and 5 simply define the sphere primitive object over the circle primitive object.
  6. CYLINDER: three points on the bottom circumference of the cylinder followed by three points on the top circumference of the cylinder.
- 28.** Try entering the 2 Point Box shown on the Quick DigiScribe Tutorial Geometry page. After entering the two points, depress the RIGHT foot pedal to generate the primitive object from the given points. **NOTE:** when the 2 Point Box is in a plane as on the Tutorial, a quad is generated. To make a box, enter the first point on the page and lift the tip of the MicroScribe 3-D above the page to enter the second point.
  - 29.** After a primitive geometry is entered, you may continue to enter more primitives or exit to manipulate those geometries in Lightwave.
  - 30.** Try entering the 3 Point Circle and the 5 Point Sphere shown on the Quick DigiScribe Tutorial Geometry page. As with the 2 Point box, enter points by clicking on the LEFT foot pedal and then click the RIGHT foot pedal to finish the primitive. **NOTE:** If you exited DigiScribe after entering the box, don't forget to select the "Primitive" mode in the "Mode" pulldown menu on the DigiScribe Main Panel. If running in Demo Mode you will have to select this each time you start DigiScribe. With a full license, DigiScribe remembers the mode you were in last time you used DigiScribe so you will not have to change this every time you start the plugin.
  - 31.** Try entering the other primitive objects or exit DigiScribe to examine or modify your primitives using all the features of Lightwave.

### Input Curves

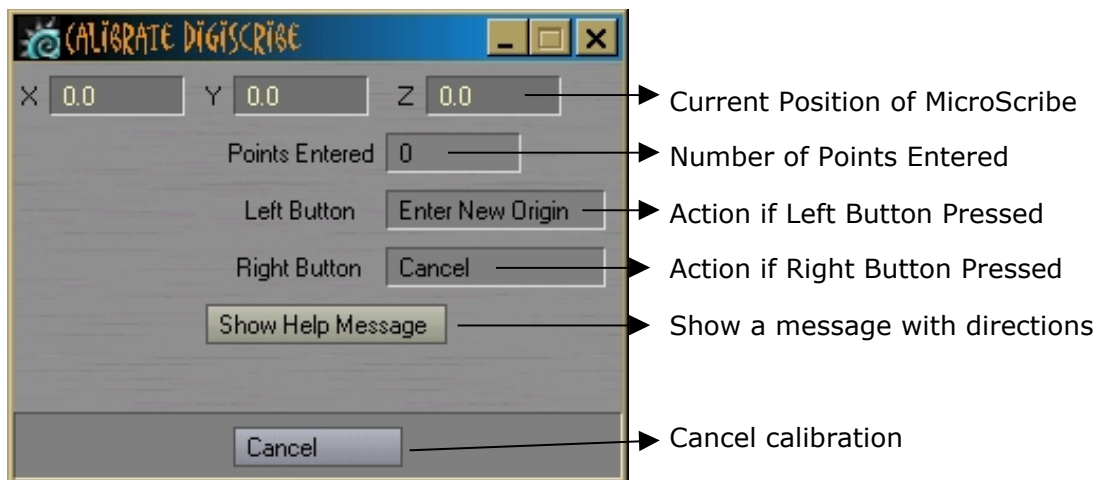
- 32.** Start DigiScribe (Step 2). After a tone sounds, DigiScribe has connected to the MicroScribe and the DigiScribe Main Panel should appear. Select the "Curve" mode in the "Mode" pulldown menu on the DigiScribe Main Panel.
- 33.** Place the tip of the MicroScribe on one end of the top curve shown on the Quick DigiScribe Tutorial Geometry Figure.
- 34.** Click and HOLD DOWN the LEFT foot pedal.

35. Trace the Microscribe along the curve. Points will be added at a pre-specified distance along the curve. **NOTE:** the default distance is 5 mm. It is one of the preferences and (unless you are running in Demo Mode) it can be changed by changing the "Autoplot Interval Distance" in the DigiScribe Preferences Panel.
36. At the end of the curve, lift the LEFT foot pedal and click the RIGHT foot pedal to finish the curve and draw the geometry.
37. To exit and view your geometry, click "cancel" or press the RIGHT foot pedal a second time. To enter another curve, simply repeat from Step 33 above.

### Calibrate Origin and Axis for DigiScribe

38. To calibrate DigiScribe, start the plugin (if not already started) and get to the DigiScribe Main Panel (Figure 1). **Note:** calibrating the origin and axis DigiScribe uses when it inputs points allows you to align objects with the Lightwave Modeler environment. This is especially useful for DigiScribe's advanced features but it will be covered in the basics because it is so important.
39. Go to the DigiScribe Preferences Panel by clicking on the "preferences" button in the DigiScribe Main Panel. The Preferences Panel (Figure 2) will be displayed.
40. Select the "Calibrate" checkbox on the DigiScribe Preferences Panel, then click "ok" to continue.
41. The DigiScribe Calibration Panel will appear (Figure 3). This panel is similar to the DigiScribe Main Panel but only allows the user to enter two points to calibrate the origin and axis for the DigiScribe.

**Figure 3: DigiScribe Calibration Panel**

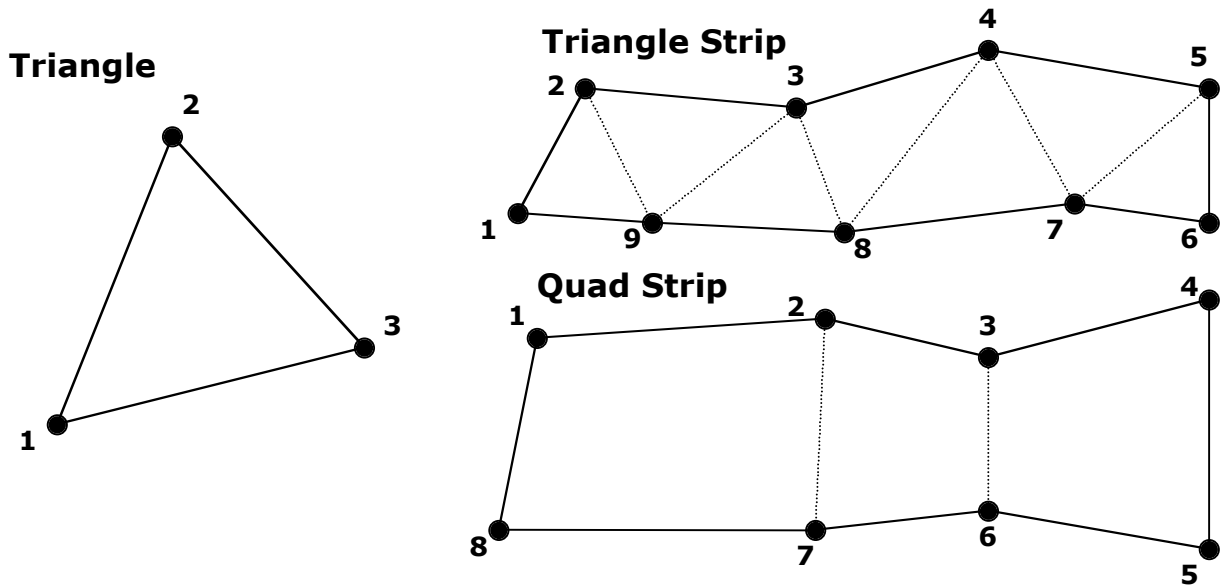


- 42.** Enter the new origin by moving the MicroScribe 3D to a point where you want the origin to be. Click the LEFT foot pedal to enter the new origin. **NOTE:** the message in the "Left Button" window of the Calibration Panel will change to let you know you're ready to add the next calibration point.
- 43.** Enter a point on the positive X axis; the farther this point is from the origin, the more accurate the calibration will be. This aligns the rotation of the XZ plane (the plane parallel to the tabletop). **NOTE:** the Y axis is always in the vertical direction.
- 44.** If two points have been entered, DigiScribe will immediately exit the Calibrate Panel and go back to the DigiScribe Preferences Panel. Click "OK" to accept the new calibration origin and axis. That's it. Any new geometry entered will be aligned with this new origin and axis.

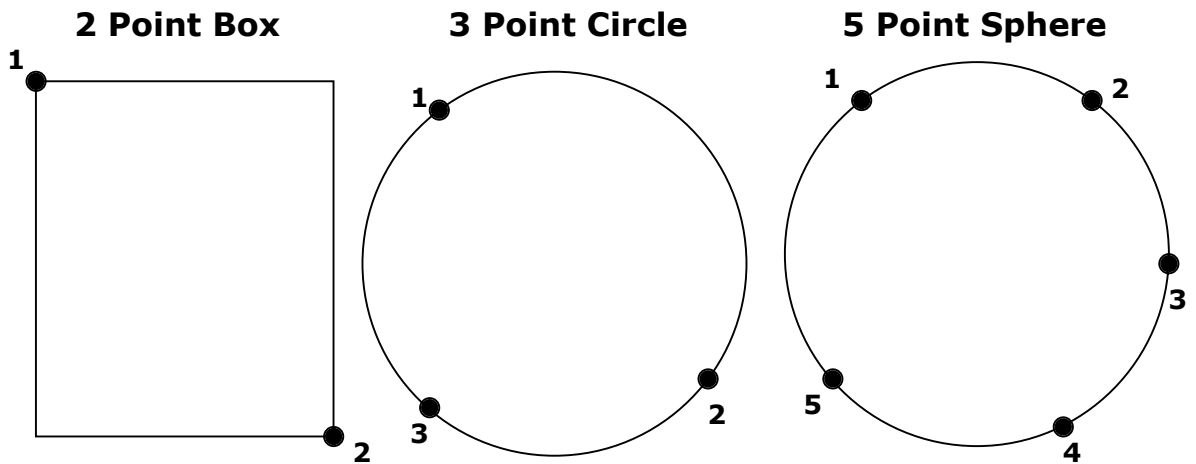
Now you have completed the DigiScribe Quick Tutorial. All the basic features of entering geometry through DigiScribe have been covered. Later sections of this Guide describe all the features of DigiScribe in greater detail and also cover many tips on how to make accurate 3-D geometries quickly from real objects. Enjoy!

Figure 4: Quick DigiScribe Tutorial Geometry

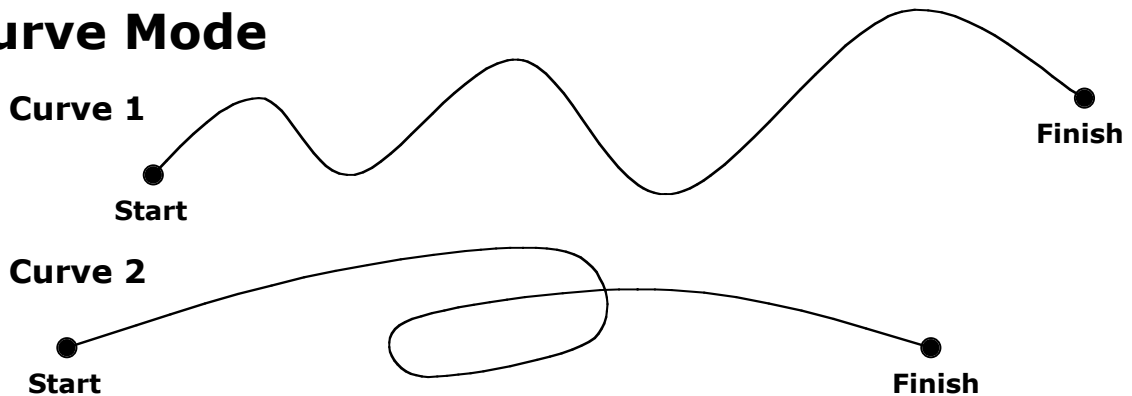
## Points and Polygon Mode



## Primitive Mode



## Curve Mode



## **2 DigiScribe Software Features**

DigiScribe has a number of features designed to integrate Lightwave with the MicroScribe 3-D. With DigiScribe, a user can enter points, polygons, primitives and curves into Lightwave quickly and easily just by tracing the MicroScribe 3-D over a surface or by entering vertices of polygons or primitives as points. The main features of DigiScribe are included in four modes of operation. A set of preferences and settings are used for many of these features and (when the plugin is not running in Demo Mode) these preferences are accessible to the user and can be changed to meet a variety of needs.

### **License Key**

DigiScribe requires a license key in order to run. There are three types of licenses: Demo, Test, and Full. All license keys take the same format and must be located in a file called *DigiScribe.key* and must be located in the content directory of your Lightwave software or in the *C:* or *C:Lightwave* directory.

Demo License: when DigiScribe runs for the first time, a Demo License is automatically created and placed in the current content directory for Lightwave. The Demo License is good for 7 days and allows the user access to all of DigiScribe's basic features. In order to access to advanced features and change preferences a Test or Full license is required.

Test License: if you would like to test and evaluate DigiScribe for more than 7 days, a 30-day test license may be obtained from Retinal Reality. The test license allows users access to all of DigiScribe's features; but only for 30 days.

In order to obtain a test license, contact Retinal Reality at (408)-970-8015, or email [support@retinalreality.com](mailto:support@retinalreality.com). Have your Microscribe-3D serial number ready. If you don't know your serial number, then install and run DigiScribe in Demo Mode. A dialogue box will appear that displays your Microscribe-3D serial number for you.

Full License: a full license allows users unlimited access to all of DigiScribe's features. After purchasing DigiScribe, a full license will be supplied to you. Replace the existing Demo or Test license with the full license and enjoy unlimited use of DigiScribe.

In order to obtain Full license, DigiScribe may be purchased from Retinal Reality at (408)-970-8015, or email [support@retinalreality.com](mailto:support@retinalreality.com). Have your

Microscribe-3D serial number ready. If you don't know your serial number, then install and run DigiScribe in Demo Mode. A dialogue box will appear that displays your Microscribe-3D serial number for you.

## Basic Usage

DigiScribe is a Lightwave plugin that acts as an interface between Lightwave and a MicroScribe 3-D device. When launched, DigiScribe takes control of Lightwave and connects to the MicroScribe 3-D device. To enter a point, click the left foot pedal of the MicroScribe. To change from one mode to the next or to finish a geometry, click the right foot pedal of the MicroScribe. For more detailed information on how to input geometry, see the quick tutorial in Chapter 1 of this Guide. When a polygon or primitive object is finished, you may exit DigiScribe and modify the geometry in Lightwave. Adding more geometry is as simple as re-launching DigiScribe. By creating a Lightwave shortcut key for DigiScribe, it is very easy to jump back and forth between adding geometry with the MicroScribe and modifying it using the full power of Lightwave.

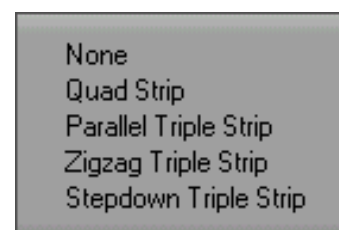
## Point Mode

The most basic type of geometry is a point, or set of points. DigiScribe creates single points and sets of points with the LEFT foot pedal of the MicroScribe. To input a single point, press the LEFT foot pedal once. To input multiple points, hold the LEFT foot pedal down and move the MicroScribe. Points are entered automatically at the "Autoplot Interval Distance" specified in the DigiScribe Preferences Panel. The default value is 5 mm between points. This value may be changed if DigiScribe is not running in Demo Mode. DigiScribe remembers this value between sessions, so if you set it once to a value you like, it will remain at that value until changed in the Preferences Panel again.



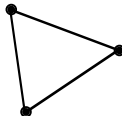
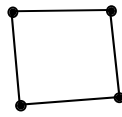
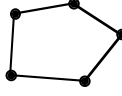
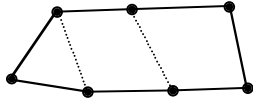
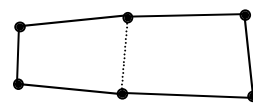
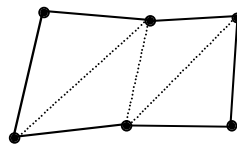
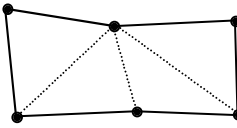
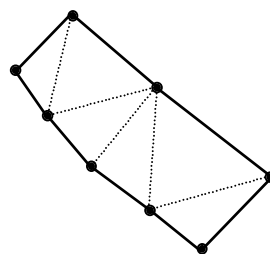
## Polygon Mode

In Polygon Mode, DigiScribe creates single polygons and polygon strips. The number of points entered and preferences set by the user (Figure 5) tell DigiScribe what kind of geometry to create. As with other DigiScribe modes, entering a polygon vertex is done by clicking the LEFT foot pedal of the MicroScribe. Finishing and drawing the object is done by clicking the RIGHT foot pedal. The types of polygons and polygon strips allowable and preference settings are outlined below.

**Figure 5: Polygon Options**



Polygon Options are selected in the DigiScribe Preferences Panel.

Preference Setting	Points Entered	Polygon Type	Notes
None	1		If a single point is entered, a single point is created.
	2		Two points entered creates a line segment.
	3		Three points entered creates a triangle. The normal is defined by Lightwave. If points are entered in a counter-clockwise direction, the normal will be pointing up with respect to the plane of the triangle.
	4		Four Points Entered creates a four-sided polygon. The quad does not need to have coplanar vertices. The normal is determined by the first three points as is done with the triangle above.
	>4		More than four points creates a multi-sided polygon when preferences are set to "None". The normal is defined by the first two and the last point entered.
Quad Strip	Odd >4		The first quad is defined by the first two points and the last two points. You MUST begin your quad strip at the end of one long side, go down that long side and then back the other side. Otherwise, odd-looking quads will be created. Quad strips may curve more than 90 degrees. If an odd number of points are entered, the first three points define a triangle at the start of the quad strip.
	Even >3		
Parallel Triple Strip	>2		This Preference creates a strip of tripled polygons. The first triple and the normals for all triples in the strip are defined by the first two points and the last point entered. The user enters points, usually in a counter-clockwise direction around the triple strip. DigiScribe fills in the cross edges in parallel. Entering an odd number of points adds a triangle at the beginning of the triple strip.
Zigzag Triple Strip	>2		Exactly like the Parallel Triple Strip Preference, except the cross edges between polygons in the strip form a zigzag pattern.
Stepdown Triple Strip	>4		The Stepdown triple strip requires at least 5 points. This builds a set of quads, crossed in the middle by triples. This option is especially useful for joining two sets of quad strips that have different sized quads. Normals are defined in the same way as with other triple strip preferences.

## Primitive Mode

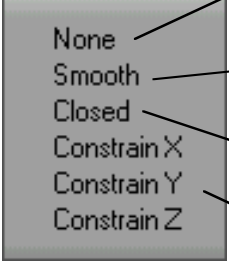
There are six primitive geometries that may be created in primitive mode. Each primitive has a number of key points that must be entered. Entering a point in Primitive Mode is done by clicking the LEFT foot pedal (the same as for other modes). To finish a primitive, click the RIGHT foot pedal (also the same as for other modes). The number of points entered tells DigiScribe what kind of primitive to create. The order in which the points must be entered is critical to properly define most of the primitive shapes. The primitives and their key points are described below.

Points Entered	Primitive Created	Key Points and Descriptions
1	POINT	A single point is created.
2	BOX	Two points, must be diagonally opposite corners of the box. Usually these are the lower left and upper right corners respectively, but they may be any diagonally opposite pair of corners. If the corners lie in a plane, a single rectangular quad will be created. Preferences used: <b>Primitive Segments:</b> defines number of segments in the box.
3	CIRCLE	Three points must lie on the circumference of the circle. The circle can lie on any plane and be in any orientation. Entering points in a counter-clockwise direction will produce a normal that is up with respect to the plane of the circle. Preferences used: <b>Mimimum Primitive Sides:</b> min. number of sides on the circle. <b>AutoPlot Interval Distance:</b> distance between points on the circle in mm if the circle is large enough to have more than the minimum number of sides as defined above.
4	CONE	Four points are required. The first three define the base of the cone and simply create a 3-Point Circle as described above. The fourth point is the tip of the cone. The cone can lie on any plane and be in any orientation, but only symmetric cones can be created. Preferences used: <b>Primitive Segments:</b> defines number of segments in cone. <b>Mimimum Primitive Sides:</b> min. number of sides on cone. <b>AutoPlot Interval Distance:</b> distance between points on cone base if it is large enough to have more than the minimum number of sides as defined above.
5	SPHERE	Five points are used to define a sphere, but only three are used. The first three points must lie anywhere on the surface of the sphere essentially defining a 3-Point Circle as described above. The further apart the points lie, the more accurate the calculation will be. The fourth and fifth points of the 5-Point Sphere are

		<p>simply place holders that tell DigiScribe to create a sphere and not a circle. Preferences used:</p> <p><b>Minimum Sphere Segments:</b> defines number of segments in the sphere. This is the vertical segmentation of the sphere (like the latitude lines on a globe). The default value is 12.</p> <p><b>Mimimum Primitive Sides:</b> min. number of sides on the sphere. This is the radial segmentation of the sphere (like the longitude lines on a globe). The default value is 20.</p> <p><b>AutoPlot Interval Distance:</b> distance between points on the sphere in mm if the equator is large enough to have more than the minimum number of sides as defined above.</p>
6	CYLINDER	<p>Six points are required to define a cylinder. The first three points define a 3-Point Circle that is on the base of the cylinder. The three points must lie anywhere on the circumference of the base of the cylinder. The fourth, fifth and sixth points define a 3-Point Circle that is the top of the cylinder. The cylinder may lie in any orientation, but only symmetric cylinders can be created (bottom and top circles must be the same diameter). Preferences used:</p> <p><b>Primitive Segments:</b> defines number of segments in cylinder.</p> <p><b>Mimimum Primitive Sides:</b> min. number of sides on cylinder.</p> <p><b>AutoPlot Interval Distance:</b> distance between points on cylinder base if it is large enough to have more than the minimum number of sides as defined above.</p>

## Curve Mode

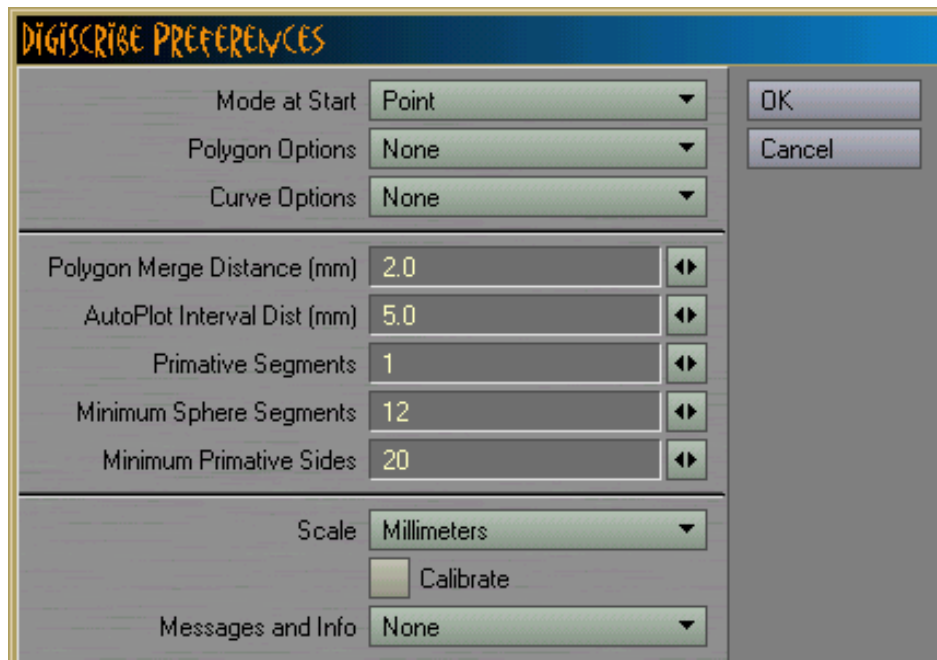
In curve mode, DigiScribe can create a curve from a series of points. To begin a curve, first make sure you are in curve mode by selecting "Curve" from the Mode pulldown menu in the DigiScribe Main Panel (Figure 1). Move the MicroScribe to the point where the curve begins. You can create a curve by tracing the MicroScribe over the curve or you can simply enter a few key points along the curve and a spline will be created. To trace a curve, press and HOLD DOWN the LEFT foot pedal. Trace the MicroScribe over the curve that you wish to make. DigiScribe will automatically place points at the AutoPlot Interval Distance (defined in the DigiScribe Preferences Panel) along the curve. To enter key points for a spline, just click the LEFT foot pedal once to enter each point. NOTE: the spline function used to create the curve is Lightwave's. Sometimes, if you don't enter enough key points along the curve, the resulting spline calculated by Lightwave does not look like the curve you wanted to trace. To finish a curve press the RIGHT foot pedal to complete and draw the geometry. By selecting the "Curve Options" in the DigiScribe Preferences Panel, DigiScribe can create a number of special curves. The types of curves are described below.

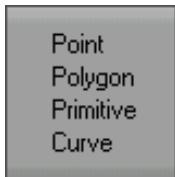
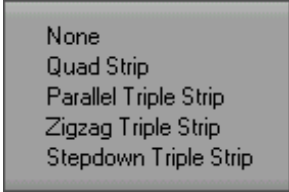
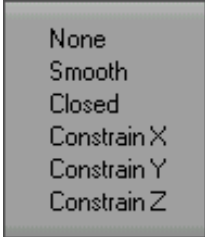
Curve Options Preference Setting	Notes
	Curve is created from the set of points entered using the Lightwave make curve function.
	A smooth curve is created by averaging groups of three points. This function does not smooth curves greatly unless the "AutoPlot Interval Distance" is fairly large. Future versions of DigiScribe will improve this function.
	A Closed curve simply connects the last point and the first point entered by the user.
	Constrained curves have the same X, Y or Z value for all points. The X, Y or Z value is defined by the first point entered.

## Preferences and Settings

DigiScribe maintains a number of preferences in a file called *DigiScribePrefs.txt* located in the same directory as the plugin file. When DigiScribe is launched, it reads the preferences from this file. To change preferences, launch DigiScribe and select the Preferences button on the DigiScribe Main Panel (Figure 1). NOTE: when DigiScribe runs in Demo Mode the default preferences will be shown, but they cannot be changed. The preferences are described below. The DigiScribe Preferences Panel is shown below (Figure 6). A Detailed description of all DigiScribe Preferences follows:

**Figure 6: DigiScribe Preferences Panel**



Preference	Description
Mode at Start	 <p>This preference remembers the mode DigiScribe is in when it starts. The User can set this to be any of the four modes in DigiScribe; but this preference is also set when the user exits DigiScribe. This way, DigiScribe always begins in the last mode it was used in.</p>
Polygon Options	 <p>Polygon Options set the type of polygon created by DigiScribe when in Polygon Mode. More details about each of the pulldown menu items can be found the Polygon Mode section (pg. 14).</p>
Curve Options	 <p>Curve Options set the type of curve created by DigiScribe when in Curve Mode. More details about each of the pulldown menu items can be found the Curve Mode section (pg. 17).</p>
Polygon Merge Distance	<p>The Polygon Merge Distance defines how close (in millimeters) points may be to be merged when entered in Polygon Mode. This is useful when scribing polygon strips that share vertices. The default merge distance is 2.0 mm. Typical merge distances are 1.0 - 3.0 mm. The full range is from 0.0 - 10.0 mm.</p>
AutoPlot Interval Distance	<p>The AutoPlot Interval Distance defines the distance (in millimeters) between points in a curve entered in Curve Mode. The AutoPlot Interval Distance is also used to define the number of sides in a primitive object. See Primitive Mode (pg. 16) for more details. Typical values for AutoPlot Interval Distance are 3.0 - 10.0 mm. The default value is 5.0 mm. The maximum value is 99.0 mm.</p>
Primitive Segments	<p>Primitives including the Cube, Cone and Cylinder have sides that may have more than one segment. With this preference, a user may increase the number of segments on the sides of these primitives. The default value is 1. Values up to 100 are acceptable.</p>
Minimum Sphere Segments	<p>The segments of a sphere primitive determine the number of slices in the sphere (like the number of lines of latitude on a globe). A Sphere Primitive must have at least two segments. The default value is 12. The minimum number is 2, the maximum is 100.</p>
Minimum Primitive Sides	<p>Primitives including the Circle, Cone, Sphere and Cylinder have circular features with a number of sides. This preference defines the minimum number of sides for these primitives. The default value is 20. The minimum number is 2, the maximum is 100.</p>

Scale	The Scale preference selects the type of units that the MicroScribe 3-D device will use. It is very important to match the scale of the MicroScribe to the type of units you are using in Lightwave (metric or English). Otherwise, objects will not be digitized to the correct units.
Calibrate	Checking the Calibration box and clicking "OK" on the DigiScribe Preferences Panel will bring up a Calibration Panel. This allows the user to define a new origin and X axis for the MicroScribe 3-D device. Calibration allows you to align the origin and axis of the MicroScribe with that of the object you wish to model. Details on how to calibrate DigiScribe are given in the Quick DigiScribe Tutorial section (pg. 10). Currently the calibration only defines the new origin and the orientation of the XZ plane. The XZ plane is always oriented parallel to the table on which the MicroScribe sits. The Y axis is always pointed up. Later versions of DigiScribe will allow the user to define any arbitrary set of axes by adding more calibration points.
Messages and Info	<div data-bbox="500 730 898 961" style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> <p>Show Prefs on Start  Show Digscribe Info  Show Microscribe ID  Show Path to DigiScribe.key  Show Path to DigiScribePrefs.txt  None</p> </div> <p>There are a number of messages and information that you may wish to have DigiScribe show. Selecting any one of these Preferences will display a message when you click "OK" on the DigiScribe Preferences Panel.</p> <p><b>Show Prefs on Start:</b> when DigiScribe begins, the Preferences Panel will be displayed in order to show the user what mode, and preferences are currently selected. This is useful for beginners but is usually unnecessary after becoming familiar with the plugin.</p> <p><b>Show Digscribe Info:</b> a message window pops up with DigiScribe version, date and contact information.</p> <p><b>Show Microscribe ID:</b> a message window pops up with the serial number of the MicroScribe 3-D device attached to the computer. This serial number is used to issue a license for the DigiScribe software.</p> <p><b>Show Path to DigiScribe.key:</b> the location of the license file, "DigiScribe.key" is shown. This may be useful if DigiScribe puts this file in a location you are not familiar with.</p> <p><b>Show Path to DigiScribePrefs.txt:</b> The location of the preferences file "DigiScribePrefs.txt" is shown. This may be useful if DigiScribe puts this file in a location you are not familiar with and you need to find the file.</p>

## **DigiScribe Help Messages**

DigiScribe has a number of help messages accessible from its DigiScribe Main Panel. By clicking on the "Show Help Message" button a new message box will open with short-hand directions regarding the current mode and preference settings selected by the user. This is a ver useful function for quickly recapping the features of a particular mode or preference. Help windows must be closed before continuing DigiScribe.

# **3 Troubleshooting DigiScribe**

DigiScribe is designed to run error free under all previously foreseen circumstances. Of course, there are always unforeseen circumstances; and, even if DigiScribe is working properly, that does not mean a user will understand what the software is doing. For simplicity, most DigiScribe errors are denoted with a "DS Error" number. Some of these errors also provide additional information to the user. If an error occurs without a "DS Error" it may be a Lightwave or Microscribe 3-D error. The most common errors encountered are shown below:

## **DigiScribe Error Code Index by Number**

DS Error 01: "Cannot Open DigiScribe.key"  
DS Error 02: "Cannot Create DigiScribe.key"  
DS Error 03: "Can't read demo DigiScribe.key"  
DS Error 11: "DigiScribe.key Read Error"  
DS Error 15: "Demo License Expired"  
DS Error 17: "Contact RetinalReality"  
DS Error 23: "License Key Not Valid"  
DS Error 34: "Contact RetinalReality"  
DS Error 36: "Cannot Open DigiScribe.key"  
DS Error 46: "Contact RetinalReality"  
DS Error 51: "Contact RetinalReality"  
DS Error 60: "Content Directory Too Long"  
DS Error 61: "Content Directory Not Found"  
DS Error 70: "Bad Global"  
DS Error 71: "Lightwave Bad Version"  
DS Error 72: "Bad XPanel Func"  
DS Error 73: "Microscribe Not Found"  
DS Error 74: "Microscribe Not Found"  
DS Error 81: "Contact RetinalReality"

## **Detailed Description of DigiScribe Errors and Solutions**

### DS Error 01: "Cannot Open DigiScribe.key"

Digiscribe cannot find or open the file DSlicense.key in the Lightwave content directory. Digiscribe will create a Demo license and should show a message indicating this. If the user has a beta test or permanent license but Digiscribe does not find it, check to be sure that the DSlicense.key file is located in the Lightwave content directory.

DS Error 02: "Cannot Create DSlicense.key"

An error occurred creating or writing a Demo DSlicense.key. The Lightwave content directory may not be a valid directory. If it is, try restarting Lightwave or the computer and try again. If the problem persists, DigiScribe or the hard disk could be corrupted.

DS Error 03: "Can't read demo DSlicense.key"

An error occurred reading a Demo DSlicense.key. The Lightwave content directory may not be a valid directory. NOTE: a valid content directory must contain a "lightwave" subdirectory (not case sensitive). If the content directory is valid, try restarting Lightwave or the computer and try again. If the problem persists, DigiScribe or the hard disk could be corrupted.

DS Error 11: "DSlicense.key Read Error"

DigiScribe encountered an error reading the license string in DSlicense.key. A bad character could cause this error. Check to make sure the license string is valid. Create a new DSlicense.key file and replace it with the old one. If the problem continues, DigiScribe or the hard disk could be corrupted.

DS Error 15: "Demo License Expired"

It has been more than 7 days since the date of issue of the given demo license. This error will also return the serial number of the Microscribe 3-D device. This is convenient for users who wish to get a beta test or permanent license.

DS Error 17: "Contact RetinalReality"

DigiScribe had a problem validating the license.

DS Error 23: "License Key Not Valid"

The license string in DSlicense.key is more than 20 characters long. Check to make sure the license string is valid. Create a new DSlicense.key file and replace it with the old one.

DS Error 34: "Contact RetinalReality"

DigiScribe had a problem validating the license. Contact Retinal Reality if the problem persists.

DS Error 36: "Cannot Open DSlicense.key"

DigiScribe could not find the license file. Check to see that the location of the DigiScribe.key is in one of the following directories:

1. The current content directory for Lightwave Modeler

2. C:
3. C:/Ligitwave

DS Error 46: "Contact RetinalReality"

DigiScribe had a problem validating the license. Contact Retinal Reality if the problem persists.

DS Error 51: "Contact RetinalReality"

DigiScribe had a problem validating the license. Contact Retinal Reality if the problem persists.

DS Error 71: "Lightwave Bad Version"

The version of Lightwave being used does not support the features used by this plugin.

DS Error 72: "Bad XPanel Func"

When the plugin started it did not properly initialize the Xpanel Function for the DigiScribe Preferences Panel. Try exiting Lightwave, restarting and then launching DigiScribe again.

DS Error 73: "Microscribe Not Found"

DigiScribe could not find the MicroScribe 3-D device. Make sure it is plugged in and turned on. The port or baud rate may also need to be changed. A window will appear allowing you to choose port and baud. Make sure the values input are valid for your computer.

DS Error 74: "Microscribe Not Found"

MicroScribe 3-D Device is not found. It may have become disconnected from the computer during use. Make sure the MicroScribe is plugged in and turned on.

DS Error 81: "Contact RetinalReality"

DigiScribe had a problem validating the license. Contact Retinal Reality if the problem persists.