



# LASER INDUSTRY REPORT

A look at the laser industry's past,  
and where the future of laser entertainment is headed.

Brought to you by Pangolin Laser Systems Inc.

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## Entertainment Lighting – What makes laser unique

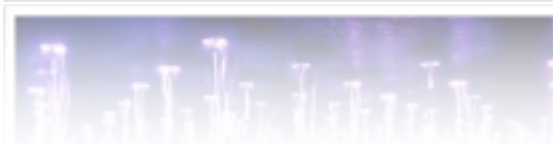
Entertainment lighting is a dynamic field, filled with a variety of lighting options which artists and designers can choose from in order to achieve a desired effect. Over the past few decades, the entertainment lighting business has exploded as new technologies have come to market and the overall cost associated with entertainment lighting have come down. Be it a concert or tour, sporting event, theme park, festival, disco, or bar... Entertainment lighting has proven itself to be a vital element for today's entertainment and production businesses.

While there are a variety of lighting options to choose from, no other lighting source can produce the multitude of effects and have the same emotional impact that laser light can. These factors, combined with recent reductions in the costs associated with producing a laser light show, have contributed to the industry's rapid growth, and analysts now estimate that laser entertainment has grown to become a quarter of a billion dollar a year industry!

## Laser Effects – A brief overview of what you can do with a laser

While a variety of different effects can be produced with laser, there are four primary effects that have emerged as the main staple in laser entertainment. The first, and one of the most versatile effects is the ability to create projected text, logos and animations with a laser. These are known as graphic effects within the Industry. You can also project these types of images and text through water (i.e. water screens) or scrimms to produce what appears to be a floating image (as illustrated below in the image from Disney's World of Color). And finally, different laser graphics can be choreographed together to create full-on laser graphic shows. These can be set to a particular theme (such as a birthday, wedding, holiday, etc). You can watch an example of a laser graphic show on our YouTube channel here:

<http://www.youtube.com/watch?v=omi5M8wp1bs>.



The second effect, and one of the most popular is known as an overhead beam effect. This is where atmospheric laser effects are projected over the heads of people in the audience, and in some cases, a ceiling of sorts can be created out of laser light. Some companies call this Liquid Sky. When projected through fog or haze, it produces a sort of marbling look, which is quite captivating, and can literally give people the feeling that they are in another world. Examples of overhead beam effects are illustrated below.



The third type of effect is an outdoor projection. These can be used just about anywhere, but have become very popular for use in large metropolitan areas, as well as at theme parks, hotels and other attractions. Outdoor projections can be quite complex to setup, as they generally cover a large surface area. But even despite the complexities, these are becoming more and more popular around the world, as the need to entertain large audiences and attract consumers to a given location is growing. Examples of outdoor projections are illustrated below.



The fourth type of effect that can be produced with a laser, and considered by many to be the most beautiful, is called audience scanning. Audience scanning is where the laser light is projected directly into the audience, allowing people to interact and actually touch the light. While this effect is perhaps the most popular which can be produced with a laser, it also requires that the laser operator take certain safety precautions to ensure the well being of those in attendance. In addition, there are certain restrictions surrounding the performance of audience scanning in different parts of the world, so as an entertainment lighting professional, you should be aware of these regulations in the areas you perform. Examples of audience scanning are provided below.



## **The Laser Industry – Past, present and future.**

Laser light shows have always been popular, but decades ago, when shows first got started, the costs involved and technical expertise required to produce a laser light show made them prohibitive for many applications. A laser operator had to essentially be a “jack of all trades”... Encompassing electrical know how, plumbing experience, computer programming experience as well as a variety of other skills just to put on one show. In addition to this, the equipment needed to produce a show could easily run into the hundreds of thousands of dollars. These factors combined together kept the laser show industry in the shadows, and years ago it took a back seat to other lighting options such as LED. As a result, lasers were mostly reserved as an “elite” special effect, only accessible to those with big budgets.

However, over the years companies and institutions (such as the International Laser Display Association) within the laser industry have continually forged ahead, finding newer and more innovative ways to create and control laser light shows. As new technologies continually come to market, the costs and expertise needed to produce a laser light show have been reduced, and as a result, laser effects have become a “mainstay” in a variety of venues and productions.

This brings us to the present day, at a time when we can see laser light shows everywhere. From concerts and tours, to sporting events and festivals, to corporate events... Even live television and movies are using lasers as yet another element to their lighting lineup. In today’s entertainment marketplace, you’ve almost got to have a laser light show in order to even be considered a “big” or “noteworthy” production.

So where is the laser entertainment headed, and how do you as an entertainment professional set yourself up for success in this ever expanding industry?

In the past, the popular thing in laser entertainment was to get “more power”. Many believed that the more powerful the laser projector, the better the show. And with the high costs involved in purchasing or building a laser projector, individuals tended to try to get the most “wattage” for their investment. This was an obvious outlook, because in the past there was a real challenge to control multiple laser projectors.

But as technology has advanced, and the price per laser projector has come down, an epiphany was realized that it is not just about “power” perse, but more about adding multiple laser projectors together, to produce an even more-stunning laser effect. In the past you might see only a few laser projectors at a show (perhaps one, two or if you were lucky three). But now, it is commonplace to see a multitude of laser projectors being used all at the same time, creating a vast array of laser effects. There are many companies in operation right now, who perform shows using 10 or more laser projectors all at the same time.

Not only has the cost come down to purchase a laser projector, but the way in which you control laser projectors has also evolved, and has been simplified. With advancements being made in laser control technology thanks to companies like Pangolin, it is now easier than ever to create laser shows and effects, and play them back across a multitude of laser projectors.

As a result of the technology becoming so much more affordable, and because it is so much easier to control laser projectors than in the years past, we are beginning to see special effects companies who formerly stayed away from lasers, now bringing on the effect on full scale. Lasers are now being combined with effects such as pyro, video, fog, water fountains, and other lighting such as LED, to produce a true multimedia show. With this progression, the need to be able to control multiple laser projectors together with other lighting and effects in an easy to use fashion has grown. And this is where we believe the “future” of laser entertainment, and furthermore entertainment lighting is headed. A multitude of laser projectors, combined with pyro, video, fog, LED, etc. coming together to produce a full multimedia production.



## **BEYOND - The future of laser show creation technology**

Over the past 27 years, Pangolin has become the world’s leading provider of laser light show control software and hardware. Our products have won over 25 awards for technical achievement and product quality, and have contributed to over 370 artistic awards for our clients. Over the years Pangolin has earned a reputation for bringing industry changing advancements in laser control to market. For many years, our award winning Lasershow Designer 2000 laser control system was the industry standard among professional laser light show companies. In 2008, we released QuickShow - an affordable and easy to operate laser controller, which also allows the laser operator to produce some very powerful effects. We developed QuickShow to address the ever-growing consumer market for laser display, and to help a new genre of laserists emerge. QuickShow has proven to be a huge success, and while the product was originally intended for beginner-to-intermediate level operators, many professional laser companies also enjoy the easy workflow QuickShow provides, as well as the ability to create laser effects in a fast and easy manner.

As laser displays are becoming more popular, and as more and more laser projectors are being used in conjunction with other mediums, the need for a controller to address these requirements has grown. So in 2011, we launched version 1.0 of BEYOND, which we envision as the “future of laser show creation technology.” BEYOND combines the ease of use of QuickShow, together with the power of our professional level LD2000 product, and also incorporates a variety of new features, which help to address the growing trends emerging in laser entertainment. Namely, allowing operators to control multiple laser projectors in an easy to use way, and giving operators tools that allow them to easily combine laser with other effects, to produce a multimedia show.

## **BEYOND - Helping you bring your shows into the future**

The BEYOND software platform is immense, and currently exceeds over two million lines of code. While there are a lot of new tools in BEYOND which truly make it the “future of laser show creation technology” this report focuses on just a few of these tools, and explains how you can use them to address these emerging trends in laser entertainment.

Some of the standard features included with BEYOND are:

- Up to 120 K scanning
- Support for up to 6 color channels on both the FB3 and QM2000
- Supports SMPTE, MIDI, DMX, ArtNet and OSC
- Easy control for multiple laser projectors
- The ability to control an unlimited number of projectors through networking
- You can mix and match hardware (FB3 QS, SE and QM2000)
- Built in 3-D modeling and animation program
- Enhanced Reality Preview window
- Use FB3QS units as additional outputs for BEYOND

## **BEYOND - A single unified program**

BEYOND offers clients a single unified program, so now rather than having to run multiple programs to create your laser show, everything is inside of one program, with an intuitive and easy-to-operate user interface. BEYOND comes with a workspace containing over 2,000 cues to choose from and will eventually include the complete Pangolin library of animations and content - all organized and accessible in an easy to use grid that is completely customizable to your show setup. You can also run a dual monitor setup, like you see in the image below. Which is great for live shows and situations where you need to maximize your screen space.





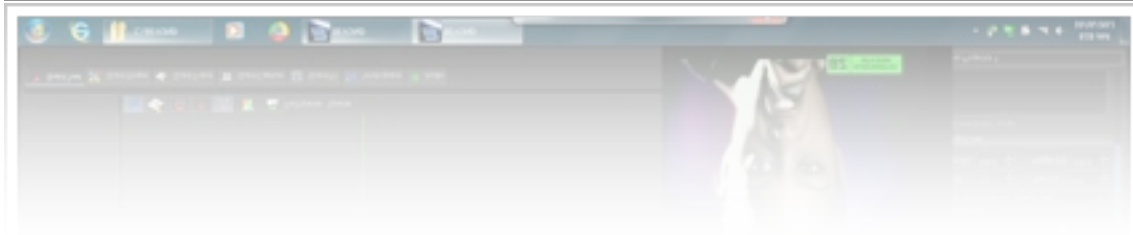
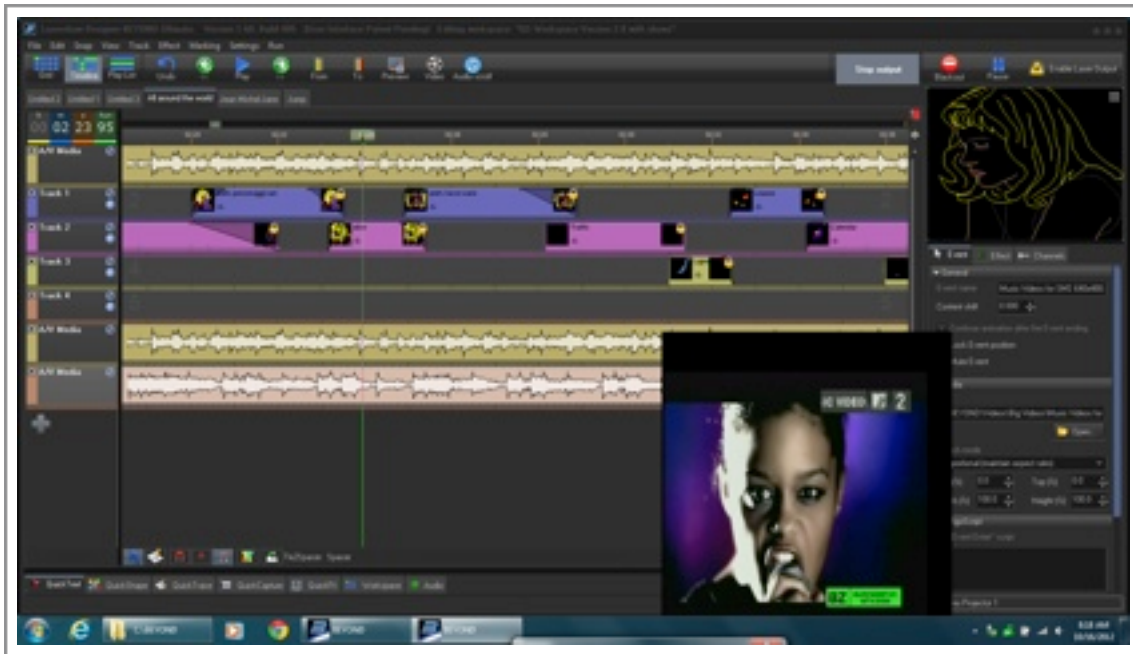
### **PangoScript – Advanced support for MIDI, DMX and ArtNet**

PangoScript is an new feature in Pangolin software, which gives the operator a completely new way of controlling MIDI, DMX, ArtNet, OSC and video. PangoScript allows the operator to actually write their own personalized code commands to communicate with these outside applications. With PangoScript, BEYOND can take control of your MIDI, DMX, ArtNet, OSC or video environment or do the reverse. You can program your MIDI controller to manage your lasers or have it control everything including DMX lightning equipment, video walls, and more. With PangoScript, we provide you with the tools, and your own creativity and imagination now sets the limitations of what can be done.

## BEYOND - Easily combine laser with audio and other media

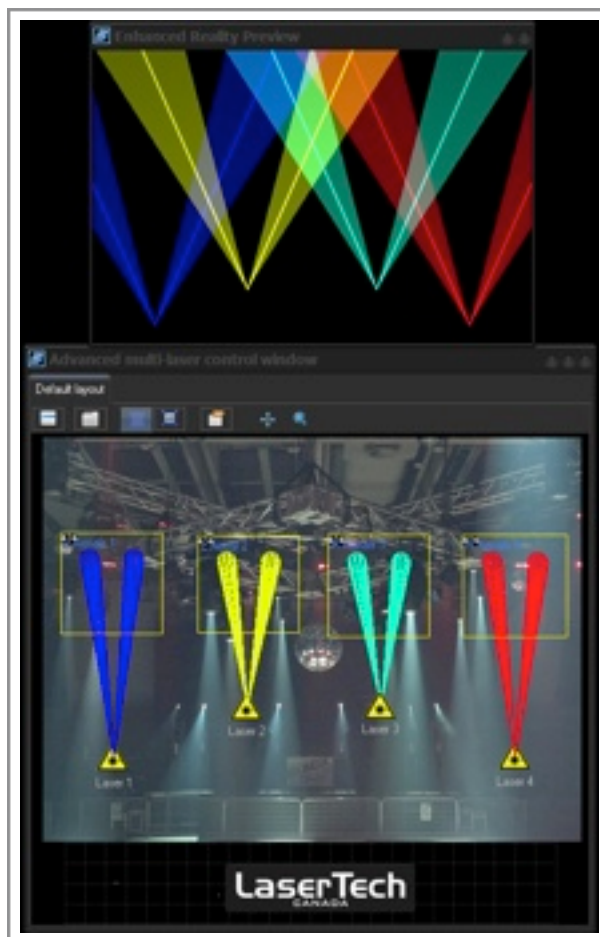
With the growing popularity of multimedia and laser + video shows (where lasers and video are combined together) we have implemented advanced multimedia control into the BEYOND software. We have taken the timeline in BEYOND to a whole new level, allowing operators to import video, audio and other multimedia files directly onto the timeline, and edit and adjust them accordingly.

As screenshot of the video timeline portion of BEYOND is below.



## The BEYOND Universe – Customizable control of multiple laser projectors

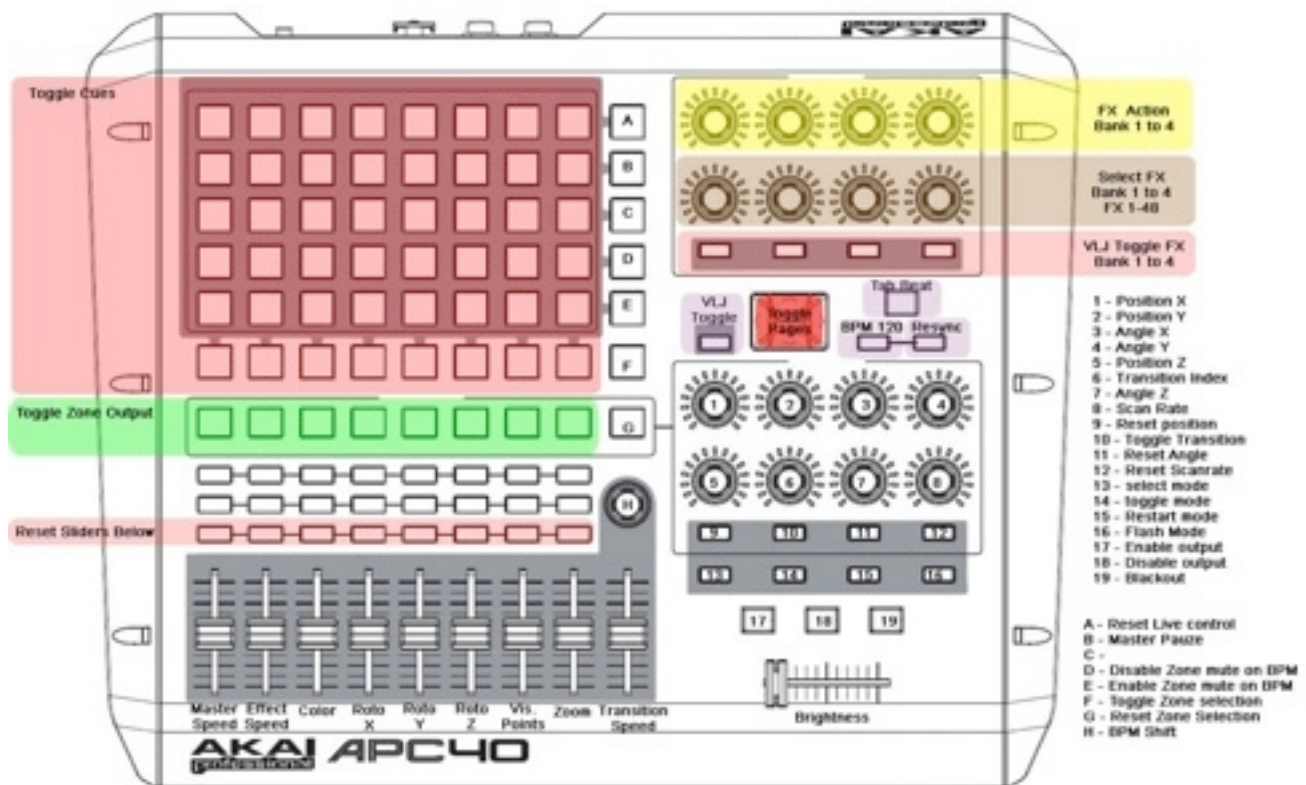
The BEYOND Universe is another new feature inside of this software which sets it apart from anything else out there. With the BEYOND Universe, we've made it much easier to control multiple laser projectors, and to send different effects across those laser projectors. Now, you can simply import a picture of your actual show setup and see precisely where your laser projectors are, and then you can assign effects to those projectors, in an easy point and click fashion. But that's not all. The BEYOND Universe also allows you to make customizable user interfaces, where you can create sequences of buttons and sliders which activate different control options such as size, position, rotation, color, scan speed and more. This is very beneficial for operators who just want to access the features they need for a particular show, without having to move about too much in the program. In addition, it also allows you to pre-program a user interface for a given venue. So let's say you've installed some laser projectors at a local nightclub, but you know that the person who will be running the lasers is not too experienced. You can design a custom user interface just for that venue and operator, which allows the operator to play back with the show precisely how you intended it to be. A screen shot of the BEYOND Universe and how you can import a picture from your show is included below.



## BEYOND - Easy live control

Live laser shows have always been popular, especially in the electronic music scene. When performing “live”, each show is different and presents its own set of challenges. So, we have incorporated new features into BEYOND, which make it easier than ever to perform laser shows “live” and synchronize them with the beat of the music. BEYOND now includes a profile for the popular APC40 MIDI controller, so that clients can simply plugin the device, and have it preset and mapped out with the most popular effects and tools already available for use. A brief demonstration of this is shown on our YouTube channel here: <http://www.youtube.com/watch?v=6ZGnCcp4BoQ> . You can also see and image of the APC40 and how it is mapped out with the BEYOND software in diagram 8 below.

Diagram 8

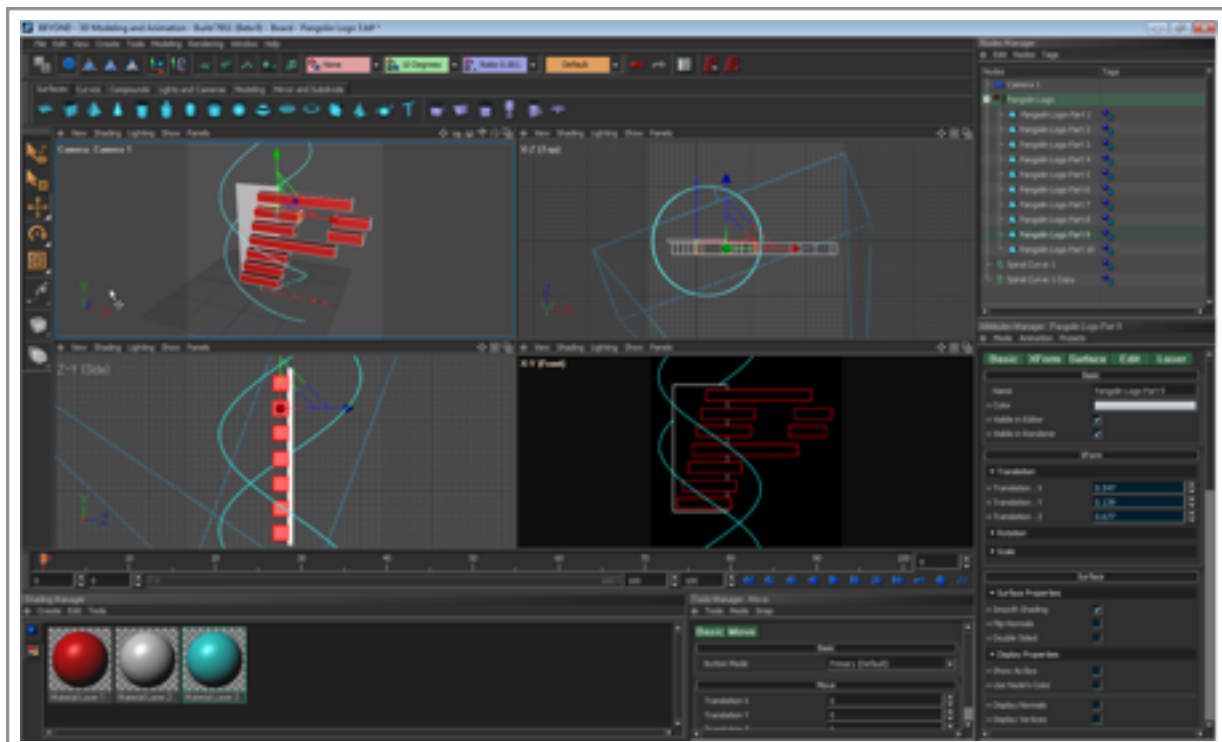


## BEYOND 3D – 3D modeling and animation made easy

The BEYOND 3D modeling and animation program is another great advancement in laser control technology. It was built from the ground up, and was designed for laser people, by laser people, so the way it operates and the functionality of it are much more intuitive to laser people, than previous 3D animation software programs may have been. BEYOND 3D allows you to create complete 3D renderings of objects, shapes, and text. There are a multitude of tools inside of BEYOND 3D, including curve and spline tools, lathe and extrude tools, as well as the ability to create custom camera paths, for bringing your 3D animations to life. We have also created a complete tutorial on how to use BEYOND 3D available on our YouTube channel here:

<http://www.youtube.com/playlist?list=PLC58C618986179B7B>.

A screen shot of the BEYOND 3D animation and modeling program is included below.



## Putting it all together

BEYOND addresses many of these growing trends in laser entertainment, and really focuses on simplifying the process of creating a laser light show. It helps operators control multiple projectors easily and interface with other mediums to create a true multimedia show.

A lot of information was conveyed in this brief report, and we hope that this content has helped to provide you with a better understanding of the laser industry and where it is headed as well as helping to illustrate how BEYOND helps to set you up for success as a laser operator in the future. However, we also realize that you likely have many questions remaining. We at Pangolin are devoted to your success in the laser industry and we would love to hear from you!. We have offices in the United States, Central Europe, and Mainland China, and our team is available nearly 24-hours a day, seven days a week to help serve our clients. Please feel free to call or email us at any time, with any questions you may have about our products or the industry in general. Laser entertainment is our passion, and it is our pleasure to share this with you, and to help you grow in this regard.

**From all of us here at Pangolin... Happy Lasering!**

