SpectraScan™

Laser Effects Glossary

Main Projector Table: Also known as the Optical Table, this comprises the heart of one type of laser effects system. The projector integrates one or two lasers, provides for beam combining and color modulation, as well as high speed switching of the laser light to the various effects. Both lasers are securely mounted to the projector chassis, so the critical alignment necessary to accomplish accurate beam positioning can be achieved. The beams from both lasers are blended and sent through a subtractive color select unit in the back or lower half (if it is side-by-side or over/under configuration) of the laser projector. The beam is cleaned up by being passed through an aperture, and then it emerges into the front or upper portion of the laser projector. The front or upper portion is essentially a large optical table, with 1/4-20 tapped holes on a 1 inch square grid. This allows tremendous flexibility of the projector components for whatever configuration is needed. This projection system is most useful in applications where the optical components will be needed to be reconfigured repeatedly.

Main Projector Rail: This is a highly useful alternative to the Projection Table. The projector integrates one or two lasers, provides for beam combining and color modulation, as well as high speed switching of the laser light to the various effects, just as the table does. Again, both lasers are securely mounted to the projector chassis, so the critical alignment necessary to accomplish accurate beam positioning can be achieved. The beams from both lasers are blended and sent through a subtractive color select unit in the back half of the laser projector. The beam is cleaned up by being passed through an aperture, but here is where the difference between the table and the rail becomes pronounced. In the Projection Table, the laser beam travels across the top of the table, parallel to its surface as it is switched to various optical components. In the Projection Rail, the laser beam stays within a light tight 4 inch square extruded metal enclosure, within which all switching is done. The beam for each port, when selected, is reflected 90 degrees upward and emerges into one of the several turrets mounted across the top of the extruded housing. These turrets hold directable mirrors, diffraction gratings, or

motorized effects. The rail is much smaller and easier to maintain than the table, but not quite as flexible in component layout. It is most useful in permanent applications.

Scanner or Galvo: This is a limited rotation galvonometer. Scan mirrors or pick-off arms can be placed on the shafts, to rotate through approximately +/- 25 degrees for picking off light or scanning the beam in one or 2 axes.

Scan Head: This is the device that produces X/Y or X/Y/Z (or X/Y/I , X/Y/B, or X/Y with blanking, it's all the same item) scanning of the laser beam, usually for graphics. It includes 2 or 3 scanners (usually the feed-back variety) with scan mirrors, the bracket that holds them, and whatever other optical components are needed to direct the beam through the device and out.

X/Y/Blank Scan Head: This is the device that does the actual drawing of computer graphics, as well as mid-air scanning effects. It is interfaced to the QM32 board in your PC computer to run the LDPro Laser Graphics Package via amplifiers. Often the signals going to the amplifiers are conditioned for longer runs with differential line drivers as a solution to noise immunity.

Scan Amplifier: This is an amplifier, usually with feed-back control, that provides the drive current for the scanner galvonometers. It may refer to only the P.C. amplifier, or a package complete with gain and offset controls and power supplies. It is used to translate the low current signal to drive the scanners for graphics control.

PCAOM: Crystal device that independently varies intensity of red, blue, and green laser light simultaneously in a single device. Allows simpler and efficient high speed control of color changes for thousands of color combinations. Also functions as an extremely fast blanking device with full extinction capability. This is one of the most important of recent technological innovations for laser entertainment.

Driver Card or Board: This is the low frequency amplifier that drives actuators with mirror pick-off arms on them (for projector pick-off positions). They differ from the scan amps in that they don't have the capability for feedback control of the galvo and they are usually expected to perform an "ON/OFF" function.

Digital Color Select: This is accomplished by placing dichroic filters in

the beam paths, utilizing the same devices employed for beam pick-off stations. Speeds of modulation of approximately 20 Hz can be achieved. This technique with argon and krypton lasers can give 7 discrete colors.

Fiber-Optic Launchers: These are devices that will couple laser light into a fiber optic cable, so the laser beam can be directed elsewhere. They can be used with satellite projectors, remote effects or remote X/Y scan heads.

Dual Beam Positioners: This is exactly what the name implies; from one pick-off position, 2 laser beams can be launched out into the house to become part of an intricate spider-web beam matrix, or to be directed to some remote effects.

Quad Beam Positioners: This is identical to the above dual positioner, except 4 beams are launched instead of 2.

Beam Matrix: One of the main applications of the dual and quad beam positioners when used in conjunction with remote bounce mirrors is to create intricate spider web matrices of laser beams throughout the house. The bounce mirrors are placed through-out the viewing area, above everyone's heads. They are set such that an individual laser beam from the main projector would strike one mirror, then another mirror, finally with the laser beam going onto a terminating location. The zig-zag patterns of the individual beams of the matrix is especially useful in getting everyone to look all around themselves because no one is ever quite sure where the beams are coming from. If a primary bounce mirror is place at the back of the audience area, then its secondary one placed somewhere in the front, each beam looks like 3 beams (one from and to each mirror). With a dual positioner the effect looks like 6 beams, with a quad positioner, the effect looks like 12 beams!

Bounce Mirrors: High reflective dielectric-overcoated front surface mirrors mounted to aluminum plates on adjustable yokes that mount to theatrical G-clamps. Holo-Spectra also manufactures holographic diffraction gratings used by many of the industry's laser companies. Mirrors are 4 or 8 inch square depending on how many bounces are used.

Rhinestone Wheel Effect: This effect utilizes Austrian crystal rhinestones to create hundreds of beams of various intensities, hues and moving pathways. It is quite dramatic; when the beams fall upon a surface, it looks like a 3-D starfield.

Prism Lumia: This effect will project onto a surface several multi-colored swirling clouds of light. It is especially useful as a contrast to the dynamic, forceful look of multiple laser beams shooting about. This effect is much more fluid and languid.

Diffraction Fiber-Grating: This is the finest 180 degree high transmittance diffraction grating effect, capable of placing a canopy of light over the entire audience area, made up of hundreds of multi-colored beams sharing a precise common 2 dimensional plane. For the first time in laser entertainment systems, *EffectsWizard* can control this device digitally as a stepper position, in rotation, or in an automated jump mode with color changes!

Sheet Scanner: A single axis scanner with a larger than usual mirror is able to provide several different scanned looks from "Star Wars" laser battles to solid sheets of colored light with shimmering hot spots within. Often placed remotely from the projector and hit by a bounce beam or fed by a fiber. With our *EffectsWizard*, they are controlled digitally from software with 3 oscillators capable of sine or square wave and popcorn effects.

Motorized Diffraction Grating: A 2-axis diffraction grating is placed onto a motor shaft, and a pattern of hundreds of individually colored lights are sent splashing out over the viewing area. The motors are direction/speed controllable. With our *EffectsWizard*, they are controlled digitally from software.

Motorized Cone: An angled mirror is placed onto a motor shaft and the rotation of the laser beam produces a circular expanding cone. This is usually used in a down-pour mode from above. The motors are direction and speed controllable. With our *EffectsWizard*, they are controlled digitally from software.