Argon TV

Presents

Q & A To Roberta McHatton
From Laser Safety Services

By Tim Bennett

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With Roberta McHatton

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"Initially the laser was called, an invention looking for a job"

- H. Harry Stine

Q & A To Roberta McHatton
From Laser Safety Services

roberta@lasersafetyservices.com

And so with the hunger to learn more...

And to share that experience with you...

I recently had a conversation about lasers safety with Roberta McHatton from Laser Safety Services.

You can see the full discussion here

After the discussion, a number of the audience asked me questions, which I forwarded to Roberta.

Below are the questions and the reply from Roberta...

I hope you enjoy!

Tim Bennett
ArgonTV

ي **Question 1:** What's the best distance to put a laser from people? - *From Ramesh Pun*

ɭ **Answer:** Note that Audience and performers are different.

For Audience/General Public you need to be 3 meters or about 10 feet from where their feet are. Keep in mind raised seating means you have to be 3 meters over top row and 2.5 meters from the side if lasers are located off stage. See attached diagrams.
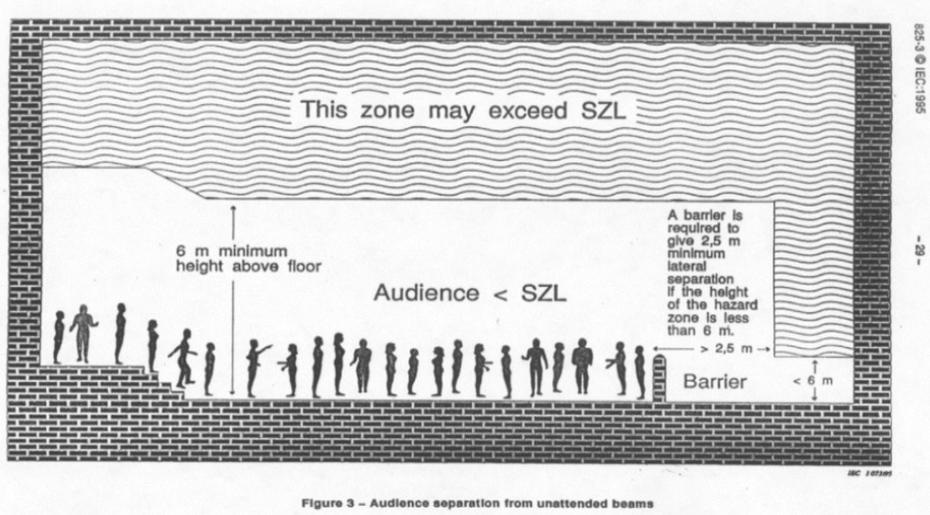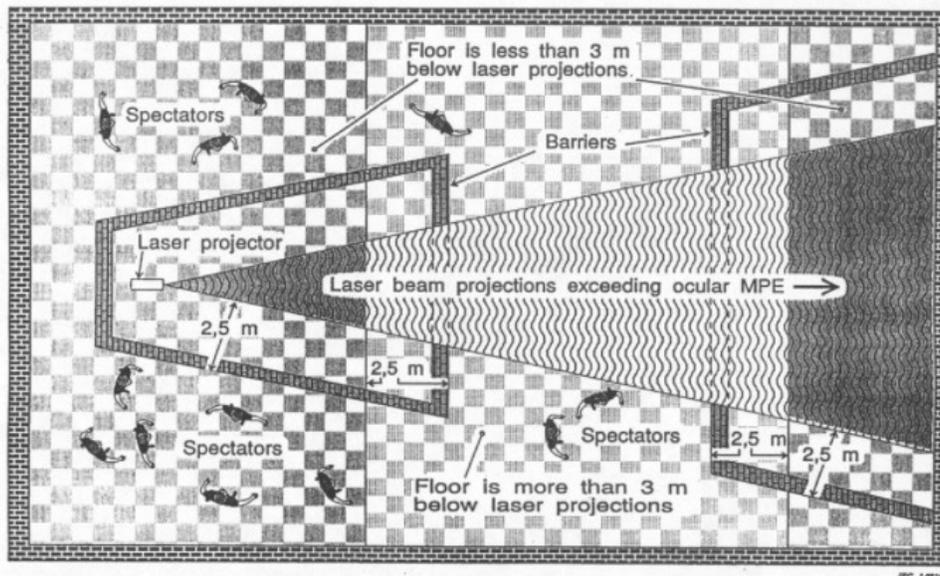

Figure 3 – Audience separation from unattended beams

For performers you can be as close as you want but not touching performers unless you have requested an exemption from governing authorities *(Justin Bieber on Saturday Night Live had lasers crossing his face with eyes closed. Federal government had been informed and granted permission via a variance).*

Anytime you work close to performers you should review the hazards and consider having them sign a statement that they have been told not to look directly at any laser beams.

Audience Scanning is another matter entirely.

I do not recommend the effect.

You can contact ILDA for more information:
https://www.ilda.com/audiencescanningsafety.htm

ى Question 2: What's the best eye protection glasses? *- From Jim Bone*

ł Answer: Below are 3 companies that can provide appropriate eye-wear.

Keep in mind eye-wear is **NEVER** intended to be used for direct viewing of laser beams.

The good news is that protective eye-wear is now available for multiple wavelengths.

That said know that proper eye-wear *'cancels out'* the wavelengths meaning you will not see the beam at all. In our industry we rarely use eye-wear at shows but some states *(Arizona for example)* do require you to have eye-wear in your kit.

Be sure the labels is readable *(not worn off)* and wavelengths are for lasers you are using.

https://noirlaser.com/

https://www.kenteklaserstore.com/

https://www.thorlabs.com/

ى Question 3: With the proper setup/zoning/masking *(and no audience scanning for this question),* what are the biggest risks with non variance lasers being used in shows?

Even before the pandemic, I saw more and more clubs and venues using recognizably non-variance RGB projectors, sadly less and less high quality KVANTs. - *From Pat Willett*

ł **Answer:** Using non compliance can result in loss of equipment, cease and desist orders, possible fines depending on country you are operating in.

In the USA, if reported, it can result in loss of variance if club or company even has a variance.

Manufacturers of lasers sold in the USA are suppose to report the to the Food and Drug Administration.

Ask any company you purchase a laser from for the accession number relating to the model you are buying.

https://www.fda.gov/radiation-emitting-products/home-business-and-entertainment-products/laser-light-shows

Relating to setup/zoning and masking - have extra eyes watching areas of venues you are projecting into to be sure there are no people or reflective objects.

If you are using a beam block or cinefoil be sure it is securely mounted and effective.

Diode lasers have such a tight beam that a beam block may need to be mounted 3 inches from aperture.

ى **Question 4:** Where did Roberta get trained? - *From Tim Hallmark*

ɬ **Answer:** Good one, Tim Hallmark!

I had 2 weeks of training by my predecessor at Laser Fantasy International then I depended on experience technicians/engineers *(such as yourself!)* at the company for help as needed.

LFI supported my LSO efforts by arranging laser safety training with Rockwell and sponsored me to become a member of ANSI Z136 Safe Use of Lasers and SAE G10T committees where fellow members became my mentors.

[Click On Image To Access](#)

ى **Question 5:** How can you be sure a laser with PASS is safe at a certain distance?

As a laser safety officer, all I have is someone's word it is safe. - *From Patrick Murphy*

ɬ **Answer:** One is required to take measurements.

You cannot tell by the naked eye if an AS effect is safe.

You would need to bring instruments and measure yourself.

I highly recommend taking the ILDA audience scanning course prior to conducting any audience scanning.

Here is a link: https://www.ilda.com/LSOcourse.htm. If you have any doubt if a company is providing a safe show ask them to let you see the measurements and distances they took prior to show time.

For more information on how to report unsafe use of lasers:https://www.laserpointersafety.com/report/report.html

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Question 6: What paperwork is required for a laser show to take place inside or outside? - *From Richard Thornett*

Answer: In the USA you are required to submit a variance request and laser light show product report to the FDA *(Food and Drug Administration)* in order to use lasers either indoor or outdoors.

Other countries vary for indoor shows; using inspectors to verify shows are being conducted properly.

Most countries require that you notify the aviation authorities of any unterminated lasers activity.

The form for the USA can be found here:
https://www.faa.gov/forms/index.cfm/go/document.list?omni=Forms&rows=10&startAt=0&parentTopicID=&display=current&q=lasers

For more information see: https://www.laserpointersafety.com/ilda-outdoor.html

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Question 7: What's happening with the MPE levels in Europe, will they be made 10x? - *From Timothy Meadowcroft*

Answer: Not that I know of.

ILDA did submit a white paper to support this idea but no changes have been made to regulations that I know of.

ی **Question 8:** Why does an emergency stop work with the interlock?

It could be simply applied to the main power line, but its always applied by interlock.

Why it is so? - *From Nathalie Fleischmann*

Ɨ **Answer:** Interlocks provide controls reactivation. In the USA we are required to have a manual reset and time delay.

I would defer this question to an engineer such as Tim Hallmark.

ی **Question 9:** What is minimum height above audiences for beam effect and what are the restrictions about shows near harbors. - *From Ray Endermann*

Ɨ **Answer:** See answer to question #1 for details - essentially the standard requires lasers to be 3 meters over ground level or last row of balcony.

As to harbors - if this is unterminated outdoors you would need to contact local aviation authority.

I would recommend contacting Harbor masters and Coast Guard of laser activity.

ی **Question 10:** Is there any safety equipments for laser show besides emergency stop button? - *From Yoshihiro Shibata*

Ɨ **Answer:** Engineering control measures should provide safety by design. Technically an E-Stop requires a procedure - a person to activate it.

Here is the full list of engineering control measures (equipment) for projectors:

a)   Protective housing

b)   Interlocks on Removable Housing

c)   Remote Interlock Connector

d)   Key Control

e)   Beam Block/Attenuator

f)   Activation Warning Systems (from LED light on projectors to alarm activation at door)

g)   Labeling /Warning Signs

Sensing devices, IR cameras, etc are additional and accepted engineering control measures that are added to a laser system such as these that you mentioned.

Opt-electronic presence sensing device, such as safety light curtains seems to be a good option to protect audiences and workers when they accidentally enter to hazardous area.

ي   **Question 11:** With the extensive knowledge you posses and the contacts across the globe, I wonder if it's possible to place an info page or some kind of search engine, where people can find a local safety course and show the costs.

So people are aware of whats involved. *- From Chris Goodchild*

ꞁ   **Answer:** For international reference I would recommend the International Laser Display Association:

https://www.ilda.com/ - ILDA training is recognized internationally and offers a variety of courses – Online **courses** are $525 for **ILDA** Members, or $649 for non-members.

For UK I recommend contacting James Stewart: james@lvroptical.com

For international LSO training I (Laser Safety Services) also provide a laser safety officer training course for $250 USD. The LSS LSO course is conducted virtually,

takes 3-4 hours and does involve a test.

LSS has conducted training for several countries such as US, China, Australia, Peru, UK, Ireland to name a few. *Please note: I do not offer a course on Audience Scanning.*

If you take a class from Laser Safety Services you will also be given lifetime access to our online laser safety manual.

A valuable resource that provides more information., a copy of the the book Laser

Safety for the Light Show Projection Industry, governmental forms, reporting and record keeping forms etc which will help you establish and implement a quality laser safety program.

There are other companies and associations that provide laser safety training but the ones listed above are the ones that specialize in providing training for entertainment application.

There is some thought being given to developing a standard test for laser safety as it applies to entertainment that any of the above organizations would give but we have not done so yet.

If you need more information than given here I would highly recommend you take a laser safety class from any of these resources.

If Your Question Has Not Been Answered Then

===> [Ask Tim Here](#) <===

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