

**1999 DRAFTING REQUEST**

**Bill**

Received: **01/20/99**

Received By: **olsenje**

Wanted: **As time permits**

Identical to LRB:

For: **John La Fave (608) 266-0486**

By/Representing: **Himself**

This file may be shown to any legislator: **NO**

Drafter: **olsenje**

May Contact:

Alt. Drafters:

Subject: **Criminal Law - miscellaneous**

Extra Copies:

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**Topic:**

Misuse of laser pointers

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**Instructions:**

See Attached

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**Drafting History:**

<u>Vers.</u>	<u>Drafted</u>	<u>Reviewed</u>	<u>Typed</u>	<u>Proofed</u>	<u>Submitted</u>	<u>Jacketed</u>	<u>Required</u>
/1	olsenje 02/3/99	jgeller 02/3/99	jfrantze 02/4/99	_____	lrb_docadmin 02/4/99		
/2	olsenje 02/6/99	jgeller 02/6/99	lpaasch 02/8/99	_____	lrb_docadmin 02/8/99	lrb_docadmin 02/10/99	

FE Sent For:

*↳ Not Needed*

<END>

**SUBMITTAL  
FORM**

**LEGISLATIVE REFERENCE BUREAU  
Legal Section Telephone: 266-3561  
5th Floor, 100 N. Hamilton Street**

The attached draft is submitted for your inspection. Please check each part carefully, proofread each word, and sign on the appropriate line(s) below.

**Date:** 2/8/99

**To:** Representative La Fave

**Relating to LRB drafting number:** LRB-1895

**Topic**

Misuse of laser pointers

**Subject(s)**

Criminal Law - miscellaneous

1. **JACKET** the draft for introduction \_\_\_\_\_

in the **Senate** \_\_\_\_\_ or the **Assembly**  (check only one). Only the requester under whose name the drafting request is entered in the LRB's drafting records may authorize the draft to be submitted. Please allow one day for the preparation of the required copies.

2. **REDRAFT.** See the changes indicated or attached \_\_\_\_\_.

A revised draft will be submitted for your approval with changes incorporated.

3. Obtain **FISCAL ESTIMATE NOW**, prior to introduction \_\_\_\_\_.

If the analysis indicates that a fiscal estimate is required because the proposal makes an appropriation or increases or decreases existing appropriations or state or general local government fiscal liability or revenues, you have the option to request the fiscal estimate prior to introduction. If you choose to introduce the proposal without the fiscal estimate, the fiscal estimate will be requested automatically upon introduction. It takes about 10 days to obtain a fiscal estimate. Requesting the fiscal estimate prior to introduction retains your flexibility for possible redrafting of the proposal.

If you have any questions regarding the above procedures, please call 266-3561. If you have any questions relating to the attached draft, please feel free to call me.

Jefren E. Olsen, Legislative Attorney  
Telephone: (608) 266-8906

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Subject: **Criminal Law - miscellaneous**

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/2	olsenjc 02/6/99	ygeller 02/6/99	lpaasch 02/8/99	_____	lrb_docadmin 02/8/99		

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12 2/10 JLG  
27 LR.  
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JR  
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**1999 DRAFTING REQUEST**

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FE Sent For:

<END>

**LEGISLATIVE REFERENCE BUREAU**

Legal Section, 5<sup>th</sup> Floor, 100 N. Hamilton St.  
(608) 266-3561

**BILL REQUEST FORM**

To: Jeffrey Olsen

Use of this form is optional. It is often helpful to talk directly with the LRB attorney who will draft the bill.  
Use this form only for **BILL** drafts. Attach more pages if necessary.

1995

Date of request: 1-15-99	Legislator or agency requesting this draft: JOHN LA FAVE
Name/phone number of person submitting request: 266-0486	" "
Persons to contact for questions about this draft (names and phone numbers please):	" "
Describe the problem, including any helpful examples. How do you want to solve the problem? Purpose of bill is to ban the misuse of laser pointers. Provide for a class D forfeiture. Don't ban single passenger See copy of language from proposed Milwaukee ordinance for a starting guide.	
If you know of any statute sections that might be affected, please list them or provide a marked (not re-typed) copy.	

Please attach a copy of any correspondence or material that may help us. You may also attach a marked (not re-typed) copy of any LRB draft, or provide its number (e.g., 1997 LRB-2345/1 or 1995 AB-67):

Requests are confidential unless stated otherwise.

May we tell others that we are working on this for you?  YES  NO  
 If yes, anyone who asks?  YES  NO  
 Any legislator?  YES  NO  ONLY the following persons:

Do you consider this urgent?  YES  NO If yes, please indicate why:  
 A.S.A.P.

Is this request of higher priority than other pending request(s) you have made?  
 YES  NO If yes, please sign your name here:

..NUMB:

..VERS:

ORIGINAL

..REF:

..XXBY:

ALD. PAWLINSKI

..TITL:

An ordinance relating to the sale, possession and use of laser pointers and providing a penalty.

..SECS:

105-45 cr

..ANLS:

- Analysis -

This ordinance regulates the sale, possession and use of laser pointers as follows:

1. Prohibits intentionally pointing a laser pointer beam at any part of the body of another individual.
2. Prohibits sale of laser pointers to minors under 18 years.
3. Prohibits possession of laser pointers by minors under 18 years.
4. Requires retail stores to locate laser pointers so they either are readily observable by cameras or personnel, or are inaccessible to customers without assistance.

The penalty for a minor possessing a laser pointer is \$200. The penalty for any other violation is a forfeiture of \$500 to \$5,000 or, upon default, imprisonment for not more than 90 days.

..BODY:

The Mayor and Common Council of the City of Milwaukee do ordain as follows:

Part 1. Sections 105-45 of the code is created to read:

105-45. Sale, Possession and Use of Laser Pointers.

1. DEFINITIONS. In this section:

- a. "Laser pointer" means any hand-held device that emits light amplified by the stimulated emission of radiation which is visible to the human eye.

b. "Person" means an individual, firm, partnership, corporation or association.

2. PROHIBITED USE. No person may intentionally, and without good cause, direct a beam from a laser pointer at any part of the body of another individual.

3. SALES TO MINORS. No person, except a parent or legal guardian, employer, teacher or other person authorized to supervise minors, may sell or give away or in any way furnish a laser pointer to any person under the age of 18.

4. POSSESSION BY MINORS. No person under the age of 18 may possess a laser pointer in a public or private place, without the express permission of the owner or operator of the property.

5. RETAIL SALES REGULATIONS. Each person that owns, conducts, operates or manages a retail commercial establishment selling laser pointers shall:

a. Place a sign in the direct view of persons responsible for accepting customer payment for laser pointers stating:

SELLING LASER POINTERS TO PERSONS UNDER 18 YEARS OF AGE IS AGAINST THE LAW. VIOLATORS CAN BE FINED UP TO \$5,000 OR IMPRISONED UP TO 90 DAYS.

b. Display laser pointers in one of the following ways:

b-1. Display laser pointers in such a manner as to make them inaccessible to a customer present in the area allocated for customer use without assistance from an employe of the establishment.

b-2. Display laser pointers in such a manner that cameras or personnel can readily observe customers during all times the establishment is open to the public. Observation by personnel may be facilitated by mirrors.

6. PENALTIES. a. Any person convicted of violating sub. 4 shall forfeit \$200 per violation.


  
 LUNAR PRESS
   
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 Springfield, IL 62704
   
 (217) 241-1400

Centralia
   
 Sentinel

# FDA: Laser pointers are not toys

BY DAVID BELCI
   
 Sentinel News Staff

Laser pointers were strictly an office tool they are a hot novel particularly among young people.

The lipstick-sized laser used to hurt a concentration of light hundreds of feet flashing a red dot.

While some young people view them as amusing they are not harmless. Food and Drug Administration is warning "parents and officials about the risks laser pointers] at reports of eye injury children's misuse of pointers."

"Light energy from a laser pointer aimed into the eye can be more damaging than staring directly in the sun," according to the FDA. "An inadvertent sweep of the light across the person's eyes may cause flash

*Handwritten note:*
  
 I'm not sure if you need any of these

Sheriff Gerald Benjamin. "It is not just a toy; it can hurt someone's eyes and cause permanent damage."
   
 Central Community High School Principal Kent Jones said several laser pointers

have been confiscated from students. "They are not appropriate for school," he said. "We confiscate laser pointers like any inappropriate article."

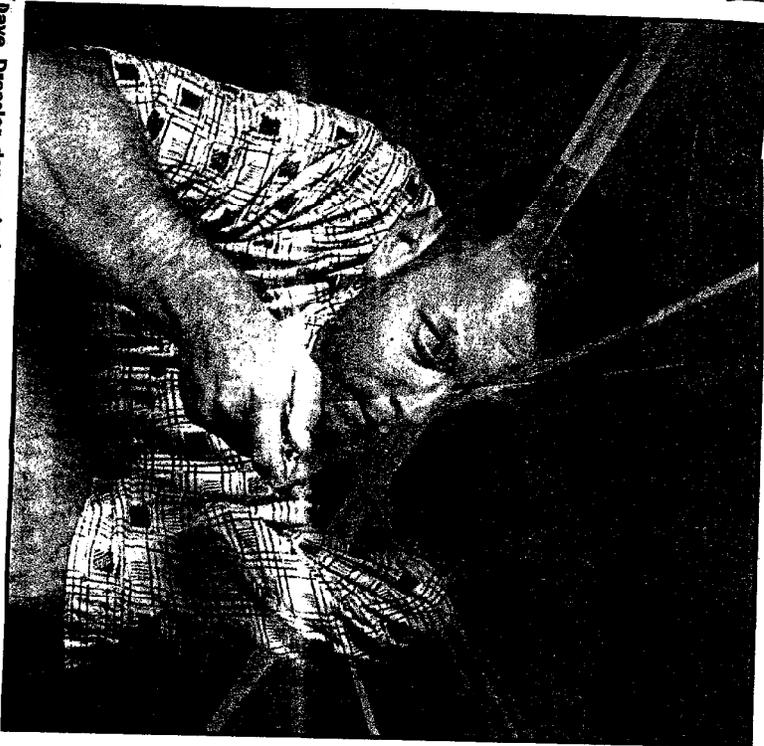
Centralia Junior High School principal Don Bretsch said so only two students were caught with lasers, and "we took them away. They are a real problem."

"Parents need to be aware of the dangers of laser pointers," Hamilton County Sheriff Paul Spaur said. "Hopefully, no one would intentionally try to hurt a fellow classmate, but it is a risk they are fully aware of. It could happen."

"Children need to realize the classroom is no place for laser pointers, and parents should take every measure to see that their children understand that," Spaur said.

The Associated Press furnished some information used in this article.

SEP 29 1989  
Kankakee  
Daily Journal  
20356



Dave Dressler demonstrates a laser pointer, with the special effects help of Journal Photo Editor, Wayne Baramowski. Pointers are losing their appeal as misuse grows.

# 517 Laser pointers beam up trouble

By Tracy Ahrens,  
Assistant Accent Editor

They are slightly longer than a pen cap and can shoot a beam of red light roughly 1,600 feet with accuracy.

These little devices, called "laser pointers," have become a nuisance in public settings including at sporting events, in movie theaters, while driving on the expressway, and simply walking down the sidewalk.

Besides being a nuisance, they can burn retinal tissue in the eyes, according to the American Academy of Ophthalmology.

Their warning labels should say enough: "Caution Laser radiation is harmful to the eyes. Do not look into the laser beam or allow it to be aimed at or near the eyes of others. Keep out of reach of children." But children and adults are not paying much attention to the fine print.

There are different classes of laser power. Laser pointers are class 3a devices that project power of less than 5 milliwatts. Class 3b and 4 lasers are used professionally by ophthalmologists to treat detached retinas and other retinal abnormalities.

Starting at a class 3a laser beam for over 10 seconds can cause retinal damage. The United States Food and Drug Administration says that "light from Class 3a lasers can be as intense or even more intense as that from the sun."

The threat of eye damage is just as great to children as it is to adults, according to Jerome A. Swale, an ophthalmologist with Fisher-Swale Eye Center, Kankakee. The

light can "burn the retinal tissue, which is the macula that allows you to see fine details."

He said that no local complaints about eye damage from laser pointer use have been cited.

In 1977, the FDA issued a warning to parents and school officials about the possible damage to children's eyes from laser pointer use. This warning was started after reports of two school incidences. In one incident, a teacher apparently experienced a 10-day after-image, and a cheerleader suffered vision loss as a result of laser light exposure.

Brief exposure to the laser light should be harmless to the eyes, but staring at the light for a number of seconds could be harmful," Dr. Swale said.

Lt. Larry Regnier with the Kankakee City Police Department said that he hasn't had any complaints about laser pointer use.

The sheriff's department has received a couple of complaints about laser pointers. Kankakee County Sheriff, Tim Bukowski, said that in other towns, auto accidents have resulted from flash blindness caused by the lasers.

Residents living in some area apartments have complained about seeing the red lights flashing on their walls while they are at home. "They think it is a gun sight laser," Bukowski said.

At a low cost of \$12 at many retail stores, the laser pointers are finding their way into the hands of school children. When laser pointers first hit the market, they cost hundreds of dollars.

At Kankakee High School (KHS) one laser pointer has been confiscated so far this year.

"The student was shining the light on the shirt of someone," said Fred Harris, Ph.D., assistant principal of KHS. "They can be dangerous and they shouldn't be pointed at someone. They are devices to be used for constructive purposes, not for play."

A few incidents with laser pointers have popped up at Bishop McNamara High School too. There, pointers are confiscated and parents are asked to come get them.

"In the last two years, one or two pointers have surfaced, and now there are more," said Carole Zediker, dean of students at McNamara.

Area movie theatres have had several complaints about laser pointers, too. At Meadowview Theatre in Kankakee, there were two incidents with the laser pointers in August, according to Cyril Carlson, community marketing manager for Classic Cinemas in Downer's Grove.

Ms. Carlson handles 19 theaters from Kankakee, to Downer's Grove to Fox Lake. Each theater has their own way of finding who is using a pointer in the audience. At one location, the movie screen is transparent and a security person stands behind the screen communicating by walkie-talkie with another security person standing in the theater.

"Most often the offenders are young teenagers, and sometimes men in their 40s," Ms. Carlson said. "Having laser pointers in the theater auditorium is something we highly discourage."

# Lasers point 578 way to trouble

■ Presentation tools can damage eyes, make police nervous

By MARY SCHENK  
News-Gazette Staff Writer

They're either really cool or extremely annoying, depending on what end of a laser pointer you're on these days.

They're showing up not only in conference rooms and lecture halls, but in movie theaters, concerts, cars and school assemblies.

There was even a Seinfeld episode about "the laser guy" who anonymously honed in on George, Kramer and Elaine, driving them crazy.

It's the latest adolescent fad, but it's not necessarily limited to kids.

"We actually have had an increase in sales from last year," said Brian Bollman, vice president of sales for Rogard's, an upscale office supply store.

"The one we do keep in stock, we've sold more this year than all of last year. It lists for \$79," he said, leading him to speculate that kids aren't paying that price.

A \$19.99 version of the battery-powered single light beam is available at Osco. They have lenses that can be changed so that they project different images like a peace symbol.

Cute, huh?

Maybe, unless you're trying to enjoy a movie at the theater and one of those beams is on the screen.

"Yes, we've had complaints," said Phil Carter, manager of the Savoy 16, who said he's dealt with this fad for about a year both here and in Seattle where he last worked.

"Usually it's kids that have them and it's usually a school teacher telling me how it can put somebody's eye out if I don't get that out of there," Carter said.

Carter said normally ushers will try to identify the laser-pointing offenders. They're asked to put the lasers away and if they don't comply, are asked to leave. That's happened a couple of times, Carter said.

Putting an eye out may seem a bit extreme but is not that far off the beam.

Dr. Aashish Gandhi, an ophthalmologist with Carle Clinic, said lasers are employed therapeutically to treat eye diseases and destroy tissue in the eye.



News-Gazette photo illustration by Robert K. O'Donnell

Laser pointers, originally meant for use as tools to aid in making presentations, are seeing use as high-tech toys with which to distract or play pranks.

"The type of laser energy we use is relatively high. I'm not sure laser pointers come anywhere near that, but it is the same principle.

"It's been proven under several studies if you allow excessive light exposure into the eye, even sunlight or ultraviolet light, if that energy is focused on certain parts of the eye, it can cause inadvertent damage," Gandhi said.

Gandhi said there have been cases of researchers working with lasers who got zapped and damaged retinas.

Champaign County Sheriff's Lt. Kris Bolt has a different take on the laser craze.

Last December, Bolt was shot at by a Chicago man who was using a 9 mm semiautomatic pistol that had a laser sight attached to it. The laser increases accuracy by training a brilliant spot of light on the site a bullet is expected to hit.

And the beam doesn't look any different from the cheap laser pointers available at Osco that many seem to be

See LASERS, A-4

## Lasers 578

Continued from A-1

employing for yucks.

"I knew he was armed. I didn't think he was going to teach a class out there," said Bolt, who is able to joke about it now only because he wasn't shot.

His department and others have received complaints from people in cars who have found the lasers trained on them by someone in a passing vehicle.

"They definitely make him nervous.

"If it was a call where I went and had no information about a weapon, if I saw a laser, I'd draw my weapon and look for cover, but I don't think I'd start blasting away," he said.

Bolt said he and fellow officer Tim Voges were on a pleasure trip in South Carolina and when they came out of a motel room, Voges had a red dot trained on his chest.

"We shoved each other and went down (for cover)," he said. "We found the guy (responsible) in the parking lot. We had a chat with the man. He was laughing about it. That's how stupid people are."

Although there haven't been an inordinate number of laser pointers turning up in schools, local school officials in general discourage their use.

Grace Ashenfelter, associate principal at Urbana High School, said the lights, which resemble pens or even come on key chains, are taken from the students and given back to their parents.

"In the case of a freshman or

two, I don't think the students understood these could injure one's eyes," she said.

Bill Trankina, superintendent of the Rantoul City Schools district, said he wasn't aware of any problems with laser pointers in his district, but he still decided to take action after reading about them.

Trankina sent a letter to the parents of each child in his district, notifying them that the pointers would not be allowed in school.

"It's a nuisance," Trankina told school board members at a recent meeting. "Secondly, they presented a clear and present danger."

David Chambers, dean of students at Centennial High School, said he's seen a few of them.

"It's been our practice, if they are seen, that they have been confiscated," he said.

They are generally given back to parents the first time. But if they are seen again, the school may use stricter discipline on the student, including possible suspension.

"The first one I remember was in an all-school assembly. There was somebody making a presentation, and they were shining on the body or on the wall, which is totally distracting," Chambers said.

The lasers also have been used by students in classrooms, which also is a distraction.

"I've seen them in hallways and tell them, 'No, no, no,'" Chambers said.

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57  
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**EAU CLAIRE**  
**Leader-Telegram**

**AUG 13 1998**

**ATION**

Thursday, August 13, 1998  
**Leader-Telegram**

# Don't take risk lightly

## FDA warns of laser pointer hazards

By Knight Ridder News Service

MYRTLE BEACH, S.C. — Laser pointers have been around for several years, but now their safety is questioned as more durable, less expensive lasers hit the market and sales to children increase.

The pen-size devices were originally sold as presentation aids for business people and teachers. The battery-powered laser pointers produce a narrow, bright red beam, and were used by most to point out spots on charts and maps during presentations.

But pointers are everywhere now and are in the hands of children.

Inexpensive laser diodes hit the market from China and Taiwan about eight months ago, said Woody Markland, sales associate for MaricleBeam, a distributor of laser pointers in Dayton, Ohio that sells about 100,000 lasers a week. And with the influx laser prices dropped from about \$60 a unit to below \$15 for some models.

"Every teen has one or wants one," said Markland. "People are just amazed with the technology. You can stand somewhere and reach out and touch someone 1,000 feet away."

As the popularity of hand-held laser pointers increased late last year and more children were buying them, the Food and Drug Administration issued a warning in December to parents and school officials about possible eye damage from laser pointers. The FDA warning stated the light from lasers can be intense and concluded that "injuries associated with these products appear to be related to improper use."

FDA Lead Deputy Commissioner Michael Friedman said that laser pointers "are useful tools for adults that should be used by children only with adequate supervision."

The potential hazard is limited to looking directly into the laser beam with the unprotected eye, said Martin Mainster, American Academy of Ophthalmology spokesman. The issues lay in the improper usage, he said, but the laser's package is clearly labeled with a caution.

"It makes good sense to follow the advice on the package and not stare directly into the beam," Mainster said, "just as it makes sense not to stare into the headlight of an approaching locomotive."

Myrtle Beach police have been receiving their share of complaints about the laser pointers. Sgt. Richard Shoe said they average 20 to 30 calls a night from people complaining about the lasers.

Myrtle Beach police Lt. Robert Marion said if someone is harassed enough with the laser it can be considered disorderly conduct or even assault. People get irritated by them and others mistake them for a gun's laser sight, Marion said.

Markland said children under 9 or 10 years old probably shouldn't have a laser pointer, "but then, there are some 15-years-olds who probably shouldn't have them either. It depends on the maturity of the child."

77.51(21m)

**(21m)** "Telecommunications services" means sending messages and information transmitted through the use of local, toll and wide-area telephone service; channel services; telegraph services; teletypewriter; computer exchange services; cellular mobile telecommunications service; specialized mobile radio; stationary two-way radio; paging service; or any other form of mobile and portable one-way or two-way communications; or any other transmission of messages or information by electronic or similar means between or among points by wire, cable, fiber optics, **laser**, microwave, radio, satellite or similar facilities. "Telecommunications services" does not include sending collect telecommunications that are received outside of the state.

990.01(25g)

**(25g) Optical disk.** "Optical disk" means a rotating circular plate on which information or images are placed in storage, and which is recorded and read by **laser** beams focused on the plate.

available as specified

used in this section following definitions

*Accessible level* means the accessible laser or collateral specific wavelength radiation at a particular wavelength according to paragraph (c) of this section. Accessible laser radiation is radiation to which human access is permitted by paragraphs (b) (12), (c), (d), and (e) of this section.

*Accessible level* means the accessible emission level for a particular class as specified in paragraphs (c), (d), and (e) of this section.

*Access point* means any opening in the enclosure or other enclosure through which laser radiation is emitted, and human access to such opening is permitted.

*Aperture* means an opening of a specified size and to define the area over which radiation is emitted.

*Class II laser product* means any laser product that permits human access during operation to levels of laser radiation in excess of the accessible emission limits contained in table II-A of paragraph (d) of this section.<sup>3</sup>

*Class IIIa laser product* means any laser product that permits human access during operation to levels of visible laser radiation in excess of the accessible emission limits contained in table III-A of paragraph (d) of this section.<sup>4</sup>

*Class IIIb laser product* means any laser product that permits human access during operation to levels of laser radiation in excess of the accessible emission limits contained in table III-B of paragraph (d) of this section.<sup>5</sup>

*Class IV laser product* means any laser product that permits human access during operation to levels of laser radiation in excess of the accessible emission limits contained in table III-B of paragraph (d) of this section.<sup>6</sup>

*Collateral radiation* means any electronic product radiation, except laser radiation, emitted by a laser product as a result of the operation of the laser(s) or any component of the laser product that is physically necessary for the operation of the laser(s).

*Demonstration laser product* means any laser product manufactured, designed, intended, or promoted for purposes of demonstration, entertainment, advertising display, or artistic composition. The term "demonstration

laser product" does not apply to laser products which are not manufactured, designed, intended, or promoted for such purposes, even though they may be used for those purposes or are intended to demonstrate other applications.

*Emission duration* means the temporal duration of a pulse, a series of pulses, or continuous operation, expressed in seconds, during which human access to laser or collateral radiation could be permitted as a result of operation, maintenance, or service of a laser product.

*Human access* means the capacity to intercept laser or collateral radiation by any part of the human body. For laser products that contain Class IIIb or IV levels of laser radiation, "human access" also means access to laser radiation that can be reflected directly by any single introduced flat surface from the interior of the product through any opening in the protective housing of the product.

*Integrated radiance* means radiant energy per unit area of a radiating surface per unit solid angle of emission, expressed in joules per square centimeter per steradian ( $Jcm^{-2} sr^{-1}$ ).

*Invisible radiation* means laser or collateral radiation having wavelengths of equal to or greater than 180 nm but less than or equal to 400 nm or greater than 710 nm but less than or equal to  $1.0 \times 10^6$  nm (1 millimeter).

*Irradiance* means the time-averaged radiant power incident on an element of a surface divided by the area of that element, expressed in watts per square centimeter ( $W cm^{-2}$ ).

*Laser* means any device that can be made to produce or amplify electromagnetic radiation at wavelengths greater than 250 nm but less than or equal to 13,000 nm or, after August 20, 1986, at wavelengths equal to or greater than 180 nm but less than or equal to  $1.0 \times 10^6$  nm primarily by the process of controlled stimulated emission.

*Laser energy source* means any device intended for use in conjunction with a laser to supply energy for the operation of the laser. General energy sources such as electrical supply mains or batteries shall not be considered to constitute laser energy sources.

<sup>3</sup>Class II levels of laser radiation are considered to be a chronic viewing hazard.

<sup>4</sup>Class IIIa levels of laser radiation are considered to be, depending upon the irradiance, either an acute intrabeam viewing hazard or chronic viewing hazard, and an acute viewing hazard if viewed directly with optical instruments.

<sup>5</sup>Class IIIb levels of laser radiation are considered to be an acute hazard to the skin and eyes from direct radiation.

<sup>6</sup>Class IV levels of laser radiation are considered to be an acute hazard to the skin and eyes from direct and scattered radiation.

~~Small beam light~~

## Princeton University Laser Safety Training Guide

### Section 1: LASER FUNDAMENTALS

- ◆ Introduction
- ◆ Laser Theory and Operation
- ◆ Components of a Laser
- ◆ Types of Lasers



### Introduction

The word *laser* is an acronym for Light Amplification by Stimulated Emission of Radiation. Lasers are used as research aides in many departments at Princeton University.

In this document, the word laser will be limited to electromagnetic radiation-emitting devices using light amplification by stimulated emission of radiation at wavelengths from 180 nanometers to 1 millimeter. The electromagnetic spectrum includes energy ranging from gamma rays to electricity. *Figure 1* illustrates the total electromagnetic spectrum and wavelengths of the various regions.

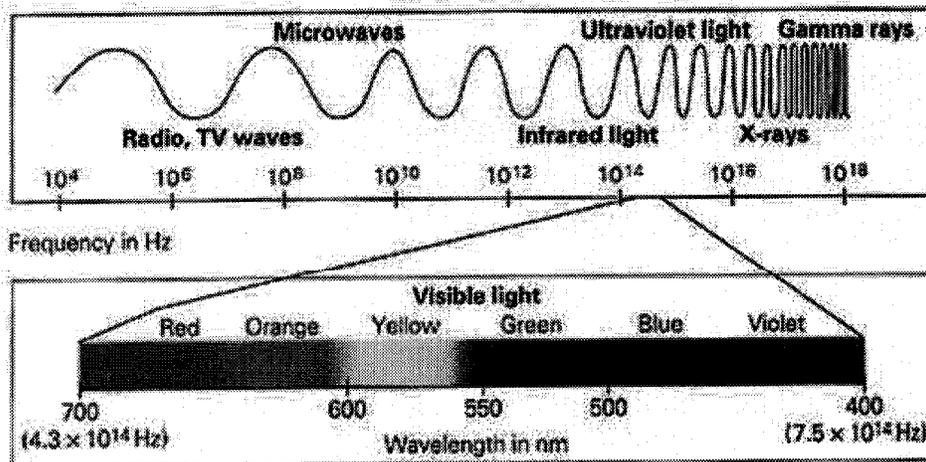


Figure 1. Electromagnetic Spectrum

The primary wavelengths for lasers used at Princeton University include the ultraviolet, visible and infrared regions of the spectrum. Ultraviolet radiation for lasers consists of wavelengths between 180 and 400 nanometers (nm). The visible region consists of radiation with wavelengths between 400 and 700 nm. This is the portion we call visible light. The infrared region of the spectrum consists of radiation with wavelengths between 700 nm and 1 mm.

The color or wavelength of light being emitted depends on the type of lasing material being used. For example, if a Neodymium:Yttrium Aluminum Garnet (Nd:YAG) crystal is used as the lasing material, light with a wavelength of 1064 nm will be emitted. Table 1 illustrates various types of material currently used for lasing and the wavelengths that are emitted by that type of laser. Note that certain materials and gases are capable of emitting more than one wavelength. The wavelength of the light emitted in this case is dependent on the optical configuration of the laser.

<i>Table 1. Common Lasers and Their Wavelengths</i>	
<b>LASER TYPE</b>	<b>WAVELENGTH</b> (in nanometers)
Argon Fluoride	193
Xenon Chloride	308 and 459
Xenon Fluoride	353 and 459
Helium Cadmium	325 - 442
Copper Vapor	511 and 578
Argon	457 - 528 (514.5 and 488 most used)
Frequency doubled Nd:YAG	532
Helium Neon	543, 594, 612, and 632.8
Krypton	337.5 - 799.3 (647.1 - 676.4 most used)
Ruby	694.3
Laser Diodes	630 - 950
Ti:Sapphire	690 - 960
Nd:YAG	1064
Hydrogen Fluoride	2600 - 3000
Erbium:Glass	1540
Carbon Monoxide	5000 - 6000
Carbon Dioxide	10600



## Laser Theory And Operation

A laser generates a beam of very intense light. The major difference between laser light and light generated by white light sources (such as a light bulb) is that laser light is monochromatic, directional and coherent. **Monochromatic** means that all of the light produced by the laser is of a single wavelength. White light is a combination of all visible wavelengths (400 - 700 nm). **Directional** means that the beam of light has very low divergence. Light from a conventional sources, such as a light bulb diverges, spreading in all directions, as illustrated in *Figure 2*. The intensity may be large at the source, but it decreases rapidly as an observer moves away from the source.

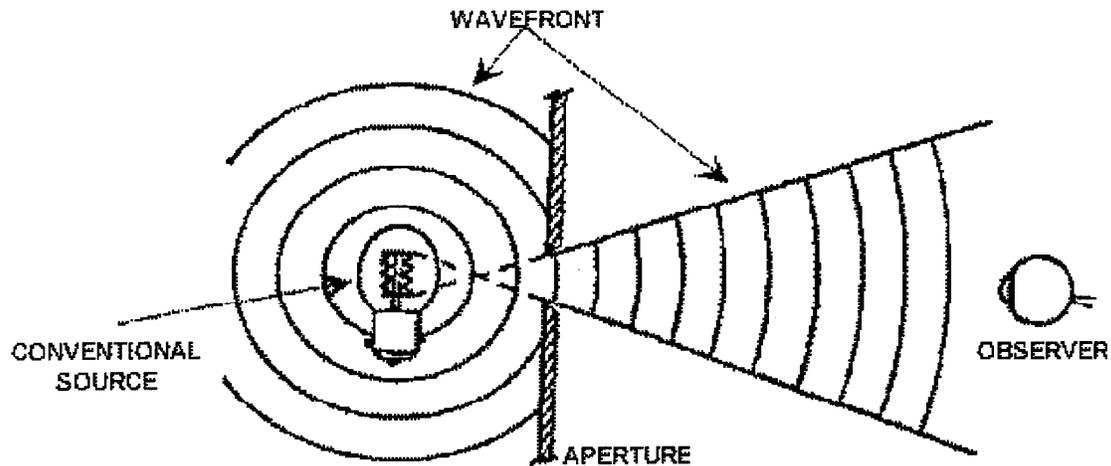


Figure 2. Divergence of Conventional Light Source

In contrast, the output of a laser, as shown in *Figure 3*, has a very small divergence and can maintain high beam intensities over long ranges. Thus, relatively low power lasers are able to project more energy at a single wavelength within a narrow beam than can be obtained from much more powerful conventional light sources.

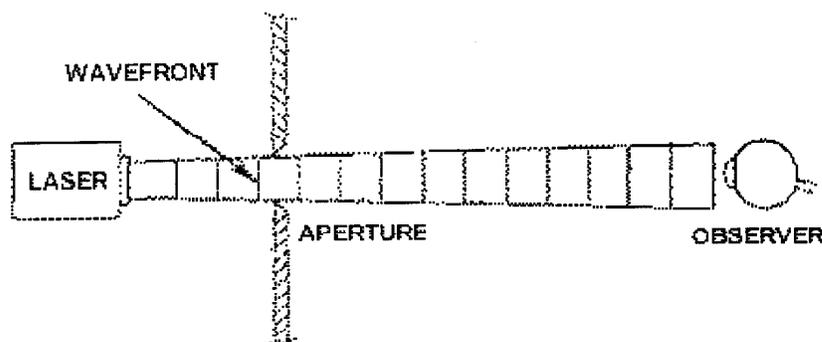


Figure 3. Divergence of Laser Source

**Coherent** means that the waves of light are in phase with each other. A light bulb produces many wavelengths, making it incoherent.

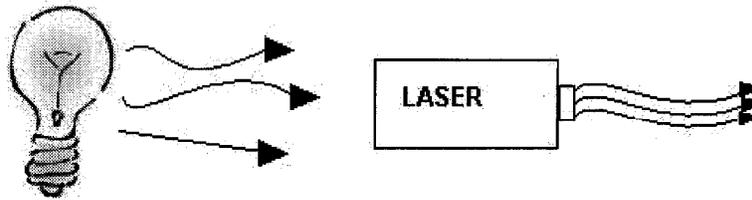


Figure 4. Incoherent light bulb vs. coherent laser.



## Components Of A Laser

Figure 5 illustrates the basic components of the laser including the *lasing material*, *pump source or excitation medium*, *optical cavity* and *output coupler*.

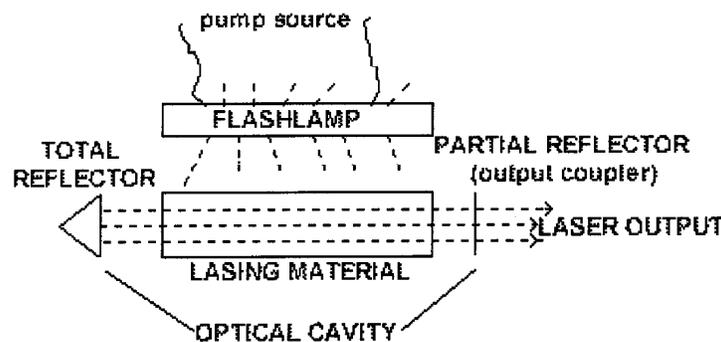


Figure 5. Solid State Laser Diagram

The lasing material can be a solid, liquid, gas or semiconductor, and can emit light in all directions. The pump source is typically electricity from a power supply, lamp or flashtube, but may also be another laser. It is very common in Princeton University laboratories to use one laser to pump another.

The *excitation medium* is used to excite the lasing material, causing it to emit light. The *optical cavity* contains mirrors at each end that reflect this light and cause it to bounce between the mirrors. As a result, the energy from the excitation medium is amplified in the form of light. Some of the light passes through the *output coupler*, usually a semi-transparent mirror at one end of the cavity. The resulting beam is then ready to use for any of hundreds of applications.

The laser output may be steady, as in *continuous wave (CW)* lasers, or *pulsed*. A Q-switch in the optical path is a method of providing laser pulses of an extremely short time duration. The Q-switch may use a rotating prism, a pockels cell or a shutter device to create the pulse. Q-switched lasers may produce a high-peak-power laser pulse of a few nanoseconds duration.

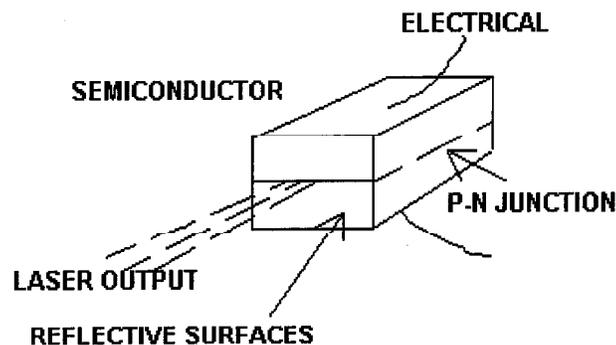
A continuous wave laser has a steady power output, measured in *watts (W)*. For pulsed

lasers, the output generally refers to energy, rather than power. The radiant energy is a function of time and is measured in *joules (J)*. Two terms are often used when measuring or calculating exposure to laser radiation. *Radiant Exposure* is the radiant energy divided by the area of the surface the beam strikes. It is expressed in  $J/cm^2$ . *Irradiance* is the radiant power striking a surface divided by the area of the surface over which the radiant power is distributed. It is expressed in  $W/cm^2$ . For repetitively pulsed lasers, the pulse repetition factor (prf) and pulse width are important in evaluating biological effects.



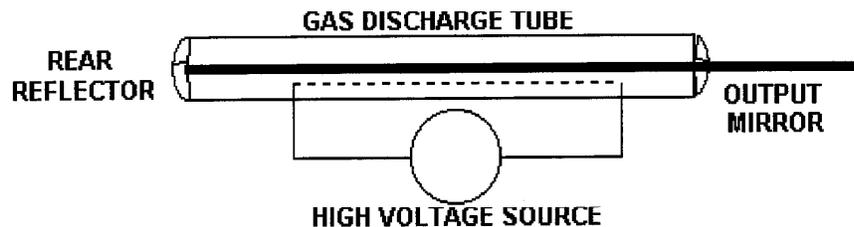
## Types Of Lasers

The **laser diode** is a light emitting diode that uses an optical cavity to amplify the light emitted from the energy band gap that exists in semiconductors. (See *Figure 6*.) They can be tuned to different wavelengths by varying the applied current, temperature or magnetic field.



*Figure 6.* Semiconductor laser diagram

**Gas lasers** consist of a gas filled tube placed in the laser cavity as shown in *Figure 7*. A voltage (the external pump source) is applied to the tube to excite the atoms in the gas to a population inversion. The light emitted from this type of laser is normally continuous wave (CW). One should note that if brewster angle windows are attached to the gas discharge tube, some laser radiation may be reflected out the side of the laser cavity. Large gas lasers known as gas dynamic lasers use a combustion chamber and supersonic nozzle for population inversion.



*Figure 7.* Gas laser diagram

**Dye lasers** employ an active material in a liquid suspension. The dye cell contains the lasing medium. These lasers are popular because they may be tuned to several wavelengths by changing the chemical composition of the dye. Many of the commonly used dyes or liquid suspensions are toxic.

**Free electron lasers** such as in *Figure 8* have the ability to generate wavelengths from the microwave to the X-ray region. They operate by having an electron beam in an optical cavity pass through a wiggler magnetic field. The change in direction exerted by the magnetic field on the electrons causes them to emit photons.

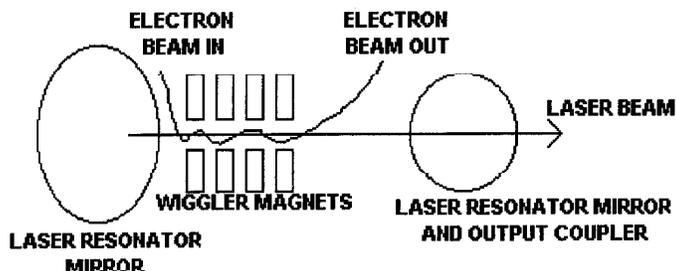


Figure 8. Free Electron Laser Diagram



**Olsen, Jefren**

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**From:** lexis-nexis@prod.lexis-nexis.com  
**Sent:** Wednesday, February 03, 1999 12:33 PM  
**To:** Olsen, Jefren  
**Subject:** LEXIS(R)-NEXIS(R) Email Request (711:0:704508)

108DW6

Print Request: Selected Document(s): 4

Time of Request: February 3, 1999 01:32 pm EST

Number of Lines: 34  
Job Number: 711:0:704508

Client ID/Project Name: self

Research Information:

Note:

PAGE 1

4 of 17 DOCUMENTS

THE STATE OF CONNECTICUT  
BILL TEXT  
STATENET

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1999 Bill Text CT H.B. 5358

CONNECTICUT 1999 REGULAR SESSION OF THE GENERAL ASSEMBLY

HOUSE BILL 5358

STATE OF CONNECTICUT  
GENERAL ASSEMBLY  
PROPOSED BILL NO. 5358  
JANUARY SESSION, 1999  
LCO NO. 559  
REFERRED TO COMMITTEE ON JUDICIARY  
INTRODUCED BY: REP. TULISANO, 29TH DIST.

BILL TRACKING REPORT: 1999 Bill Tracking CT H.B. 5358

1999 Bill Text CT H.B. 5358

VERSION: Introduced

VERSION-DATE: January 14, 1999

SYNOPSIS:

AN ACT CONCERNING MISUSE OF A LASER POINTER.

TEXT:

Be it enacted by the Senate and House of Representatives in General Assembly convened:

That title 53a of the general statutes be amended to provide that a person under the age of eighteen years shall be guilty of misuse of a laser pointer if such person shines, points or focuses a laser pointer directly or indirectly upon another person in such a manner as to cause injury or harm. Misuse of a laser pointer shall be an infraction.

Statement of Purpose: To protect children from misuse of laser pointers that can result in serious eye damage as well as potential fatal injury if such laser beam is directed at a police officer.

SPONSOR: Tulisano

LOAD-DATE: January 19, 1999

108DW6

\*\*\*\*\* Print Completed \*\*\*\*\*

Time of Request: February 9, 1999 01:32 pm EST

Print Number: 711:0:704508

Number of Lines: 34

Number of Pages: 1

# JOHN LA FAVE



---

## STATE REPRESENTATIVE 23RD ASSEMBLY DISTRICT

January 29, 1999

TO: Jefren Olsen

FR: Rep. John La Fave 

RE: Laser Pointer Bill Draft

Reminder: Change the penalty to a Class B forfeiture.

Also, besides banning the pointing of a laser beam onto another person, this bill should also include language similar to 941.2965 (2) to address dangers that could occur or disruptions to public order.



State of Wisconsin  
1999 - 2000 LEGISLATURE

LRB-1895/1

JEO:.....

Jary  
Soad

D-Note

JK

1999 BILL

gen cat

1 AN ACT ...; relating to: restrictions on the use of laser pointers and providing a  
2 penalty.

*Analysis by the Legislative Reference Bureau*

Current law provides various restrictions on acts that endanger public health and safety. Among the acts covered by these restrictions are tampering with household products, placing foreign objects in edibles and possessing or using certain weapons or devices that imitate or look like certain weapons. For instance, current law prohibits a person from carrying or displaying a facsimile firearm in a manner that could reasonably be expected to alarm, intimidate, threaten or terrify another person. This prohibition applies to a replica of a firearm, a toy firearm, a starter pistol or any other object that bears a reasonable resemblance to or that reasonably can be perceived to be an actual firearm. A person who violates the prohibition may be subject to a forfeiture (a civil monetary penalty) of not more than \$500.✓

with certain exceptions,

This bill creates restrictions on the use of laser pointers. Under the bill, no person may do any of the following with a laser pointer: 1) intentionally and for no legitimate purpose direct a beam of light from the laser pointer at any part of the body of any human being; or 2) direct a beam of light from the laser pointer in a manner that could reasonably be expected to alarm, intimidate, threaten or terrify another person. A person who violates the prohibition created in the bill may be subject to a forfeiture of not more than \$1,000.✓

*The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:*



**DRAFTER'S NOTE**  
**FROM THE**  
**LEGISLATIVE REFERENCE BUREAU**

LRB-1895/1dn

JEO:.....

JLO

Representative La Fave:

Please note the following when reviewing this draft:

1. I modified the definition slightly to make it clear that what has to be visible to the human eye is the light emitted by the device, not the process of stimulating emission of radiation. For consistency with the provision concerning the prohibited use of a laser pointer (proposed s. 941.299 (2) (a)), the definition also refers to a "beam" of light.

2. In addition to the prohibition against using a laser pointer to direct a beam on another's body, the draft includes language adapted from s. 941.2965 (2), stats. See proposed s. 941.299 (2) (b).

3. Instead of using the phrase "without good cause", this draft uses "for no legitimate purpose" because the latter phrase is used in the criminal code (while the former is not) and seems a bit more objective.

Please let me know if you have any questions or changes.

Jefren E. Olsen  
Legislative Attorney  
Phone: (608) 266-8906  
E-mail: Jefren.Olsen@legis.state.wi.us

**DRAFTER'S NOTE  
FROM THE  
LEGISLATIVE REFERENCE BUREAU**

LRB-1895/1dn  
JEO:jlg:jf

February 4, 1999

Representative La Fave:

Please note the following when reviewing this draft:

1. I modified the definition slightly to make it clear that what has to be visible to the human eye is the light emitted by the device, not the process of stimulating emission of radiation. For consistency with the provision concerning the prohibited use of a laser pointer (proposed s. 941.299 (2) (a)), the definition also refers to a "beam" of light.
2. In addition to the prohibition against using a laser pointer to direct a beam on another's body, the draft includes language adapted from s. 941.2965 (2), stats. See proposed s. 941.299 (2) (b).
3. Instead of using the phrase "without good cause", this draft uses "for no legitimate purpose" because the latter phrase is used in the criminal code (while the former is not) and seems a bit more objective.

Please let me know if you have any questions or changes.

Jefren E. Olsen  
Legislative Attorney  
Phone: (608) 266-8906  
E-mail: Jefren.Olsen@legis.state.wi.us

Rep Lafine 1895

Disruption of public/private events

Something similar to DC ? 977.81

- breach of peace ?

- disturbance ?



State of Wisconsin  
1999 - 2000 LEGISLATURE

LRB-1895/1

JEO:jlj:jf

Very  
Soon

redraft  
maker  
run

2

1999 BILL

Regen

- 1 AN ACT to create 941.299 of the statutes; relating to: restrictions on the use of
- 2 laser pointers and providing a penalty.

*Analysis by the Legislative Reference Bureau*

Current law provides various restrictions on acts that endanger public health and safety. Among the acts covered by these restrictions are tampering with household products, placing foreign objects in edibles and possessing or using certain weapons or devices that imitate or look like certain weapons. For instance, current law, with certain exceptions, prohibits a person from carrying or displaying a facsimile firearm in a manner that could reasonably be expected to alarm, intimidate, threaten or terrify another person. This prohibition applies to a replica of a firearm, a toy firearm, a starter pistol or any other object that bears a reasonable resemblance to or that reasonably can be perceived to be an actual firearm. A person who violates the prohibition may be subject to a forfeiture (a civil monetary penalty) of not more than \$500.

This bill creates restrictions on the use of laser pointers. Under the bill, no person may do any of the following with a laser pointer: 1) intentionally and for no legitimate purpose direct a beam of light from the laser pointer at any part of the body of any human being; 2) direct a beam of light from the laser pointer in a manner that could reasonably be expected to alarm, intimidate, threaten or terrify another



**BILL**

ANALYSIS  
INSERT

person. A person who violates the prohibition created in the bill may be subject to a forfeiture of not more than \$1,000.

*The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:*

1           **SECTION 1.** 941.299 of the statutes is created to read:

2           **941.299 Restrictions on the use of laser pointers.** (1) In this section,  
3 "laser pointer" means a hand-held device that uses light amplification by stimulated  
4 emission of radiation to emit a beam of light that is visible to the human eye.

5           (2) No person may do any of the following:

6           (a) Intentionally and for no legitimate purpose direct a beam of light from a  
7 laser pointer at any part of the body of any human being.

8           (b) Direct a beam of light from a laser pointer in a manner that could reasonably  
9 be expected to alarm, intimidate, threaten or terrify another person.

INS  
2-9

10           (3) Whoever violates sub. (2) is subject to a Class B forfeiture.

11           **SECTION 2. Initial applicability.**

12           (1) This act first applies to offenses occurring on the effective date of this  
13 subsection.

14

(END) ✓

1999-2000 DRAFTING INSERT  
FROM THE  
LEGISLATIVE REFERENCE BUREAU

LRB-1895/2ins  
JEO:.....

1

**ANALYSIS INSERT:**

wo 91 ; or 3) direct a beam of light from a laser pointer in a manner that, under the circumstances, tends to disrupt any public or private event or create or provoke a disturbance. ✓

2

**INSERT 2-9:**

3

¶ (c) Direct a beam of light from a laser pointer in a manner that, under the circumstances, tends to disrupt any public or private event or create or provoke a disturbance. ✓

5