

FAA Form 7140-1, Notice of Proposed Outdoor Laser Operation(s)

Who Should Complete and Submit This Form

Any person, entity, or proponent who plans to conduct outdoor laser operations with a visible laser beam exceeding 50 nanowatts per square centimeter in navigable airspace or with any laser beam (visible or non-visible) that exceeds the maximum permissible exposure in navigable airspace. FAA encourages proponents to contact the applicable FAA service center for guidance.

Instructions to Complete

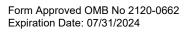
Consult FAA Advisory Circular (AC) 70-1 for detailed instructions to assist with completing and submitting this form. Refer to FAA Order JO 7400.2, Chapter 29 for additional background information. FAA provides public access to these documents via https://www.faa.gov/regulations_policies.

Please print or type on this form and complete all sections prior to submission to the appropriate FAA service center. To enhance clarity, use plain language and numbers, e.g., decimal notation (0.7277) instead of scientific notation (72.77x10-2 or 72.77E-02). Failure to provide all requested information may delay processing.

Paperwork Reduction Act Statement

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number. The OMB control number for this information collection is 2120-0662. Public reporting for this collection of information is estimated to be approximately 240 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing, and reviewing the collection of information.

The Federal Aviation Administration (FAA) requires all responses to this collection of information if the proponent wishes to obtain or retain benefits available per Title 21 Code of Federal Regulations Part 1010 if projecting into navigable airspace. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

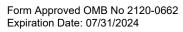




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	U.S. Department of Transportation
	Federal Aviation Administration

	Notice of Proposed (Jutdoor Laser O	peration(s)			
1. General information						
a. To (FAA Service Center)		b. From (Proponent)				
Western Se	ervice Center	Elinor Gates				
		Lick Observatory				
c. Name of event Lick Observator facility	ory, 120-inch Telescope	d. Date prepared 2025 Jan 13				
e. Customer		f. Site address Lick Observatory, 120-inch Telescope Dome				
Same as proponent		7281 Mount Hamilton Road				
		Mount Hamilton, CA 95140				
2. Date(s) and time(s) of laser operation						
a. Testing and alignment 4/15/2025 to 12/31/2025		b. Operation 3 to 7 nights per month				
3. Brief description of laser operation						
•	•		n. A 12W (maximum average			
power) sodium D-line (58	39nm) laser, mounted on t	he 120-inch Shan	e telescope is used to create an			
artificial star at an altitud	e of 90kn for correction of	atmospheric turb	ulence on images.			
4. On-site operation information						
^{a. Operator(s)} Jeff Roark, Dare	en Dillon, Steven Rako, Na	athan Woody				
b. On-site phone 1 408-238-065	52	c. On-site phone 2 408-238-0651				
(primary) 400-230-003	,_	(secondary)				
5. FDA/CDRH information (if applicable)						
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a. Variance # 6. Brief description of control measures	expiration date	ers, stationed on				
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Laser Configuration Worksheet							
10. Configuration information a. Configuration number (example: 7 of 9):1 of1							
b. Brief description of configuration Arete 589nm Laser beam expanded to 25cm. See Attachment I.							
11. Geographic location							
a. Site elevation, in feet mean sea level:	4219	d. Information determined by: ☐ GPS ■ Map (topo) ☐ Other:					
b. Laser height above site elevation, in feet		uogroco,	20 minutes, 34.931 seconds				
c. Overall laser elevation (a) + (b), in feet m	nean sea level: 4219	f. Longitude: -121 degrees,	38 minutes, 13.689 seconds				
12. Beam characteristics and calculation	ns (check only one mode of operation and fil	l in only that column)					
Mode of Operation	☐ Single pulse	■ Continuous wave	☐ Repetitively pulsed				
a. Laser and beam characteristics Laser type		dia da					
(example: CO ₂ , diode, or Nd:YAG)		diode					
Laser hazard class (example: Class 2, Class 3B, Class 4)		Class 4					
Power Watts (W)	(not applicable)	(maximum power)	(average power)				
Pulse energy Joules (J)		(not applicable)					
Pulse duration Seconds (s)		(not applicable)					
Pulse repetition frequency (PRF) Hertz (Hz)		(not applicable)					
Beam diameter at 1/e points Centimeters (cm)		25					
Beam divergence 1/e at full angle Milliradians (mrad)		0.002					
Wavelength(s) Nanometers (nm)		589					
b. Maximum permissible exposure (MP	PE) values (use this value to calculate the NC	OHD)					
MPE Milliwatts per square cm (mW/cm²)	(not applicable)	2.6					
MPE per pulse Joules per square cm (J/cm²)		(not applicable)					
c. Visual effect calculations	th visible wavelengths (400 nm to 700 nm). If	the laser has no visible wavelengths, enter	"N/A (non-visible laser)" in all blocks				
Pre-corrected power (PCP)	Pulse energy (J) x 4	Maximum power (W)	Pulse energy (J) x PRF (Hz)				
Watts (W)		12					
Visual Correction Factor (VCF) Enter "1.0" or use FAA AC 70-1 Table 3		0.8696					
Visually Corrected Power See FAA AC 70-1		10.4					
13. Beam direction(s)							
a. Minimum elevation angle (degrees, where horizontal = 0 degrees)	45	c. Azimuth (degrees, least to greatest) 0 to 360	■ True north or □ Magnetic north				
b. Maximum elevation angle (degrees, where vertical = 90 degrees)	90	d. Magnetic declination (degrees, if using magnetic north)	Magnetic Hortin				
14. Protection distances (fill in the entire	NOHD row <u>and</u> the entire column for the app	licable mode of operation)					
	Slant range (feet)	Horizontal distance (feet)	Vertical distance (feet)				
a. NOHD (based on MPE value)		52775					
	ith visible wavelengths (400 nm to 700 nm). If		'N/A (non-visible laser)" in all blocks.				
b. SZED (for 100 μW/cm²)		269100					
c. CZED (for 5 μW/cm²)		1203452					
d. LFED (for 50 nW/cm²)		12034515					
15. Calculation method Commercia	al software (enter product name and version l	below) or 🗉 Other (describe method such a	s a spreadsheet or calculator below)				
Calculator							