

	REPUBLIC OF SOUTH AFRICA CIVIL AVIATION AUTHORITY	CAA Private Bag x08 Waterkloof 0145
Tel: (012) 346-5566 Fax: (012) 346-6059 E-Mail: mail@caa.co.za	AERONAUTICAL INFORMATION CIRCULAR	AIC 21-35 02-10-15

OPERATION OF AIRCRAFT

SAFETY

LASER HAZARD TO AVIATION

☞ Indicates changes.

☞ This AIC replaces AIC 21-35 dated 99-10-15.

1. *The utilization of lasers for outdoor entertainment is becoming an increasingly popular and common occurrence, internationally and locally. In the USA a few cases have been reported where these laser beams have blinded pilots with near fatal results. Incidents are becoming more frequent and it has become apparent that certain flight hazards are associated with these lasers.*
2. *The danger of light emitted by laser is due to the fact that the light is focussed by the lens of the eye onto a very small area on the retina. Conventional lighting is focussed to form an extended picture on the retina. It is this focussing of the laser beam onto a tiny area of the retina that makes the human eye more sensitive to laser light and possible damage to the eye may occur.*
3. *The two most pronounced dangers associated with these lasers are partial or complete pilot incapacitation due to temporary loss of vision and/or spatial disorientation.*
 - a. *Temporary loss of vision.*
 - i. *A direct hit on the eye, as when a pilot would look directly at the source of a beam, could induce temporary blindness, due to the physical effect of the laser on the retina, (eye sensitivity, as explained above).*
 - ii. *A laser beam striking a curved windshield could scatter and cause flashblindness due to glare and/or after-image.*
 - b. *Spatial disorientation.*
 - i. *Both cases above, a(i) and a(ii), can induce spatial disorientation. Spatial disorientation thus induced could have serious consequences.*
 - ii. *In simulator studies carried out in the USA it has been found that pilots are most vulnerable to laser illumination when at night with no visual horizon and in a steady state turn.*
4. *Good airmanship would attempt to preclude illumination events and reduce the effect of such by employing one or more of the following suggested actions:-*
 - a. *Switching on all external lights would make your aircraft more visible to the laser safety observer or operator, thus aiding in preventing laser beams from being aimed towards your aircraft.*
 - b. *Switching on all internal lighting (including thunderstorm lights) will aid in preventing flash-blindness. However, it should be noted that this might reduce vision outside the cockpit, particularly in sparsely hit areas.*
 - c. *Engaging the autopilot, where relevant, when approaching an area where lasers are operating or anticipated, will assist in maintaining control, should an illumination event occur.*
5. *In the event of a laser light illuminating a flight crew, the following is suggested -:*
 - a. *Avoid looking directly at the source of the light.*
 - b. *Ensure the autopilot is engaged (if applicable).*
 - c. *Ensure all external lighting is switched on.*
 - d. *Report the incident to the nearest ATSU to assist other pilots in avoiding being illuminated.*
 - e. *Report the incident to the CAA.*
6. *Subsequent to being illuminated by laser it is recommended to undergo an eye examination by a specialist to determine if the eye damage has occurred.*
7. *The CAA has drafted legislation for the control of lasers used in displays. The legislation for the control of lights and objects which endanger the safety of aircraft is contained in Regulation 139.01.11 (as amended), which has been*

approved by the Minister and will be promulgated in the fourteenth amendment of the Civil Aviation Regulations, 1997 in due course.

COMMISSIONER FOR CIVIL AVIATION