

No evidence to suggest lasers pointed at cockpits damage pilots' eyes

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Boeing 737-700 jet airliner. Credit: Wikipedia/Arcturu

There is no evidence to suggest that lasers pointed at airplane cockpits damage pilots' eyesight. But obviously if directed at critical moments, the dazzle from the beam and ensuing distraction could prove disastrous for crew and passengers, say leading eye specialists in an editorial published online in the *British Journal of Ophthalmology*.

In a bid to disentangle the hype, amid the rising number of cases of [laser pointers](#) directed at aircraft—more than 1500 over the past 12 months in the UK alone—the specialists set out in which circumstances eyesight can be damaged.

There has only been one case of alleged retinal damage in a pilot as a result of laser targeting of aircraft, they say, and that is highly questionable because of the distances involved, which, crucially, would have reduced the energy entering the eye.

The nature and supply of current hand-held lasers have changed substantially in the past decade due to advances in technology and poor quality controls, so that the devices are considerably more powerful, write the authors. But they can only

damage eyes at relatively short range up to several metres, they say.

Between half and one million laser pointers, pens, and key rings are thought to have been in circulation over the past decade.

But while these class 2 pointers on sale to the public predominantly used to produce red laser beams, with an upper limit of 1 milliwatt (mW) of energy—insufficient to damage the eyes—they now produce energy of up to 300 mW. These should be more appropriately classified as class 3B and prohibited from sale to the public, say the authors.

Furthermore, it is very easy to buy cheap laser pointers online with energy outputs of 1000 mW, while devices of up to 6000 mW are available for commercial use, they add.

These class 4 devices are capable of causing irreversible eye damage if directed into the eye from a distance of up to several metres. And some 150 children in the UK are thought to have lost their central field vision as a result.

But when directed to aircraft and helicopters over a long range—typically hundreds to thousands of metres—the beam has to pass through the atmosphere and the cockpit canopy or windshield.

"These are usually pitted or scratched and will serve to scatter the primary beam and may result in the generation of secondary and tertiary beams," write the authors.

"In these situations, pilots tend to self focus on a sudden bright light in the cockpit environment and may be dazzled, resulting in an after-image and almost certainly will be distracted," they write.

"Obviously, if such a distraction occurs at a critical time, such as during landing, the result could be devastating. Fortunately, these exposures are at

irradiances that are incapable of producing irreversible retinal damage even at distances of 100 metres," they continue.

Contrary to popular belief the current safety limits don't need to be changed, say the authors. But the European Commission has asked the relevant European bodies to set a standard for consumer laser products.

"This should allow enforcing authorities to remove unsafe products from the market," they write. But they warn: "However, compliance by manufacturers will remain an issue, as will direct imports by the public purchasing unsafe laser products over the internet."

More information: Eye hazards of laser 'pointers' in perspective, [DOI: 10.1136/bjophthalmol-2016-308798](https://doi.org/10.1136/bjophthalmol-2016-308798)

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