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Expendable Precision Laser Aimer for Shaped Charges

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Expendable Precision Laser Aimer for Shaped Charges

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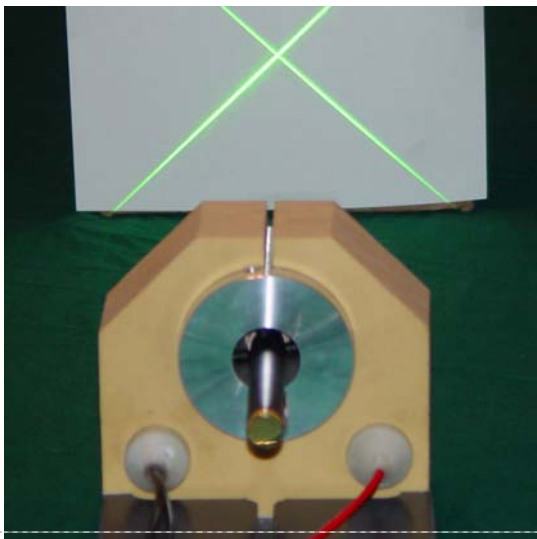


Abstract

Certain shaped-charge cutting operations require a precision aiming system that is operationally convenient, robust, and constructed to allow the aiming system to be left in place for last-minute alignment verification until it is expended when the charge is fired. This report describes an aiming system made from low cost doubled-Nd:YAG 532 nm laser modules of the type used in green laser pointers. Drawings and detailed procedures for constructing the aiming system are provided, as are the results of some minimal tests performed on a prototype device.

Project

Off the shelf green laser modules were modified by adding thermal control for cold weather operation. They were then mounted with precise alignment of the beam to a protective sleeve, with the beam passing through a cylindrical lens to project a line. Two such modules are integrated into a shaped charge mount so that the beams cross on the shaped charge axis, allowing the lasers to be left in place when the charges are fired. A prototype aiming was built that demonstrates that the beam alignment to the charge axis is better than 1 milliradian. Operation was demonstrated down to temperatures of -20F.



Conclusion

The project was completed with FY-07 funding. A prototype aimer was built and tested for beam alignment accuracy and for operation in temperatures down to -20F. No further work is planned for FY-08.