

# Eyesafe Monoblock Microlaser Manufacturing

## PROBLEM / OBJECTIVE

Typical solid-state laser transmitters used in today's military systems incorporate a large number of components, which must be individually fabricated, machined, mounted, and precisely aligned by skilled labor. This labor intensive and time consuming process results in high costs and limited production quantities. As a result, military laser range finders in production are very complex, weigh several pounds, and are costly. In addition, the majority of fielded military platform laser systems are eye-hazardous, which makes training with these systems difficult and dangerous.

## ACCOMPLISHMENTS / PAYOFF

### **Process Improvement:**

The approach taken for this project was an optimization of proven processes that currently existed and the application of existing equipment, tools and technology to reduce the cost of the proven processes. As such, the probability of successfully meeting the stated goals of this project was very high. The low volume production demonstration included in this project produced approximately 250 EMM transmitters for evaluation. The Electro-Optics Center (EOC) provided project monitoring, additional technical support to further enhance the implementation of these improvements. Testing and characterization of the devices was carried out at NVESD.

### **Implementation and Technology Transfer:**

This project was performed at the prime manufacturer level and provided immediate improvements in the manufacture of the EMM transmitters. Lessons learned and technological break-throughs, as appropriate, were reported in a final report, which will provide other manufacturers the opportunity to transfer and utilize these improvements. Process execution and critical parameters will be documented in a form suitable for future training programs



The Eyesafe Monoblock Microlaser (EMM) incorporated into the COBRA Multi-Function Laser.

### **Expected Benefits:**

The project validated the design of the EMM crystal structure, and optimized automated fabrication, assembly, and test processes, and demonstrated low rate production capability. An integrated product and process development (IPPD) approach was used to achieve these goals, resulting in a reduction in the cost of the EMM transmitter by 3X relative to the cost of comparable, currently available, eye-safe laser transmitters. For the Army multifunction laser system, the rangefinder transmitter cost will be reduced by over 65% (\$6.3K to <\$2K) with total projected quantities for new systems over 50,000.

## TIME LINE / MILESTONE

Start Date: August 2000  
End Date: December 2001

## FUNDING

Army ManTech: \$1.00M  
Cost Sharing:  
    VLOC           \$186,300  
    SMC           \$566,371

## PARTICIPANTS

Electro-Optics Center  
Office of Naval Research  
Scientific Materials Corp  
U.S. Army PM, NV/RSTA  
U.S. Army NVESD  
VLOC, a subsidiary of II-VI, Inc.