

# Printed Wiring Board Manufacturing Center

## Laser Projection Imaging

### For High-Volume Production

#### PROBLEM / OBJECTIVE

The need existed for the development of a non-contact, high-density photolithography system for Printed Wiring Boards (PWBs). Direct contact photolithography units were not capable of producing less than 75um lines and spaces. This project sought to demonstrate the capabilities of a non-contact photolithography system for high density interconnect (HDI) boards, developed under a DARPA/SBIR by Anvik Corporation, and productionizing the system for use on a current Rockwell Collin's PWB production line for military boards. The objective of this project was to develop an enclosed and pressurized environment for improved cleanliness, and demonstrate equipment capable of producing less than 75 um lines and spaces at an exposure speed of greater than 5 ft<sup>2</sup> per minute.

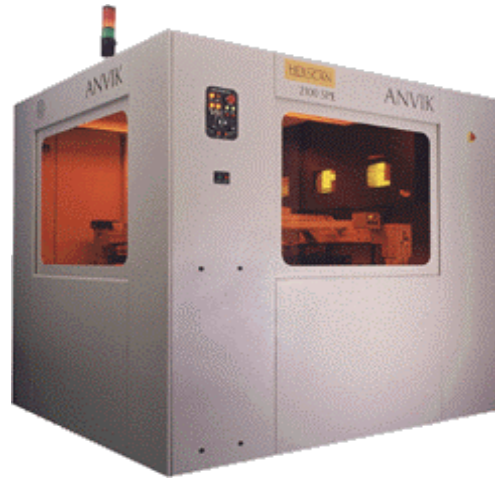
#### ACCOMPLISHMENTS / PAYOFF

**Process Improvement:** A laser non-contact photolithography unit was developed which exceeded the objectives. By developing the non-contact photolithography method many of the problems associated with contact exposure units were eliminated. Yields were also improved.

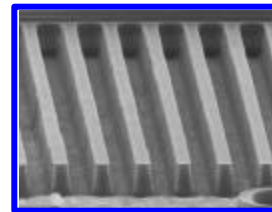
**Implementation and Technology Transfer:** The system was installed at Rockwell Collins, Cedar Rapids, IA in 2001. Rockwell Collins plans to use system to fabricate PWBs for: Joint Tactical Information Distribution System (JTIDS), Army Tactical Missile System (ATACMS) Fiber Optic Data Multiplex System (FODMS), and Modular Azimuth Position System (MAPS). A demonstration of the equipment was provided to industry in October 2001.

#### Expected Benefits:

- Dual-use system for commercial and military use, highest performance of any high-density system available
- Lower cost high-density PWBs for mil applications such as Selective Availability Anti-Spoofing Module (SAASM)
- Faster processing, higher yields available to high-density PWB manufacturers
- Beat performance goals (24"x36" PWB capable, 6 ft<sup>2</sup>/minute capable)



Anvik Photolithography Unit



10 micron lines developed on Anvik HDI Photolithography System

#### TIMELINE

Start Date: July 1999  
End Date: December 2002

#### FUNDING

|                   |          |
|-------------------|----------|
| Army ManTech:     | \$0.125M |
| Cost Sharing:     |          |
| DARPA SBIR:       | \$0.840M |
| Anvik:            | \$0.350M |
| Rockwell Collins: | \$0.235M |

#### PARTICIPANTS

U.S. Army Aviation and Missile Command  
Anvik Corporation  
Rockwell Collins  
DARPA