MicroLED Applications - Microdisplays

Greg Truman, CEO
Forth Dimension Displays
5 June 2020





Kopin Government and Industrial Imaging

Three business units and locations (~120 employees in total)

Kopin Targeting Corporation in Westborough, MA Forth Dimension Displays in Dalgety Bay, Scotland NVIS, Inc. in Reston, VA

Product offerings at multiple levels of integration

LCD, LCOS (in-house) and OLED (with partner) microdisplays

Display modules

Higher Level Assemblies (HLA)

Electro-optical assemblies

End-item products

Wearable, mobile and AR markets

Military

Thermal Weapon Sights and Target Locators – Eyepieces and HMDs

Pilot's Helmets - Microdisplays

Armored Vehicle Displays – Display Assemblies

Rifle Scopes – Display Overlay Modules

Professional

Firefighter Integrated Mask – Display Modules Surgical Systems – HMDs and Video Microscopes

Industrial

Enterprise Wearables – Display Modules

Consumer

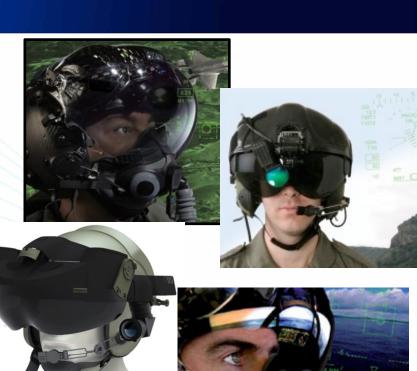
Thermal Scopes – Microdisplays Specialized HMDs – Microdisplays





Pilot Helmet / HMD Applications

- Pioneered use of LCD microdisplay for pilot's integrated helmet mounted display
 - Key component of rotary-wing HMD systems
 - Enabler for fixed-wing HMD systems
- On-going supplier to nearly all operational pilot HMD prime contractors / programs
- First generation systems incorporate monochrome imagery
 - Black and green or black and white
 - VGA to SXGA resolution
 - 30Hz to 60Hz update
- Recent migration to color with limited performance
 - Marginal contrast against bright ambient
 - High power consumption
 - Remains at VGA to SXGA resolution
 - 30Hz to 60Hz update rates





MicroLED Enables Next Generation

- Increased brightness and wide dimming range provides full color imagery under all conditions
 - High symbol contrast against bright daylight ambient
 - Dimmable to low brightness for night operation
 - Significantly improved power and lifetime performance
- Increased switching speeds and high dynamic range support digital night vision
 - 120Hz update rates to minimize sensor image smear
 - Maximizes sensor low light level performance
 - Dynamic range enhances low grayscale visibility
- · High resolution increases system visual acuity
 - 2K x 2K over 40 degrees provides near eye-limiting resolution
- What can we do for you?
 - Understand the microdisplay industry and requirements: One of very few companies in the World that has produced and shipped 10s of millions of microdisplays
 - Backplanes: Successfully designed and produced 100+ different silicon backplanes for LCD, LCOS and MicroOLED
 - Customers and requirements: Have strong, long term customer relationships with companies that need new microdisplays
- What can you do for us?
 - MicroLED arrays

