

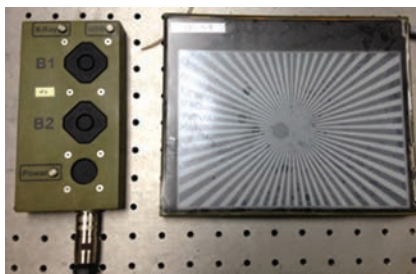
# Manufacturing of Flexible Electronics for Large Area Sensors

## OBJECTIVE/SOLUTION:

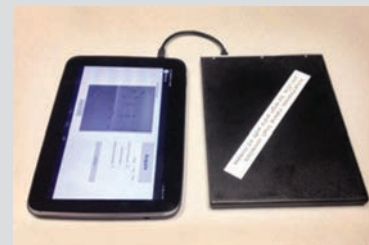
Develop the manufacturing processes for large area thin film transistor arrays and optical sensing to enable integrated light-weight flexible digital X-ray imaging sensors built on plastic. Primary application is for digital radiography (DR) for U.S. Army Explosive Ordnance disposal (EOD) and counter IED.



Panel Tester



Generation 1



6"x6" flexible digital  
X-ray Panel — Android OS

Generation 2

## Achievements:

- Demonstrated World's First integrated flexible 10" X-ray detector for EOD applications with Defense Threat Reduction Agency (DTRA)
- Developed and installed clean room tester for X-ray array testing to improve process yield
- Designed, produced, and tested improved yield and lower defect 8" and 10" thin film transistors (TFTs) arrays and X-ray detectors
- Delivered ten Soldier portable X-ray detector systems being evaluated by Army, SOCOM, OCONUS, and EOD Schoolhouse
- Coordinating program with PEO Ammo/CCS & NAVEODTECHDIV, DOD Lead for EOD Programs of Record
- Demonstrate improved packaging for light weight rugged man portable X-ray system

## Benefits:

- Lightweight, rugged, Soldier portable X-ray systems will improve detection capability for EOD, Counter-IED DOD operations as well as non-destructive test (NDT) dual use applications
- Flexible large area electronic areas may enable new methods for detection for WMD

## Benefits (cont):

- Large area sensors are a building block that will enable new combinatorial methods for chemical and biological sensing
- Development of this technology with commercial partners will result in 60% reduction in system cost to DOD
- Improve performance and yield of thin film transistor arrays at product sizes
- Develop manufacturing processes for large area photodiodes with high gain and low noise
- Partner with commercial manufacturers to transition and demonstrate flexible digital X-ray systems in field environments for Explosive Ordnance Disposal (EOD) and (NDT) to serve both DOD and commercial applications
- Integrated X-ray Toolkit (XTK) software on Android-based tablet compatible with NETT Warrior to control for common analysis for EOD

**Point of Contact:** Army ManTech Manager, U.S. Army Research, Development and Engineering Command (RDECOM), Army Research Laboratory (ARL), ATTN: RDRL-SEE-E, 2800 Powder Mill Road, Adelphi, MD 20783-1197