Aircraft Survivability
Future Capabilities

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GTRI UARC

• GTRI was designated in 1995 as a University Affiliated Research Center (UARC) by the Director of Defense Research and Engineering (DDR&E), Office of the Secretary of Defense (OSD) in order to maintain a long-term strategic relationship with DoD.

• GTRI Competencies
  1) Electromagnetics, Materials and Device Technology
  2) Analysis, Modeling and Simulation, Systems Engineering and Technology Development
  3) Threat Systems Research & Development
  4) Sensors, Weapons, Electronic Warfare and Autonomous Systems
  5) Cyber Security, Information, Communication, Command and Control and Software Systems
  6) Test & Evaluation

• US Army is our Primary Sponsor.
GTRI Spectrum of EW Capabilities

- Threat Projection & Assessment
- Modeling, Simulation & Analysis
- Technology Assessment & Test
- New System Acquisition Support
- T&E Threat Simulation Development
- Tactics & Training
- Advanced Concept Development
- Advanced Technology Development
- Rapid Prototyping & Fielding
- System Sustainment & Modernization
- Developmental T&E, Operational T&E

Supervisor Processor
Technique Doctrine & Optimization Engine

EW Controller

ES/ELINT Kernel
Digital Receiver

EA Kernel
Digital RF Memory

RF Channelizer
Receive Transmit

Technique Decision & Optimization Engine

2-18 GHz RF Transceiver

Band Selector
Power Amplifiers

Supervisor Processor
Technique Doctrine & Optimization Engine

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Band Selector
Power Amplifiers
Future Aircraft Survivability Technologies for Rotary Wing

EO/IR Threat Warning

• Modeling and Simulation for a variety of threat scenarios including EO and Laser sensing

Expendables

• Expendable effectiveness analysis using advanced modeling and simulation tools

RF Countermeasures

• Analysis of current and future RF threats to Army Aviation platforms & countermeasures against these threats
GTRI-Supported Open Architecture Initiatives

The FACE Technical Standard is an open avionics standard intended to facilitate development of systems which are more robust, interoperable, portable, and secure.

The Hardware Open Systems Technology standard is a hardware technical reference framework engineered specifically for portability and scalability across a wide array of platforms.

Functional Architecture for Strategic Reuse is a decomposition of platform capabilities into lower-level, common functional modules which can be used across multiple platforms.

Vehicular Integration for C4ISR/EW Interoperability is a reference framework of architecture, standards, and designs in support of ground platforms.
Future Opportunities for Situational Awareness Integration

**ASE**
- **Mid-Wave Missile Warning**
  - Full-coverage stitched 2 color IR images
  - Day/night operation
  - Potential collision avoidance and obstacle detection
  - Passive ranging

- **Active IRCM**
  - Tasking to augment MWR imaging capability

**DVE Mitigation**
- **LiDAR**
  - High-resolution real-time point clouds
  - Problems w/dust and obscurants

- **MMW Radar**
  - Object detection and ranging
  - Potential all-weather capability
  - Moderate dust/obscurant penetration

- **LWIR**
  - Dust/obscurant penetration for some objects
EW Training Systems - Virtual Electronic Combat Training System (VECTS)

VECTS First Flight in 2004 on C-130
VECTS Second Flight in 2005 on MH-53

- Train Anywhere Anytime
- Augmented Range Training
- Home Station Training

‘Train How You Fight and Fight How You Train’