Intelligence and Information Warfare Directorate Overview

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• I2WD Core Mission Areas
• I2WD Organization Chart
• I2WD Crossing Cutting Functional Areas
• I2WD Technical Thrust Areas
• Cyber Materiel Development Strategy
• Electronic Warfare Roadmap
• Technology Investment Opportunities
**Mission Statement:** Research, Develop and Evaluate ISR, EW and Cyber technologies to provide effective, proactive situational awareness, tracking, targeting and survivability solutions that transition into operational relevant capabilities for the Soldier.
## I2WD Mission Areas

<table>
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<th>I2WD Mission Areas</th>
<th>Force Protection</th>
<th>Offensive Operations</th>
<th>ISR Sensors</th>
<th>Intel Exploitation</th>
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### Intel 2020

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<tr>
<th>Space</th>
<th>Aerial</th>
<th>Terrestrial</th>
<th>Foundation</th>
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- **RADAR**
- **EWAGS**
- **CO2**
- **S/QRC**
- **ISP**

### Intel Exploitation

- **RADAR**
- **EWAGS**
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- **ISP**

**UNCLASSIFIED TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**
• Next Generation Ground Multi-Intelligence
• Multi-Function Airborne ISR (MFAISR)
• Relevant ISR to the Edge (RITE)
• Integrated Air and Ground Survivability
• CYBER, EW, SIGINT (CEWS)
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Next Generation Ground Multi-Int Thrust Area

**Shared Situational Awareness**

**Integrated Ground ISR Platform**

**Shared Purpose**

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**Purpose:**
Utilize experience and expertise to support technical portfolio integration, demonstration risk reduction, and transition.

**Products:**
- Quality Systems Engineering and Program Management
- Existing teaming from within C4ISR CoE for design/fabrication, logistics, software development, information assurance, communications and technical readiness assessment.
- Technical demonstration: Proof of Concept, LBRR.
- Collection, analysis and dissemination of program lessons learned

**Payoffs:**
- Support Army Requirements Oversight Council (AROC) decision to INVEST in Multi-INT capabilities.
- Support I2WD core mission to provide matured technology capabilities to Programs Of Record (POR)

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(U) Vision - Leverage existing COTS/GOTS technology to enhance current ground intelligence capabilities for collection, processing, exploitation dissemination while capitalizing on I2WD internal developmental S&T efforts
Purpose:
Individual sensor modalities have historically been stove-piped, limiting collaboration on multi-sensor platforms. A strategy will be developed for a Multi-Int approach to airborne ISR/RSTA, both at the sensor node and at remote locations. The strategy will encompass all Army airborne manned and unmanned platforms addressing open architecture, modularity, and scalability of the payloads.

Product(s):
- A multi-division Airborne ISR Integrated Product Team
- Technology roadmap for converging architectures of varying sensor modalities
- Sensor Interoperability between labs at I2WD for investigating Multi-Int architecture approaches
- Aircraft Integration Laboratory capable of simulating an multi-int aircraft configuration and environment

Payoff:
- Alignment of future R&D programs at I2WD with a unified multi-int vision
- Risk reduction for anticipated multi-int platforms (ARL-E)
- Transition technology and techniques to Program Offices (PM SAI, PM FW, etc.) for inclusion in Army PORs (Gray Eagle, EMARSS, ARL-E)
Purpose:
Develop an assured, scalable and extended network architecture and a suite of on-the-move capabilities fielded on mounted and dismounted platforms to achieve a robust network and to leverage ISR to provide effective and relevant support to maneuver forces during all phases of unified land operations.

Products:
- Advanced Collection at the Edge
- Robust & Secure Network Transport
- Processing & Dissemination at the Edge
- Relevant Tactical Information /Edge Applications
- Collaboration and Mtd/Mbl/HH Devices at the Edge

Payoffs:
- Situational Awareness to the Edge
- PED at/near the Edge – Organic
- Synchronization with Tactical TOC (BCT) and Strategic Intelligence

(U) Vision - To Inform the development of future Army capability sets, Align S&T Investments across the directorate, and Fulfill capability gaps targeted toward operational trends in the changing threat environment
**Purpose:**
Coordinated and deliberate development of a state of the art suite of effective, interoperable and tailorable survivability capabilities to protect air and ground platforms.

**Products:**
- Advanced components and capabilities designed to counter current and emerging threats to Warfighter platforms
- Interface specifications to facilitate integration of new capabilities into the vehicle architecture
- Data models and transfer framework that enable improved SA through DPED for mission commanders

**Payoffs:**
- Improved system of systems performance, designed to reduce casualties to soldiers and equipment
- Improved SA for commanders
- Reduced timeline for integration of new technologies and capabilities

(UNCLASSIFIED) Vision - Optimize total survivability through integration and coordination of individual systems, groups of systems, and platforms
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I2WD CYBER, EW, SIGINT (CEWS) Thrust

Product:
• Development of a core set of data models for ingestion of CEMA data from multiple tactical sensors at various classification levels.
• New data analytics to identify and correlate Cyber SA events.
• Demonstration of integrated Cyber, EW and SIGINT within tactical DCGS and Mission command infrastructure.

Purpose:
The CEWS thrust area will focus on coalescing various CYBER, EW and SIGINT capabilities into demonstrable integrated solution sets. Initial focus will be on enhancing Cyber SA via tactical assets and integrating and analyzing obtained data in existing DCGS and Mission Command systems. The CEWS thrust area will furthermore serve as I2WD’s primary contribution to the CERDEC Cyber SIGMA Initiative.

Payoff:
• Ability to leverage tactical assets to significantly augment Cyber SA for the tactical commander.
• Ability to leverage tactical assets to enable Cyberspace Operations.
• Ability to maintain near real time awareness of operation environment to include BDA of ongoing missions.
Army Cyber Materiel Development Strategy
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Army Materiel Cyber Strategy
Basic Structure

- Army Cyber Mission
- Required Capabilities & Gaps
- Mission Execution TTP’s
- CONOP

- Cyberspace as a Domain
- Cyber Environment decomposition
- Projected technology trends

- Materiel Acquisition Strategy
- S&T Investment plan & roadmaps addressing all aspects of DOTMLPF required to achieve stated vision

UNCLASSIFIED TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.
Multi Function Electronic Warfare
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MFEW Technical Development Phase

- Collaboration
  - Government
  - Industry
  - International Partners

- Critical Technology Evaluation Analysis & Maturation

- Analysis & Demonstrations

- Technology Maturity Agreement

- TRL 6 Transition to PM EW

CDD CONOPS Analysis
Technology Investment Opportunities
Situational Awareness

DF/GEO Techniques
CREW Compatible Sensing
Distributed Multi-Sensor Fusion
Theater Net-centric Geolocation (TNG) Interface

Techniques (Deny / Degrade / Disrupt)

Techniques Optimization (EA/ES) – Commercial and Military Communication Protocols
Distributed / Collaborative EW
High Effectiveness/High Efficiency EA Techniques

Hardware

SDR Technology – Rapid Maturation and Transition of EW Capabilities to the Soldier through DoD endorsed SDRs deployed within the current force structure
Processing Advancements - FPGAs, GPPs, DSPs
Component Improvements – Amplifiers, Antennas…
Architecture (HW/SW)
  Modular, Open and Scalable Architecture Designs and Specifications
  EW Networking Specification – Standardized network interfaces between EW systems and EW Management Software
  Scheduling and Resource De-confliction

Cyber/EW
  EW Enabled Cyber
  Integrated Cyber/EW

Interference Mitigation
  Suite of Interference Mitigation Techniques