Australian Government
Department of Defence
Defence Science and Technology Group

UNCLASSIFIED

National Security and Intelligence, Surveillance & Reconnaissance Division

Partnerships Week
2016
National Security and Intelligence, Surveillance & Reconnaissance Division

National Security and ISR (NSI) Division undertakes internationally-recognised research and development into technologies aimed at enhancing the national capability to produce accurate, relevant and timely actionable intelligence for both Defence and national agency decision makers.

The research spans the range of advanced sensing and sensor processing through to the design of information integration architectures.

- National Security
- Intelligence Systems
- Intelligence Analytics
- Information Integration
- Surveillance and Reconnaissance Systems
- High Frequency Radar
National Security Science and Technology Centre

The National Security Science and Technology Centre coordinates and fosters the development of science and technology (S&T) to enhance Australia's national security.

Our roles include:
- leading and coordinating the development and implementation of national security S&T policy;
- fostering international national security research collaborations;
- strategic analysis of national security priorities and resourcing; and
- integration of counter-terrorism technologies to benefit Defence and civilian agencies.

NS S&T Priorities:
- Cyber and electronic security
- Intelligence exploitation
- Border security and identity management
- Preparedness, protection and incident response
- Investigative support and forensics

Our S&T Thrusts:
- Computer Operations
- Advanced Analytics
- ChemBio Defence
- Biometrics
- Energetic Materials
- Countering Violent Extremism
Intelligence Systems

Goal
To support the Geospatial Intelligence (GEOINT), Measurements and Signatures Intelligence (MASINT) and Multi-INT capability objectives of Defence and National Security organisations.

Impact
- Advance imagery-based sensing and persistent surveillance
- Automation architecture for the community providing computer assisted processing & exploitation to address the data deluge
- Multi-source ISR integration
- Biometric capabilities to support secure boarders
- Capability transition to partners & operations

Partnerships & Outreach

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Information Integration

**Goal**
To demonstrate advanced ISR integration concepts, including sensing technologies, exploitation algorithms and enterprise integration approaches

**Impact**
- Exploitation of advanced sensing technologies including transition to AEW&C; JORN; Intel agencies
- Automated sense-making from large heterogeneous ISR data
- Modelling, designing and trialling exemplar enterprise ISR integration systems for the ADF
- Capability acquisition methodologies for complex systems
- Definition of search area for MH370
- Exploratory space systems

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**Surveillance & Reconnaissance Systems**

**Goal**
To provide Australia with a sustainable surveillance and reconnaissance edge:
- Radar signature prediction, measurement, treatment plans and exploitation
- Microwave radar systems
- Surveillance modelling and analysis

**Impact**
- Wedgetail operational performance improvements.
- Enhanced electronic protection in current and next generation ADF radar systems.
- Sustainment of ADF radar signatures

**Partnerships & Outreach**

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**Microwave Radar Systems**

**Surveillance Modelling & Analysis**

**Radar Signatures & Phenomenology**
Intelligence Analytics

Goal
Apply scientific discipline of Analytics to enhance the intelligence analysis capabilities of Defence, National Security and Law Enforcement agencies.

• Data analytics is a scientific discipline relating to the extraction, fusion and dissemination of meaningful content from data
• Multi-disciplinary field drawing on Computer Science, Mathematics, Linguistics, Psychology and the Social Sciences

Impact
• Provide tailored advice, develop and transition advanced analytic technologies to INT analysts
• Support to operations and participation in international research programs (e.g., Square Dance, TTCP)
• SNA tool integrated with UK IC capability and provided to AS Govt
• Bidirectional exchange of language technology & resources with, and courted for collaboration by, US IC

Partnerships & Outreach

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High Frequency Radar

**Goal**
Conduct R&D into high-frequency over-the-horizon radar to enhance and sustain Australia’s wide-area air and surface vessel surveillance capability.

**Impact**
- R&D transitioned to capability with extended coverage, improved detection sensitivity, clutter and interference rejection, EW suite.
- Developed specialised equipment design options.
- Providing system design and assessment; modelling; experimentation and demonstration. Including concepts for new radar design and high-fidelity instrumentation aiming for significant detection sensitivity and persistence improvement.
Strategic Research Initiative: Space Systems

Intelligence Systems MSTC
- Niche sensing and characterising the low earth orbit space environment

High Frequency Radar MSTC
- JORN Calibration

Universities/CRC
- UNSW, Sydney & Canberra
- ANU,
- University of Queensland
- Curtin University

Industry
- EOS
- General Dynamics (NZ)
- BAE Systems

International
- Square Dance
- SST Data Sharing Agreement
- TCP ISTAR, SEEP MOU

Develop and demonstrate capabilities to assure ADO continued access to space systems, the data and services they provide
Strategic Research Initiative: Integrated ISR Systems

**Intelligence Analytics**
- Multi-INT
- Big data methods
- Intelligence exploitation tools

**Intelligence Systems**
- WASABI, Analysts Detection Support System
- DEAP and Ground Based Systems

**Information Integration**
- ELIXAR DGS-AUS exemplar
- Geospatial information infrastructure

**Surveillance Reconnaissance Systems**
- Long range Passive Coherent Radar

**Universities/CRC**
- Adelaide Uni
- D2D CRC

**Industry**
- Rheinmetall
- Hawker Pacific

**International**
- Square Dance, Air & Space (ANSR)
- TCP ISTAR
- C3I AAMOST
Thankyou