

DST is structured around Major Science and Technology Capabilities (MSTC). Each MSTC consists of people, science and technology knowledge, infrastructure, and partner relationships within an area of science and a defence domain.

DST aims to be a national leader in safeguarding Australia by delivering scientific advice and innovative technology solutions for Defence and National security. To achieve this, it is essential DST maintains capabilities that meet best-practice in scientific, technical, professional and governance standards.

## EXTERNAL REVIEW

In 2015, DST instigated a quadrennial external review process of benchmarking the performance of its MSTCs to help assure quality. Each review is conducted by a panel of experts drawn from eminent scientists and industry leaders from around the world. Each review panel typically spends five days with an MSTC, touring the laboratories, gaining deeper understanding of the science and the client program and holding discussions with the Research Leader, heads of group and members of the MSTC.

The review panel is requested to identify any world-leading and world-class capabilities that exist in the MSTC. Those areas which have been identified as world-leading or world-class are shown within.

# DOING BUSINESS WITH DST

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### For further information

visit [www.dst.defence.gov.au](http://www.dst.defence.gov.au) or  
download the free DST App



# World-class Defence Science and Technology Capabilities

**DST** Science and Technology for Safeguarding Australia





# World-class capabilities

## MARITIME DIVISION

Enhances ADF operations in the maritime domain through expert advice and solutions.

- Acoustic signature prediction tool
- Cavitation Research Test Facility
- CO2 capture via liquid-ion technology
- Composite prototyping
- Computational Fluid Dynamics cluster
- Control room concepts and optimisation
- Corrosion Science
- Development of tracking algorithms
- Electromagnetic signature control
- Environmental signature control
- Fibre optic acoustic array sensors
- Forensic investigation into ship fires
- Heavy Weight Torpedo development
- Hydrodynamics of high-speed slamming/ multi-ship hydrodynamic interaction
- Integrated Survivability
- Lithium-ion battery research
- Mine Warfare Effectiveness Modelling
- Multi-static sonobuoy research
- Payload autonomy
- Power and energy systems 'hardware-in-the-loop' simulation
- Ship and submarine material evaluation
- Ship structural monitoring
- Specialised coatings
- Stress corrosion cracking
- Submarine sonar system modelling
- Target Echo Strength research
- Underwater explosive test and modelling capability



## LAND DIVISION

Provides support and solutions for ADF land capabilities by applying expertise in human sciences, vehicle and system sciences, personnel protection and chemical, biological and radiological defence.

- Advanced food processing
- Aerosol Science
- Blast and ballistic modelling
- Chemical Analysis and Synthesis Facility
- Diggerworks: Soldier Centred Design
- Distributed simulation of combat
- Environmental test facility
- Epidemiological modelling
- Field based human-system assessment
- Level 3 biological facility
- Nutrition capability
- Nutrition for military performance enhancement
- Physical Employment Standards
- Sleep loss and operator stress resilience
- Social marketing for eating behaviour

## AEROSPACE DIVISION

Provides support and solutions to enhance the operational effectiveness, performance, survivability, availability and safety of ADF aerospace capabilities.

- Advanced composite technologies
- Aircraft performance modelling and simulation
- Forensic capability
- Full-scale fatigue testing
- Health and usage monitoring systems
- Infrared signatures research
- Integration of electronic warfare modelling within live virtual construction capability
- Microbolometer Infrared Thermoelastic Stress Analysis System
- Night Vision Laboratory
- Quantitative Fractography
- Shape and re-work optimisation
- Short-crack threshold modelling
- The White Force Multiplier work within Live Virtual Construction Capability
- Thermal stress analysis

## JOINT AND OPERATIONS ANALYSIS DIVISION

Undertakes rigorous, scientifically-based analysis of Defence operations and capability to provide independent, impartial, timely advice.

- Agent based team tactics as implemented in Air Combat Environment
- Cognitive work analysis
- Emerging Disruptive Technology Assessment Symposia
- Headquarters Joint Operations Command Operations Analysis engagement
- Joint Organisational and Social Science
- One-on-one submarine operational analysis
- Risk analysis
- Training system modelling and analysis
- Vital Planning and Analysis Tool
- Wargaming capability – jSWAT capability

## NATIONAL SECURITY INTELLIGENCE SURVEILLANCE AND RECONNAISSANCE DIVISION

Enhances the national capability for accurate, relevant and timely actionable intelligence for Defence and Government decision makers.

- All Source Analytics
- Analyst detection support system
- Aspect of Language and Fusion
- Biometrics
- Data and information fusion and target tracking
- Field testing expertise
- High Frequency Auxiliary Systems
- High Frequency Radar design and implementation
- Inverse Synthetic Aperture Radar imaging
- Ionospheric research
- Multi-mode radar system
- Passive radar
- Sea clutter modelling
- Small satellite program
- Social Influence
- Virtual Laboratory

## CYBER AND ELECTRONIC WARFARE DIVISION

Provides expert advice and technology solutions in the cyber domain and electronic warfare environment.

- Active security technologies and trustworthy systems
- Atmospheric modelling and measurement of radio frequency propagation
- Automated analytics and decision support for cyber mission assurance
- Co-site interference suppression
- Counter Improvised Explosive Device program
- Cyber and crypto mathematics research
- Distributed Electronic Warfare including multiple platforms and resource management
- Electronic intelligence and electromagnetic spectrum signal analysis
- Electro-optic Hardware-in-the-Loop Facility
- Electro-optic modelling and simulation
- Eye safe laser attention device
- High power fibre lasers
- Integrated Survivability Assessment Facility
- Laser Optical Counter-surveillance System
- Malware analysis
- Navigation warfare capability development
- Next generation infrared countermeasures laser development
- Photonics
- Radio frequency integrated circuit components and workflow techniques
- Satellite communications waveform development
- Signal analysis
- Specialised waveforms
- Survivable networks
- Wideband multi-channel/multi-aperture processing
- Wideband/ultra-wideband digital intercept receiver
- Wireless cyber

## WEAPONS AND COMBAT SYSTEMS DIVISION

Applies science and technology to the development and operation of highly effective weapon and combat systems for Defence.

- Blast modelling capability
- Counter Improvised Explosive Device capability
- Explosive Ordnance Disposal capability
- Gaseous ignition capability
- Instrumented high explosive firing facilities with flash x-ray
- Joint Strike Fighter air battlespace management system/situation awareness work
- Maritime Human and Autonomous Decision Making work
- Materials characterisation capability
- Non-lethal Weapons capability
- Pyrotechnics
- Rocket motor test facility
- Service life assessment of munitions including rocket motors
- Standoff explosives detection capability development
- Wedgetail support including WIRE and Auto ID

