

SINGAPORE DEFENCE TECHNOLOGY SUMMIT

27-29 June 2018

22 June 2018

Fact Sheet

VISITS TO TECHNOLOGY CENTRES

With its strong focus on promoting knowledge exchange and sharing the possibilities of applied science and engineering, the inaugural Singapore Defence Technology Summit will include visits to some of Singapore's hi-tech facilities that provide first-hand insights into the exciting innovations and initiatives that are shaping our nation's development.

They are:

- Campus for Research Excellence and Technological Enterprise (CREATE)
- DSO National Laboratories
- Littoral Mission Vessel
- Port Operations Control Centre
- Singtel's Future Now Innovation Centre
- Smart Airbases of the Future
- ST Engineering
- Woodlands Checkpoint

Campus for Research Excellence and Technological Enterprise (CREATE)

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The Singapore-MIT Alliance for Research and Technology (SMART) is a major research enterprise established by the Massachusetts Institute of Technology (MIT) in partnership with the National Research Foundation of Singapore (NRF) since 2007. SMART is the first entity in the Campus for Research Excellence and Technological Enterprise (CREATE) developed by NRF.

SMART serves as an intellectual hub for research interactions between MIT and Singapore. Cutting-edge research projects in areas of interest to both Singapore and MIT are undertaken at SMART. SMART comprises an Innovation Centre and five Interdisciplinary Research Groups (IRGs): Antimicrobial Resistance (AMR), BioSystems and Micromechanics (BioSyM), Disruptive Technology for Agricultural Precision (DiSTAP), Future Urban Mobility (FM) and Low Energy Electronic Systems (LEES). SMART research is funded by the National Research Foundation Singapore under the CREATE programme.



DSO National Laboratories

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As Singapore's largest defence R&D organisation, DSO National Laboratories (DSO) develops cutting-edge technology to strengthen the nation's defence capabilities and national security.

It houses Singapore's only High Containment Facility, which undertakes the mission of receiving, testing and verification of unknown Chemical, Biological, Radiological and Nuclear samples. The labs are certified by the Organisation for the Prohibition of Chemical Weapons, United Nations, and a member of the International Atomic Energy Agency network.



It also includes the Robotics Lab – the first of its kind in Singapore – a one-stop facility that enables prototyping, integration, simulation and testing of robotic systems prior to field trials. Focused on making its unmanned systems smarter and faster, the Robotics Lab brings together multi-disciplinary engineers to develop new capabilities.



Littoral Mission Vessel

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Built and designed in Singapore, the Littoral Mission Vessels (LMV) are "uniquely Singapore". The eight LMVs will replace the Republic of Singapore's (RSN) Fearless-class patrol vessels, which have served the RSN faithfully for about 20 years. Smarter, faster, and sharper, the LMVs are highly capable warships designed and equipped with advanced combat capabilities and technologies to further strengthen the RSN's ability in the seaward defence of Singapore and protecting our sea lines of communication.

The LMVs are designed with an Integrated Command Centre, which co-locates the ships' Bridge, Combat Information Centre and Machinery Control Room. Numerous sense-making and decision support systems, complemented by a high level of automation in the ship, are incorporated into the LMV's combat and platform suite. Versatile, the LMVs can be quickly configured with mission modules to take on a wide spectrum of operations, and they can also be deployed with unmanned systems for surveillance or mine countermeasure operations. The LMVs are equipped with both lethal and non-lethal options to deliver calibrated responses to deter or defend a wide range of threats.

Smarter. Faster. Sharper.

The Republic of Singapore Navy's (RSN's) new Littoral Mission Vessels (LMVs) are smarter and faster ships, equipped with sharper capabilities. They will strengthen the RSN's ability to ensure the seaward defence of Singapore and protect our sea lines of communication.

SHIP CHARACTERISTICS

Length:	80m
Beam:	12m
Draught:	3m
Displacement:	1,250 tonnes
Speed:	In excess of 27 knots
Endurance:	3,500 nautical miles (up to 14 days)
Baseline complement:	23 crew members

SMARTER SHIP

INNOVATIVE OPERATING CONCEPTS
 Integrated and centralised operation centre – comprising the Bridge, Combat Information Centre and Machinery Control Room – boosts effectiveness and efficiency, especially for maritime security operations (see inset).

INNOVATIVE LOGISTICS & ENGINEERING DESIGN
 Optimised logistics and engineering operations by designing the LMVs around these support processes.

ADVANCED SENSE-MAKING & DECISION SUPPORT SYSTEMS
 Numerous sense-making and decision support systems with a high level of automation allow for a leaner crew.

NETWORK-CENTRIC DESIGN
 Advanced and integrated communication & network system enables crew to communicate and share information on board and with subject matter experts ashore.

FASTER SPEED

Capable of speeds in excess of 27 knots and can support a medium-lift helicopter and rigid hull inflatable boats that allow for rapid response to maritime security incidents. Greater endurance and ability to stay at sea for longer periods of time.

SHARPER CAPABILITIES

GREATER VERSATILITY
 Configurable with different mission modules to cater to a wide spectrum of operations.

CALIBRATED RESPONSES
 Equipped with lethal and non-lethal options to deliver calibrated responses to deter and defend against a wide range of threats.

HIGH-RESOLUTION SENSORS
 Advanced radars and sensors and a 360° bridge provide all-round visual awareness of surroundings in congested waters.

INTEGRATED COMMAND CENTRE

The co-location of the LMV's Bridge, Combat Information Centre and Machinery Control Room, known as the Integrated Command Centre, integrates and synergises the management of navigation, engineering, and combat functions. It also features windows on all sides, providing the crew with a 360° direct line-of-sight view.

SHIP CHARACTERISTICS CALLOUTS:

- KELVIN HUGHES SHARPEYE NAVIGATION RADAR
- STEALOP (COMRANS D) ELECTRO-OPTIC DIRECTOR
- THALES NS700 3D SURVEILLANCE RADAR
- STEALOP 360° ALL-ROUND SURVEILLANCE SYSTEM
- OTO MELARA 12.7MM HITROLE GUN
- RAFAEL 25MM 719900N GUN
- MBSA MICA ANTI-AIR / ANTI-MISSILE MISSILE SYSTEM
- SUPPORT MEDIUM-LIFT HELICOPTER
- OTO MELARA 76MM GUN
- LAUNCH AND RECOVERY SYSTEM FOR RIGID HULL INFLATABLE BOAT
- REMOTE CONTROL LONG RANGE ACOUSTIC DEVICE INTEGRATED WITH XENON LIGHT
- WATER CANNON SYSTEM

DECK LAYOUT CLUSTERS:

- Engineering Cluster
- Navigation Cluster
- Command Cluster
- Surveillance Cluster
- Weapon Cluster
- Network Cluster
- Mission Module Cluster

LEGEND:
 ■ CALIBRATED RESPONSES
 ■ HIGH-RESOLUTION SENSORS

Port Operations Control Centre

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Located along a vital shipping lane, Singapore is one of the world's busiest ports. The Maritime and Port Authority of Singapore operates two port operations control centres (POCC) to ensure navigational safety, efficient management of vessel movements and the protection of the marine environment in Singapore's port waters and the Singapore Strait.

The POCCs include four key stations: Vessel Traffic Information System (VTIS), Marine Safety Control Centre (MSCC), Port Security Unit (PSU) and the Maritime Rescue Coordination Centre (MRCC).

VTIS provides navigational information to ships plying our waters and the Singapore Strait. Using radars and communications systems, it can track up to 10,000 vessels at any one time. MSCC enforces port regulations and responds to marine emergencies. PSU monitors Pre-Arrival Notification messages, Harbour Craft Transponder System and Prohibited Area entry approval. MRCC, equipped with the Global Maritime Distress and Safety System, monitors distress alerts from ships and coordinates search and rescue operations within the Singapore Maritime Search and Rescue Region.



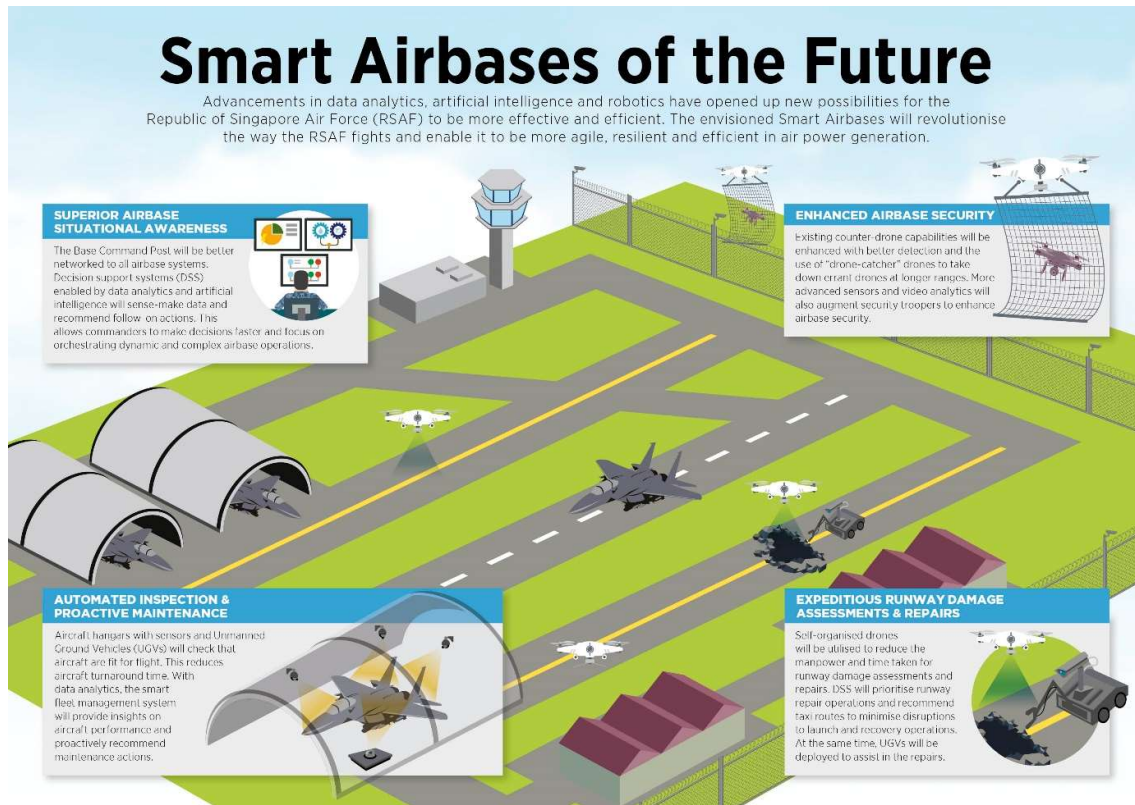
Smart Airbase of the Future

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By leveraging data analytics, artificial intelligence and robotics, Smart Airbases of the future will revolutionise the way the Republic of Singapore Air Force (RSAF) fights by enabling the RSAF to be more agile, resilient and efficient in air power generation. The Smart Airbases of the future will see more automation and unmanned systems in areas such as aircraft inspection and maintenance, airbase security, and runway damage assessments and repairs. The Base Command Post will also be better networked to all airbase systems, and decision support systems enabled by data analytics and artificial intelligence will be used to sense-make voluminous amount of data and provide recommendations for follow-on actions. This allows commanders to make decisions faster and focus on orchestrating dynamic and complex airbase operations.



ST Engineering

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From Smart City ideas to new defence capabilities, ST Engineering will be showcasing a selection of its technology know-how, new and proven solutions, as well as cutting edge defence products from across the aerospace, electronics, land systems and marine sectors.

Some of the Smart City innovations include an Internet-of-Things-enabled Smart Lamp Post that integrates smart sensors and communications technologies; a data-driven next-gen Traffic Management Platform; DroNet, an end-to-end solution utilising an integrated network of drones; TUG robot, an autonomous mobile robot widely deployed in the healthcare, hospitality and manufacturing sectors; and Secure Files Transfer, a solution-Data Diode that protects trusted networks from both malware intrusion and information leakage.

Other new technologies include the digitalised Next-Gen Armoured Fighting Vehicle; counter drone systems; data analytics and predictive diagnostics for ships and the SMART Soldier System for tomorrow's battlefield.





SHADES

Advanced see-through intelligent head-up display system receives real-time information and displays critical augmented reality information to the soldier for improved situational awareness and enhanced mobility



UNMANNED SYSTEM DATA LINK

Secure data link provides manned-unmanned teaming and fire control for collaborative sensing and combat engagement

PROTEC

Lightweight, modular and scalable load bearing vest designed for hot and tropical climates



ACMS LITE

Lightweight C4 communications systems provide comprehensive dismounted situational awareness; Blue Force Tracking and robust connectivity for mounted and dismounted soldiers.



GEAR

Comprehensive combat-effective clothing system suitable for different operational needs



SENSE

Holistic and non-intrusive vital signs monitoring system to enhance soldier training effectiveness whilst minimising exhaustion related injuries



PLATE

Protects the soldier against operational threats regardless of environmental restraint



PORTABLE SENSORS

Ultra-portable sensors allow soldiers to perform stand-off and unattended surveillance as well as intruder detection



ARCTIC

Combination of modular active-cooling vest integrated system and passive-cooling uniform to enhance the efficiency of heat extraction from the body



STRIDE

Use of advanced fabrics and triple-stitched construction for improved breathability and durability



PoEMS-ENHANCED WIRELESS CHARGER

Unobtrusive wireless transmission of power



POWER

High energy density portable system for extended mission endurance



EXOSUIT

A semi-passive exoskeleton designed for improved soldier performance and endurance to support carriage of heavy loads



PACK

Personal carriage kit including standard ammunition and equipment pouches, packs designed for sustainment or operational use



PoEMS-SMART POWER MANAGER

Intelligent power universaliser capable of accessing different energy sources to power Mobile Personal Communication Networks



Woodlands Checkpoint

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The Immigration & Checkpoints Authority is responsible for securing Singapore's borders against the entry of undesirable people and cargo through land, air and sea checkpoints. It ensures that the movement of people, goods and conveyances through our checkpoints is legitimate and lawful. It administers and upholds Singapore's laws on immigration, citizenship and national registration fairly and effectively. It is a member of the Home Team under the Ministry of Home Affairs.

Woodlands Command is one of the two land checkpoints in Singapore. The checkpoint is one of the busiest land checkpoints in the world. Woodlands Checkpoint and the Office of the Chief Science and Technology Officer (OCSTO) jointly implement and deploy emerging science and technology capabilities to address security challenges.



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