



Land Vehicle Survivability

A Layered Approach to Platform Protection

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AOC, Australia May 2008

Vehicle Survivability Context



- High tempo
- High mobility
- High risk
- Asymmetric
- Enduring
- Fast decisions
- Right tools
- Politics



Need for affordable, layered and effective vehicle protection

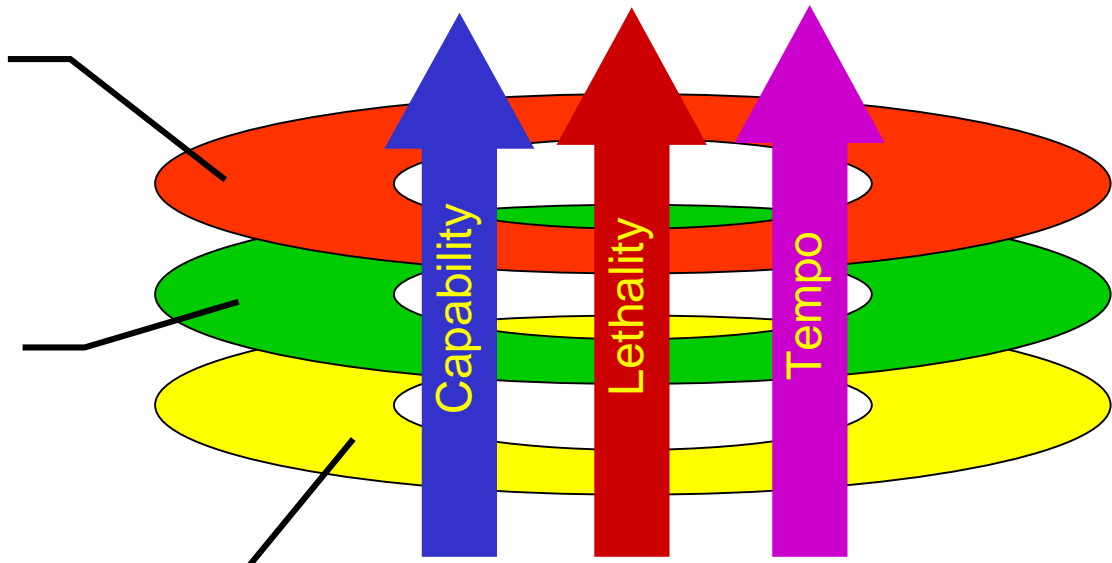
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Survivability Capability Layers

Integrated DAS/LSA
(e.g. MWS & HFI, SoftKill & HardKill systems)

Sophisticated LSA
(e.g. HFI, geo-location of POF, cueing RWS, blue force tracking)

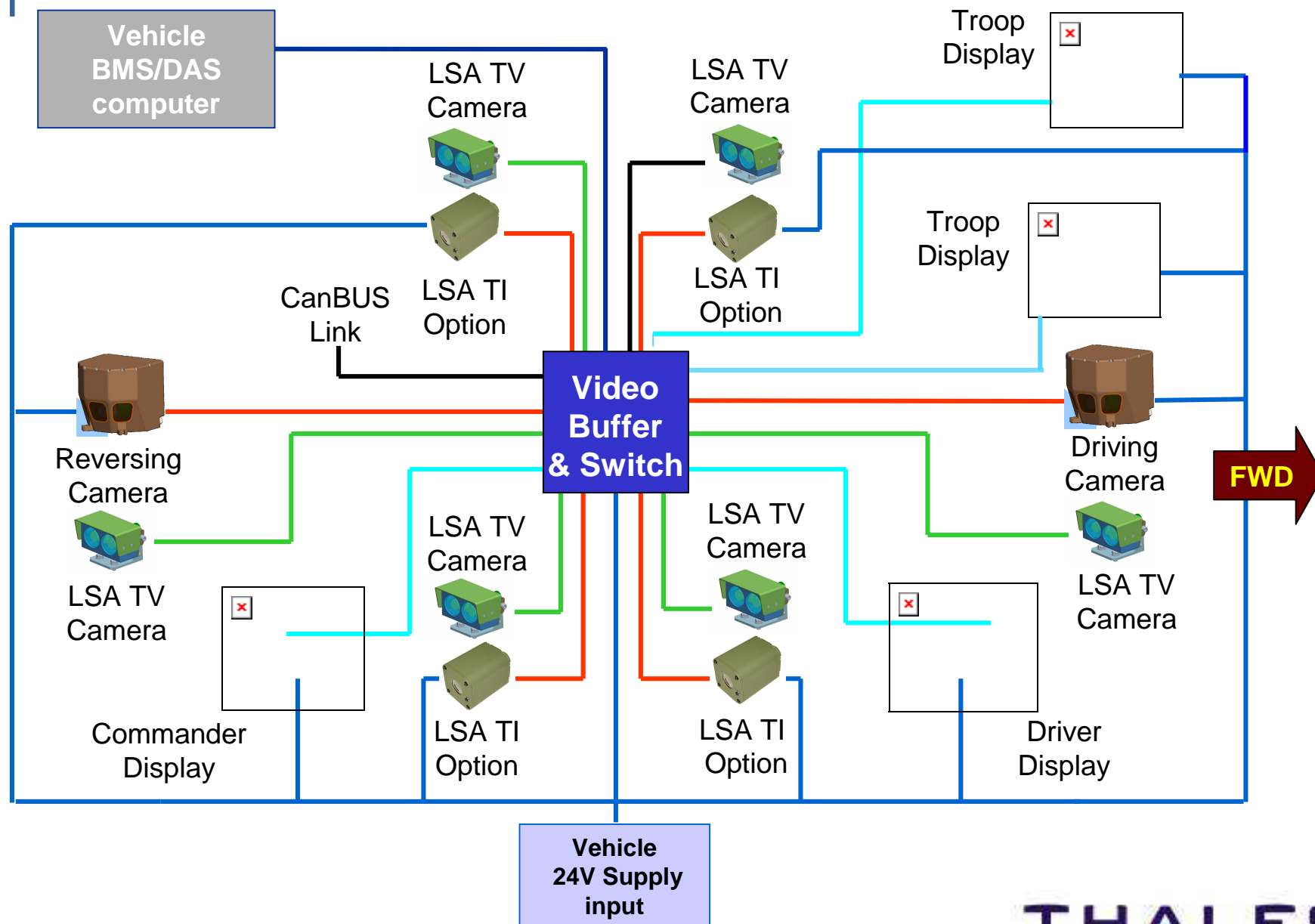
Simple Local Situational Awareness (LSA)
(e.g. images, maps)



Effective Local Situational Awareness (LSA) minimises risk, increases tempo, takes fight to the enemy

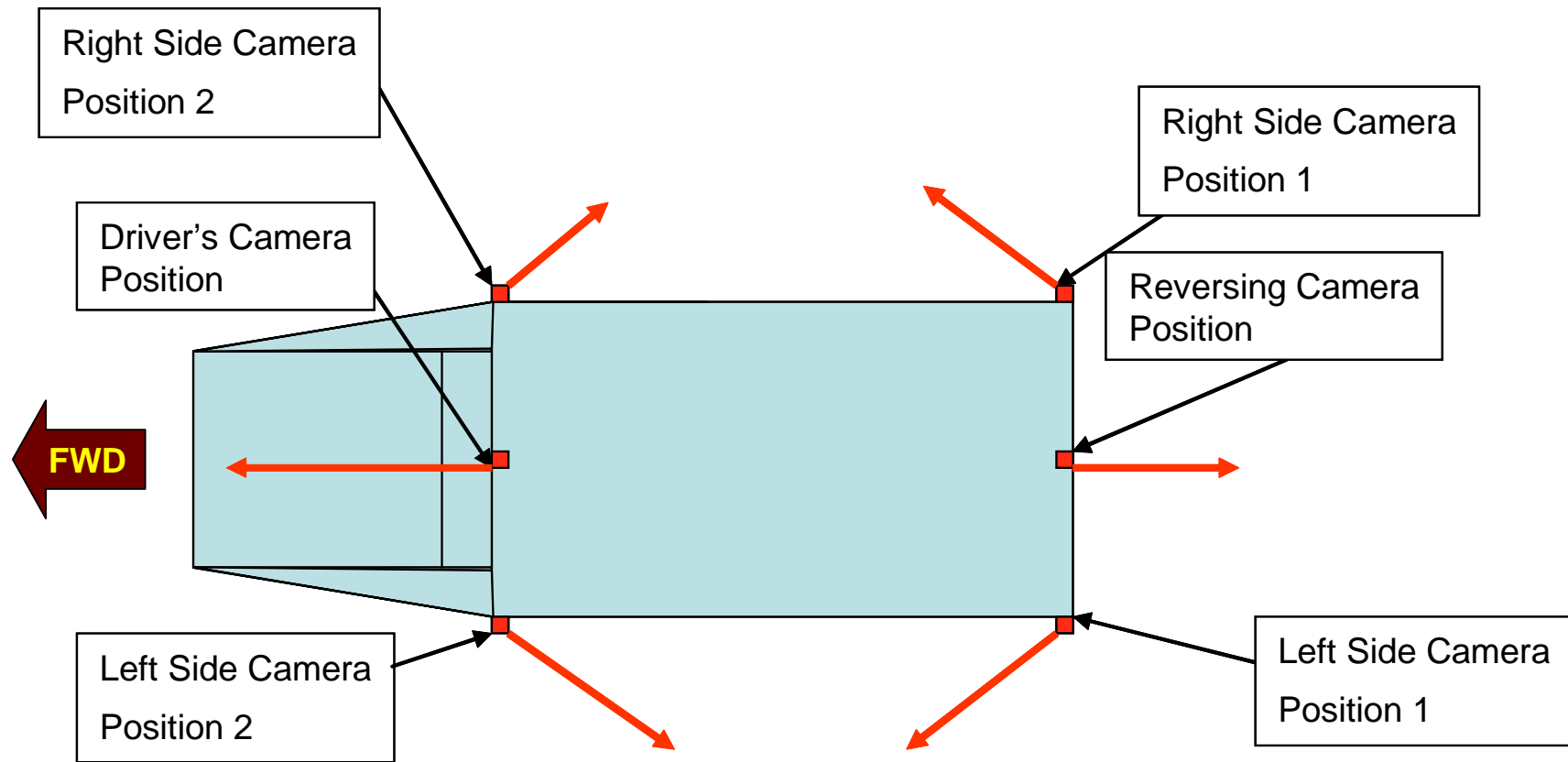
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Vehicle LSA – Typical System Architecture



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Typical LSA Configuration



Mixture of Sensors for Effective, Affordable Protection

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Next Generation IR Threat Warner for MAW & HFI



Capabilities

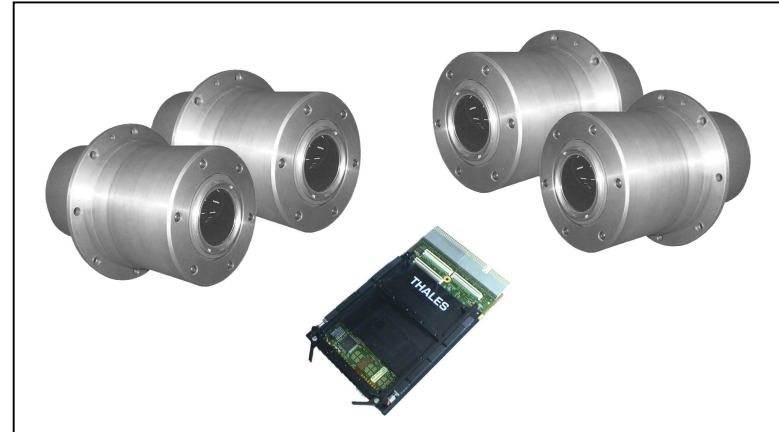
- Enhanced Rotorcraft & AFV survivability against:
 - Guided missiles
 - MANPADS, other SAMs
 - Radar, laser guided & ATGW
 - Hostile fire
 - RPG and other unguided missiles
 - Machine Gun (light and heavy calibre)
 - Sniper fire
 - Local Situational Awareness
 - IR images at close in range

Key features

- Low **False Alarm Rate** declaration of all threat types
- **Single Colour Infra Red** sensor technology
- Enabling capability for smart **Defensive Aids Systems**
- Processing based on 25 years TOL IRST knowledge
- Affordable/enhanced capability replacement for UV warners

Programmes

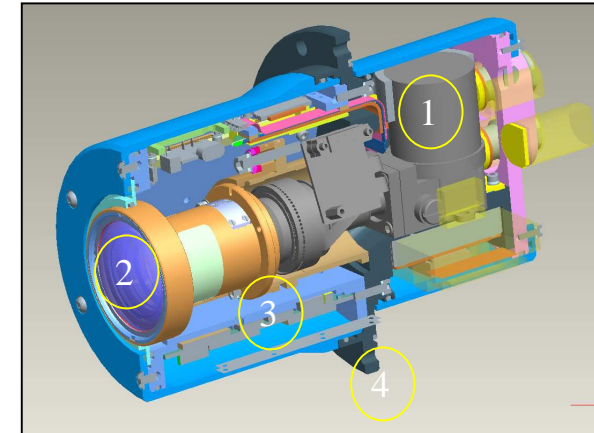
- TOL under contract with SANS & Air EW IPT for TDP development programme December 2006.
- Selected for Australian DoD/DSTO CTD-11 Vehicle Situational Awareness programme
- Selected for French DGA "SoftKill" AFV DAS development programme





Technical characteristics

- Concurrent HFI & MAW capability
- Range performance at capability of each threat type
- Prioritisation across combined HFI & MAW threat library
- 4 sensor fit for full platform protection
 - Wideband Medium Wave (3-5 μ m) sensors
 - Wide Field of View (105° each sensor)
- Interface to Defensive Aid & Battlefield Management Systems
 - Generic Plug & Play interface to multi-sourced DASC
 - Smokes & Chaff & Flare dispensing systems
 - **Directed IR CounterMeasure/Dazzle** systems
 - Dashboard/Cockpit **DAS/BMS** display
- IR sensor provides multi functionality, e.g.
 - **Situational Awareness**
 - **Fire Point Location** (azimuth & elevation)
 - Cueing of sensors and effectors (e.g. Remote Weapon Station)
- Use of COTS modules for maximum flexibility & product growth
 - **Micro Electronic Scalable Architecture** processing electronics
 - **Integrated Detector Cooler Assembly**
- Concurrent HFI & MAW capability



1. IDCA
2. Wide FOV Lens
3. MESA pcbs
4. Platform interface flange



SC IR MAW Technology Demonstrator Programme

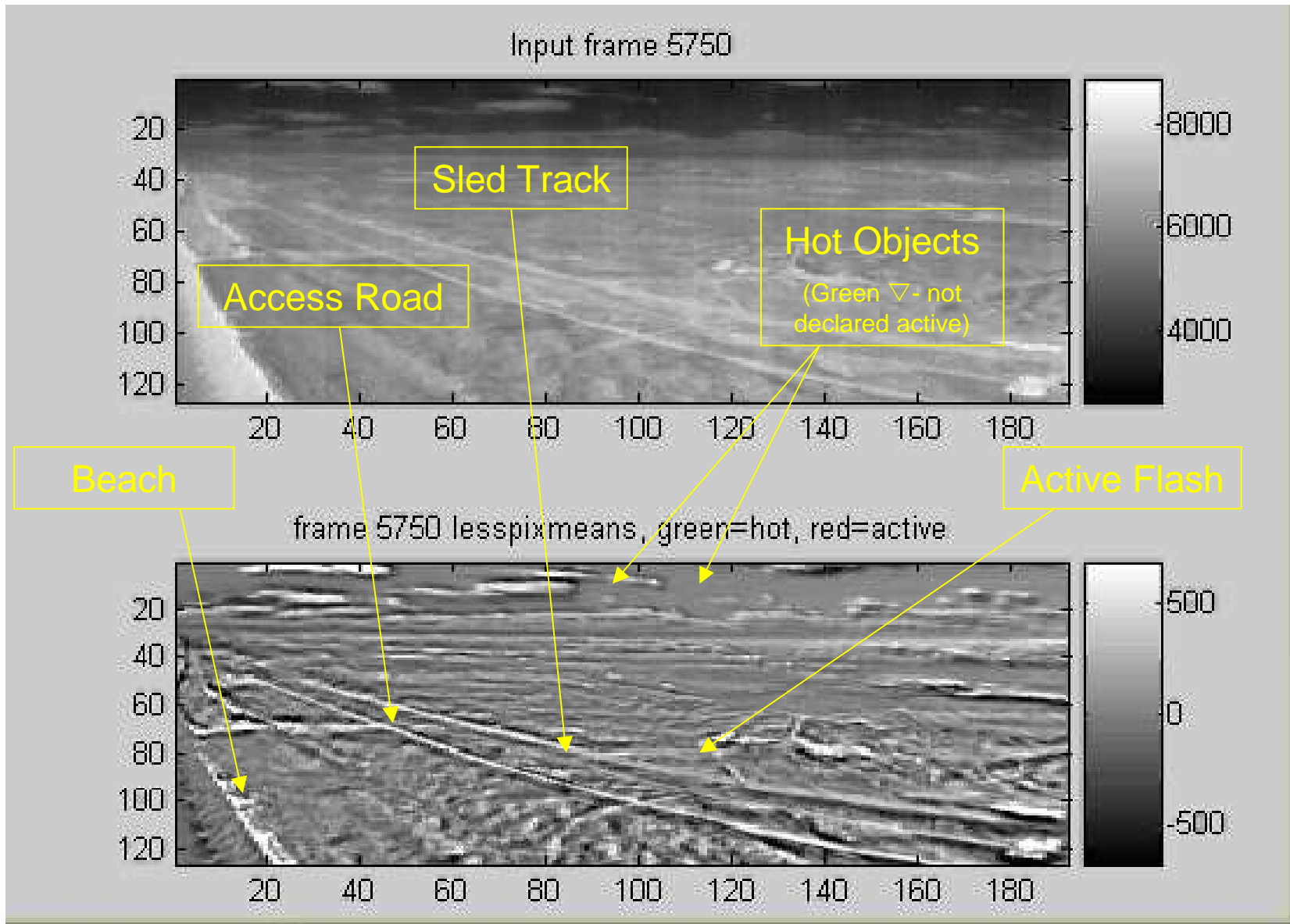
- Under Contract with SANS & Air EW IPT October 2006
- 30 months duration to March 2009
- Technical objectives
 - Real time declaration at TRL7 in both MAW and HFI
 - Productionised, qualified product in March 2009
 - Exploitation of linkages with research & TDP programmes
 - RE518, AATECS PC and C-DAS
- Trials activities
 - Further threat and potential false alarm data collection to mature algorithms
 - System capability trialled and demonstrated
 - AATECS PC programme with Dstl, Selex and QinetiQ



Elix-IR Missile Motor Firing



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Elix-IR HFI Threat Warning System

Bushmaster,

LWC Adelaide 2007

with IR and Acoustic HFI
Threat Warner systems



Elix-IR
HFI Threat
Warner
sensors
(4 qty)

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Possible Implementation, derived from CTD-11 programme

➤ Vehicle Patrol Scenario

- Day/night surveillance with automatic threat alerts (SA) – Elix-IR & PSAMMS
- Detect sniper fire/other hostile fire (HFI) source (e.g. mortar fire)
- Establish level of threat
- Cue remote weapon station onto target
- Engage threat/advise other fire teams
- Share images from on-board cameras in NCW battle space (IoD)

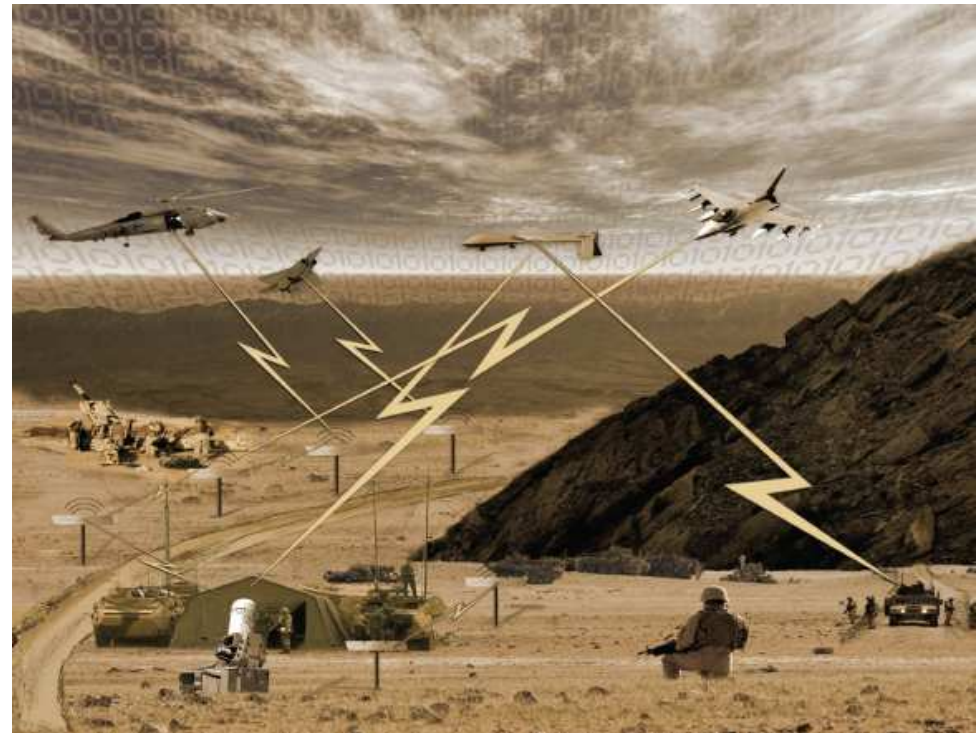


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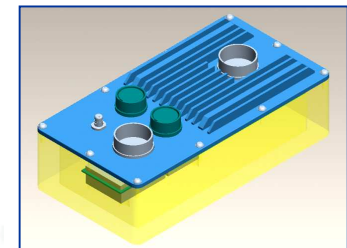
NEC 2 from Imagery on Demand (IoD)

Imagery on Demand (IoD) – *Enabling NCW*

- Thales has developed a tactical image dissemination system, known as IoD.
- It has been on trial with the Australian forces during March 08 and results to date prove that the system meets the required military need to pass geo-referenced images and video over a low bandwidth tactical radio, such as the MBITR.
- Originally developed for the UK Watchkeeper UAV Programme the ongoing PV development work miniaturises the unit for the mounted soldier environment and adds additional functionality.



Current generation
Trials Kit



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- Next generation of vehicles are lighter, less armoured
- Emerging technology available to enhance vehicle survivability
 - IR threat warning, Imagery on Demand
- Elix-IR technology selected for Australian DSTO CTD survivability enhancement programme
- Elix-IR is a significant mid – high end capability addition to layered Local Situational Awareness
- Rapid Acquisition has the near term potential to deliver both HFI & MWS functions, together with IoD to provide:
 - Significantly enhanced troop safety
 - Reduced Sensor to Shooter timelines
 - Increased tempo through genuine NCW 2 capability