




Sensorial microsystems for soldier systems

Koos Meijer
Eindhoven, 11 October 2005

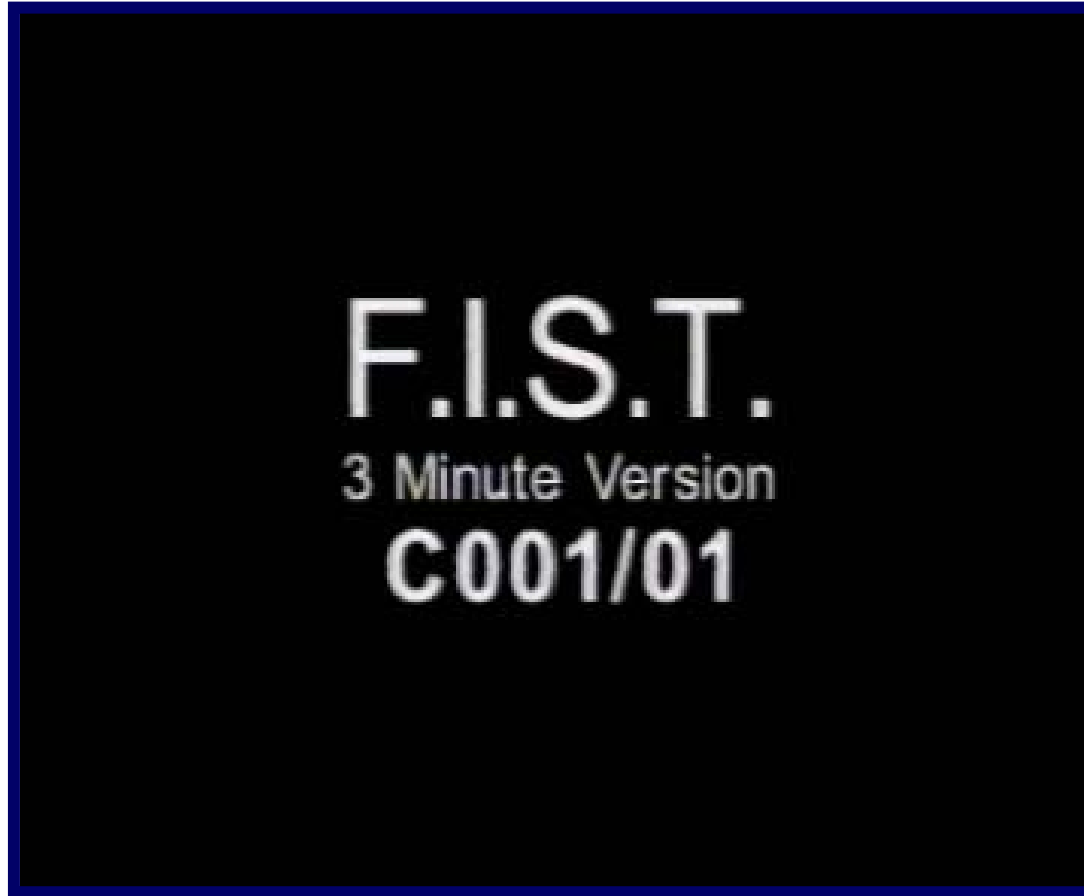
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- **Introduction**
 - **Thales in a short overview**
 - **Soldier Modernisation Activities**
 - **NATO/NAAG/Land Group 1**
 - **Capturing Key Issues**
 - **Sensors for a Soldier System**
 - **The (near) future**
 - **Summary**

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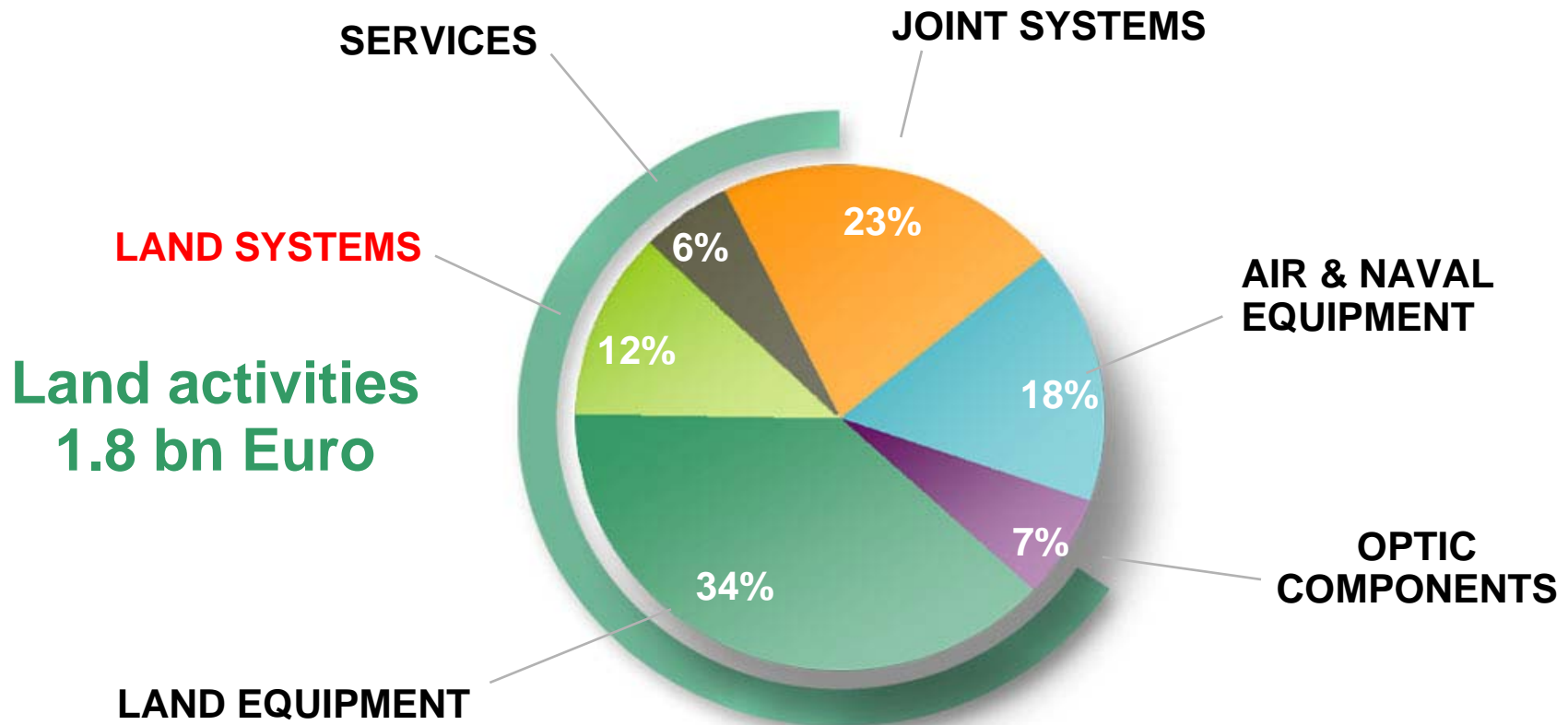
- **LtCol Rtd RNLA since 010105**
- **Former Program Leader Soldier Modernisation Programme RNLA (010197 – 011104)**
- **Deputy chairman NATO/NAAG/TG/1 (LG/1) (011100 – ongoing)**
- **Consultant (010205 – ongoing)**

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Land & Joint Systems 2004 sales: 2.5 billion Euro



Land & Joint Systems
A world leader and only player in Europe with all capabilities

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Thales Land Systems Overview

■ Cooperative Land Systems

■ Vehicle & Soldier Systems

■ Armament



■ Cooperative Fighting Systems (close & long range combat systems)

■ Tactical Recce & Surveillance Systems

■ Unmanned Systems (UGV & micro / mini UAV)

■ Battlespace Digitisation Systems

■ Vehicle Systems

■ Soldier Systems

■ Short & Long Range Fire Systems

■ Fire Support Systems

■ Deep Strike

■ Local Area Control & Counter Mobility Systems

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The Soldier Modernisation activities are:

- Related to the enhancement of the importance of the individual soldier as **a person** and as **a platform**
- Governmental or industrial driven
- In most of the nations three services oriented
- A long-term process
- Spin off to other disciplines like home guards, police and fire brigades



Soldier Modernisation Activities are related to the Soldier's spectrum of Operations

Domestic Support

- Disaster Relief
- Civil Support

Peace Operations

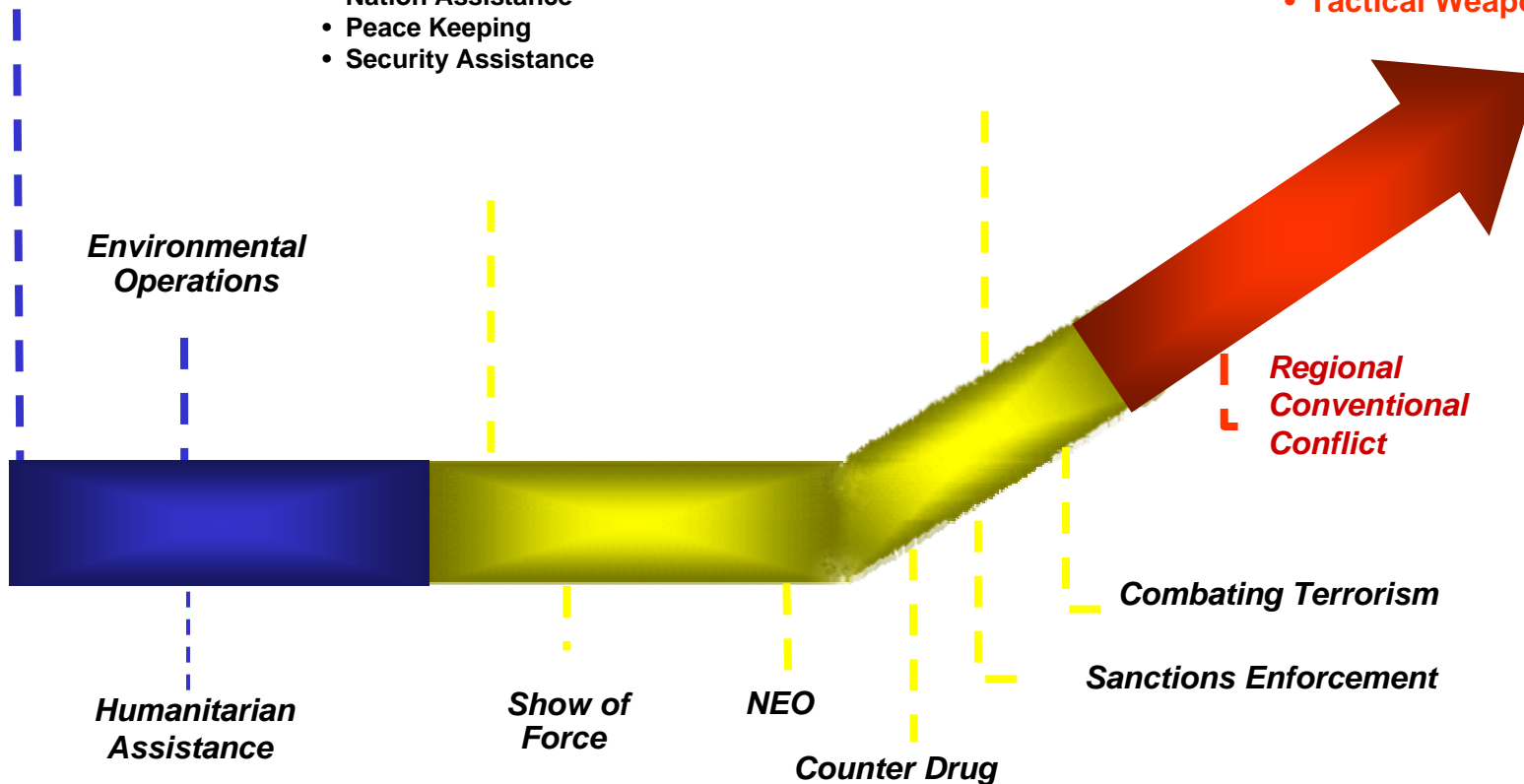
- Peace Building/Making
- Military to Military Contacts
- Arms Control
- Nation Assistance
- Peace Keeping
- Security Assistance

Limited Conflict

- Raids
- Strikes
- Insurgency & Counterinsurgency

Nuclear War

- Strategic Weapons
- Tactical Weapons



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Aim of Soldier Modernisation:

to enhance the

effectiveness

and

protection

of the dismounted

Soldier

and the group to which he or she belongs





Area of Responsibility:

- System aspects and all equipment of dismounted combatants
- Simulators and simulation techniques related to training of the dismounted infantry

Mission:

- Exchange of information among national soldier system programs
- Collaborative developments between nations
- Standardisation to benefit coalition operations





Any soldier system will be a compromise between the five capability areas

- **C4I**
- **Lethality**
- **Mobility**
- **Survivability**
- **Sustainability**

and must have a relation with

- **Education**
- **Training**



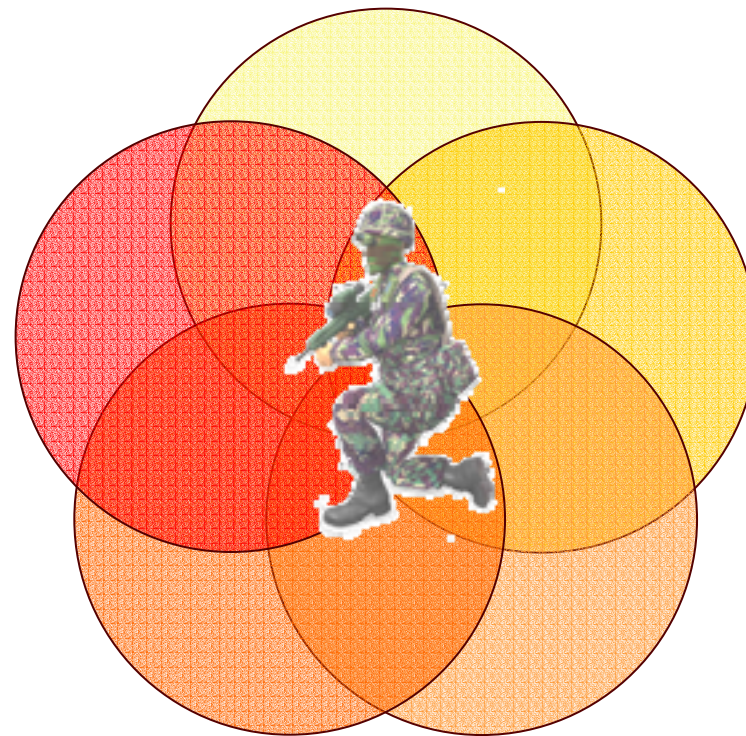
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Sustainability


C4I

Mobility 




Lethality

Survivability 

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Define international requirements



■ National Roles

- War fighting, Peace-keeping/support, Defence

■ MoD Being in Control

- Tailored solution
- Freedom of equipment choice

■ Legacy

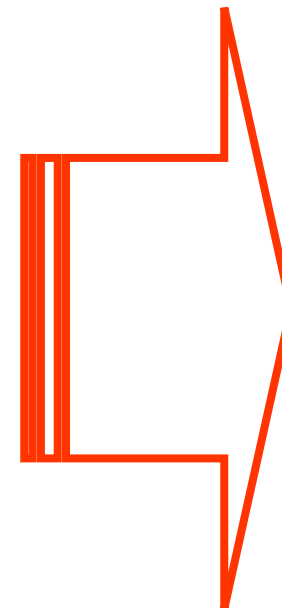
- Soldier equipments and interfaces

■ Change

- Doctrine
- Technology

■ Global Responsibilities

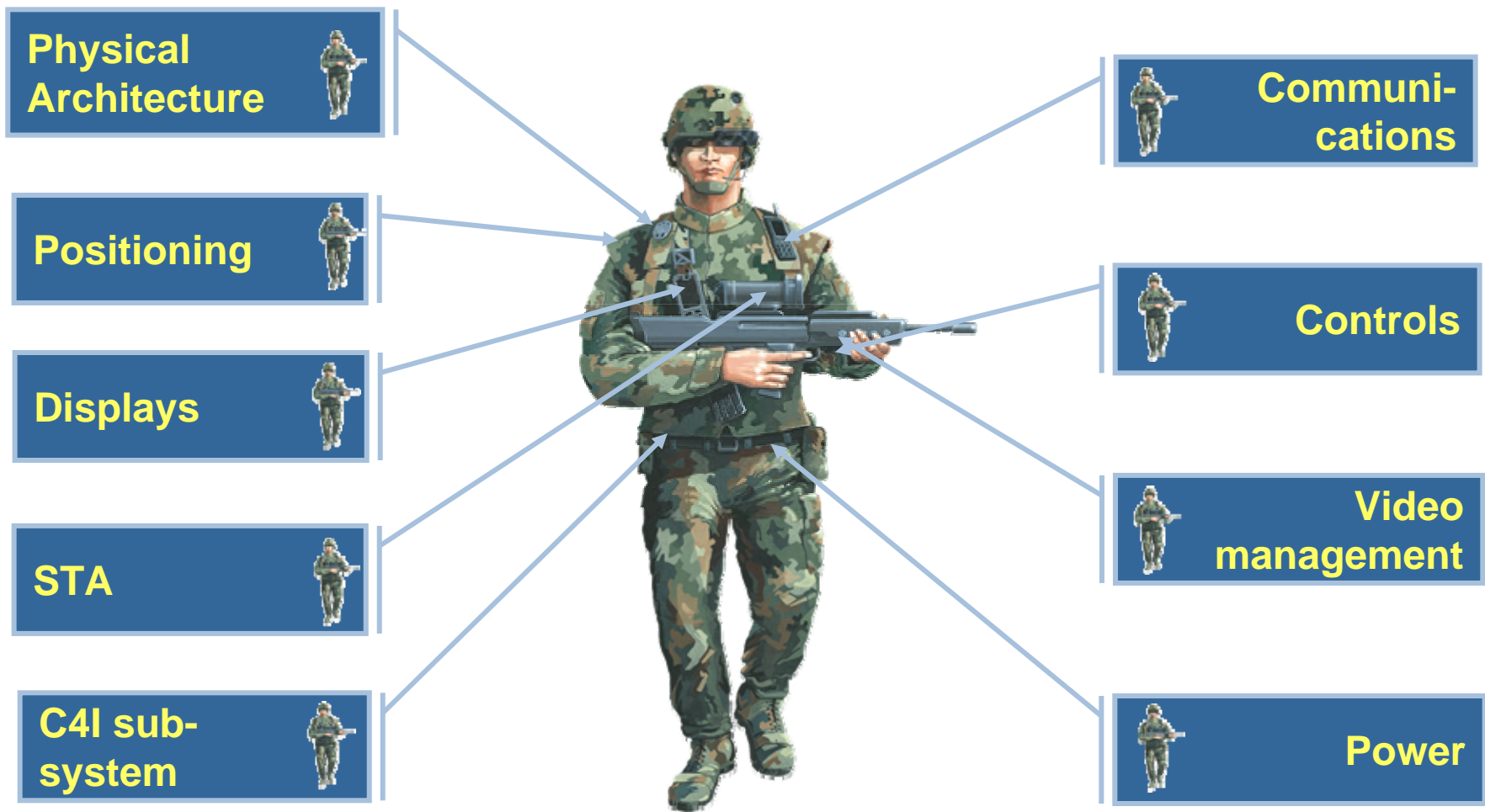
- NATO
- Communications and security



- Build on Lessons learned
- Enable evolution
- MoD in Control
- Enable interoperability

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Sensors for a Soldier System



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- **Wireless Soldier**
- **Smart uniform**
- **Weapons**
- **Integrated Head Protection**
- **NBC protection**
- **Power**

*Nanotechnology
innovation opportunities for tomorrow's defence
Frank Simonis & Steven Schilthuizen*

It is an international acknowledgment the dismounted soldier is and will be a **key player** on the transparent battlefield.



Key words in coming to any national soldier system are:

- Interoperability
- Standardisation
- Modularity
- Flexibility and adaptability
- Weight
- Lessons noted and learned
- Using reliable and technology high qualified solutions



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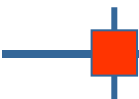
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- **High magnification weapon sights**
- **Improvements in under slung grenade launchers**
- **Red dot sights**
- **Sensor shooter links**
- **Co-operative targeting**
- **Thermal**
- **Training**
- **Existing squad weapons adequate - more emphasis on marksmanship skills**

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- **Advanced Power management**
- **Role and mission optimisation**
- **Reliability**



- 
- **Improved situational awareness**
 - **Navigation cues and overlays**
 - **Image capture**
 - **Network flexibility**
 - **Data reliability**
 - **Security**
 - **Management, filtering and aggregation**





- **Weight**
- **Night Vision**
- **Movement**
- **Navigation aids**

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- **Trade personal protection with weight**
- **National priorities**
- **Reversionary capabilities**
- **Situational Awareness**

Surveillance Targeting and Acquisition



■ Weapon Sights

- VIPER. Uncooled thermal weapon-sight for superior detection and squad engagement
- Other



■ Target Locators

- Leica Vector
- *Sophie MF*



■ Torso Camera

- Day or LLTV



■ Red Dot Sights

■ Monie

- Monocular night vision goggle

■ Observation devices

- Lion, Sophie, Vipir S.



■ GPS

■ Civilian GPS

- Utilises latest UBLOX system
- Improved indoor performance

■ Military GPS

- FMS Case
- In NL CIM

■ Internal Navigation System

■ Part of Thales roadmap

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Wireless Keypad

- Design in a manner to be adaptable to different gun types
- Allows user operation of:
 - Short Range Radio
 - Long Range Radio
 - Torso Computer Functions

Torso Controller

- Duplicate set of controls to weapon controls
- Includes Spartan 3 axis DMC
- Low power



Torso Interface Adapter

- Allows the integration of two radios with the only 1 headset
- Internal Civil GPS with indoors performance
- Integral antenna for wireless PTT



Vest

- Based on the load carriage HF work undertaken on the FIST Programme
- Incorporates unique webbing and pocket attachment technology



■ Headset

- Bone conduction. Enables freedom of choice for ear protection or awareness.
- Alternatives can be utilised if preferred



■ Short Range Radio

- Marconi Selenia EPRR. Selected by FIST



■ Long Range Radio



■ Soldier viewer

- Small hand held display for viewing data in a discrete manner



■ Soldier MMI

- Hand held display with controls for computer menu selection



■ Commander

- Body wearable display for viewing maps & receiving / sending of orders.



■ Planning

- Touch screen 6.4" display for mission briefing / planning



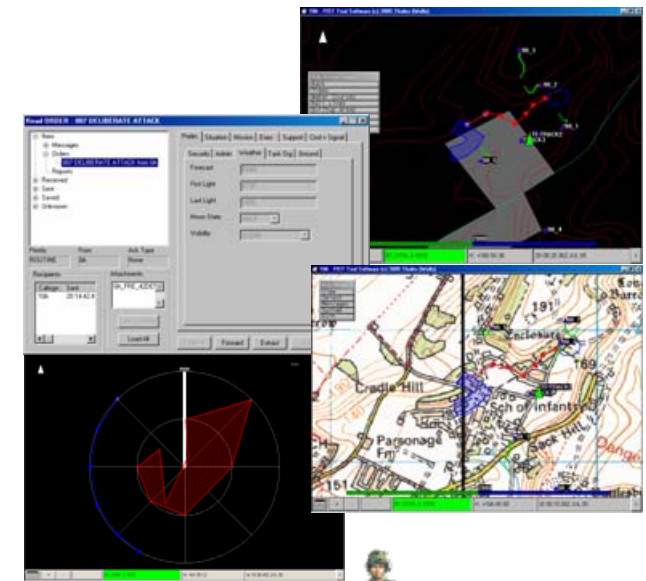
Computer

- Specifically designed for soldier modernisation



Software

- Specifically developed for Soldiers
- Selected for UK FIST
- Selected for NL CIM Soldier Digital Assistant



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Batteries

- Selected for the in-service IdZ Programme
- Proven to be durable in a soldiers environment
- 150 WHrs

Packaging

- Improved holster design allowing batteries to be placed “back to back”
- Replaceable with one hand operation



Management

- Includes SM Technology for monitoring usage cycles



Video Interface

- **Connection to:**
 - Torso sensor (camera on a stick),
 - Weapon sensors
 - Remote sensors
 - display via all displays illustrated.
- **Full video capability and frame capture.**
- **Video Frame Capture**
 - Via button on weapon Keypad or Torso Controller



THALES