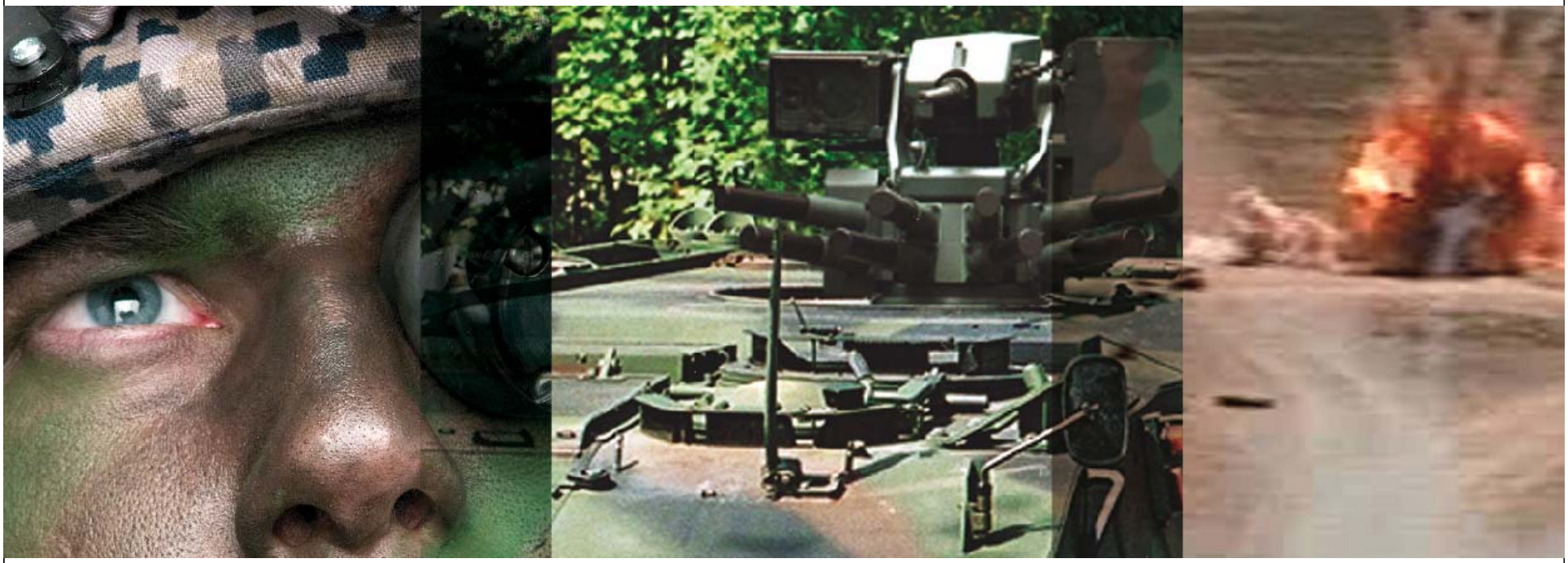
SAAB AVITRONICS

THREAT EVOLUTION and EW PRE-EMPTION



DATE 25-26 August 2009 AOC CONFERENCE

Johnny Chabalala CSIR

Agenda

- Introduction
- Threat evolution
  - Conventional threats
    - Trends
  - Asymmetrical threats
    - Trends
- Future threats
- Realities facing deployed personnel
- EW pre-emption
- Conclusion

Threat defined

- Threat

A suggestion that something unpleasant or violent will happen especially if a particular action or order is not followed

Threat (cont)

Counter

To react to something with an action or to defend yourself against something

Counterattack

An attack intended to stop or oppose an attack by an enemy

Symmetrical or Conventional Threat

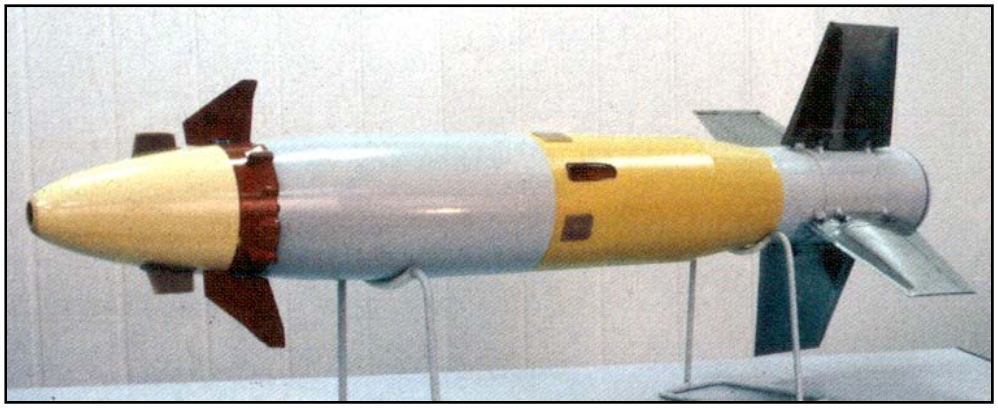
- Conventional threats are known
  - **Orbats**
    - Systems
    - Weaponry
    - Numbers
  - **Doctrine**
    - Training
    - Tactics

Trends/Developments in Symmetrical Environments

- Most of the traditional threats remain
- Main armament standardisation
- Main armament calibre is increasing in many parts of Africa
  - Tanks 115mm – 125 mm
- Side attack mines

Trends/Developments in Symmetrical Environments

- ATGM ranges are increasing
  - Land based vehicles, shoulder launched and tri pod
    - 2 500m, 5 000m to 8 000m
  - Helicopter launched
    - 10 000m
  - UAV delivered
    - 10 000m
- GLATGMs are proliferating in Africa
  - T-72B, T-64A, T-90S

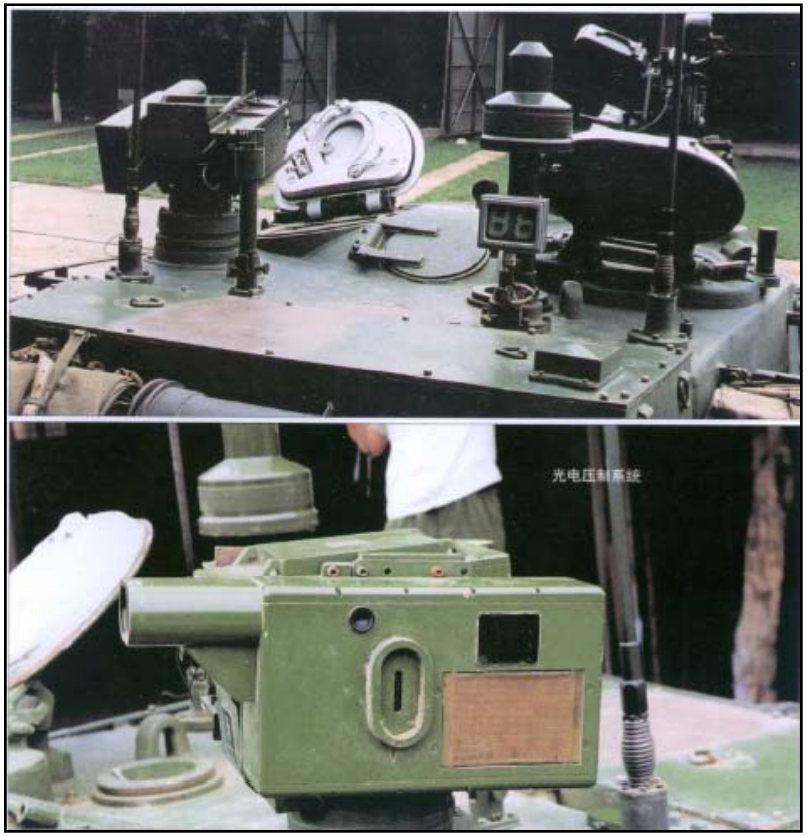


Trends/Developments in Symmetrical Environments

- IEDs
  - Detonation of one or more IEDs to initiate ambush
  - Use of weapons for purposes they were never designed for
    - RPG against hovering helicopters
    - Dug in artillery shells with anti-tank mines
- Use of Child soldiers

Trends/Developments in Symmetrical Environments (cont.)

- Use of laser weapons
  - Russian PAPV
  - Chinese Type
- Laser development may continue



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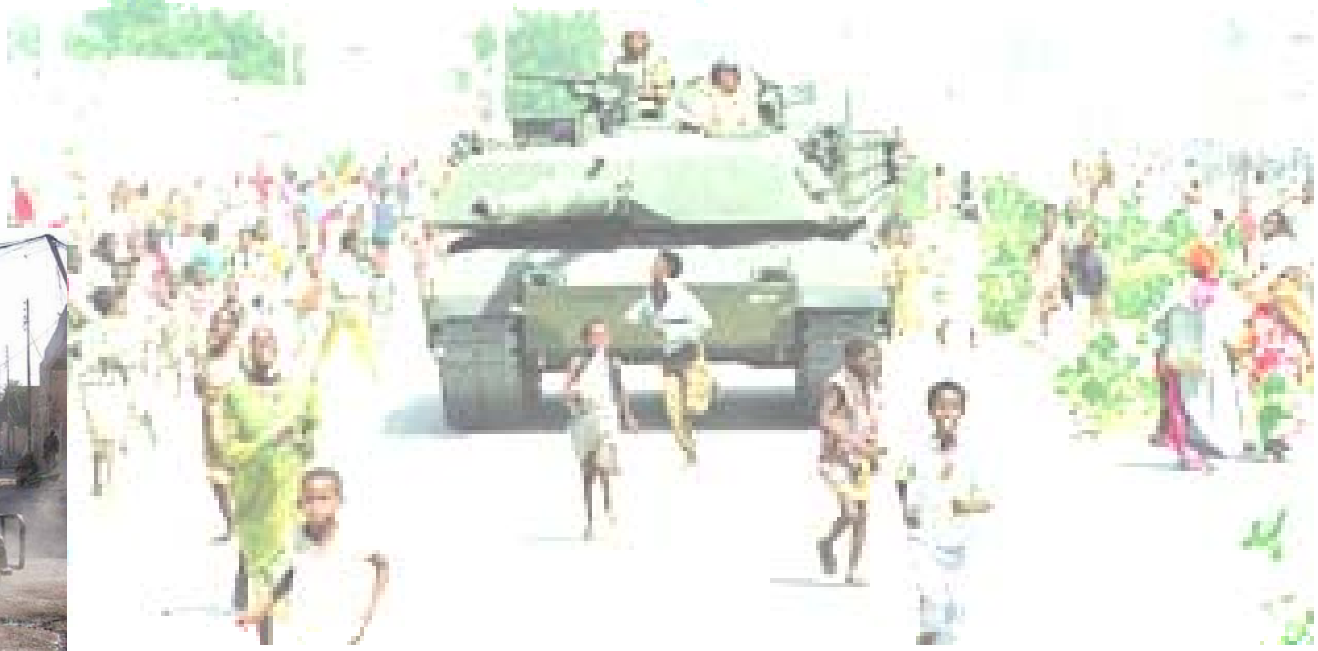
Asymmetrical threats

- Threat focus is on non-linear tactics
- Attacks are unpredictable
- Attackers are not easily visible
- Threat weapons are mostly easy to conceal and transport
- IEDs



Trends/developments

- Use of IEDs to force deployments
- Execute coordinated attacks
- Avoid decisive engagement
- Attack areas outside frontal protection arc
  - Attacks from rear, side and top of vehicle
- Engage at short ranges
- Use electronics to detonate IEDs
- Use of child soldiers
- Petrol bomb attacks

Future threats

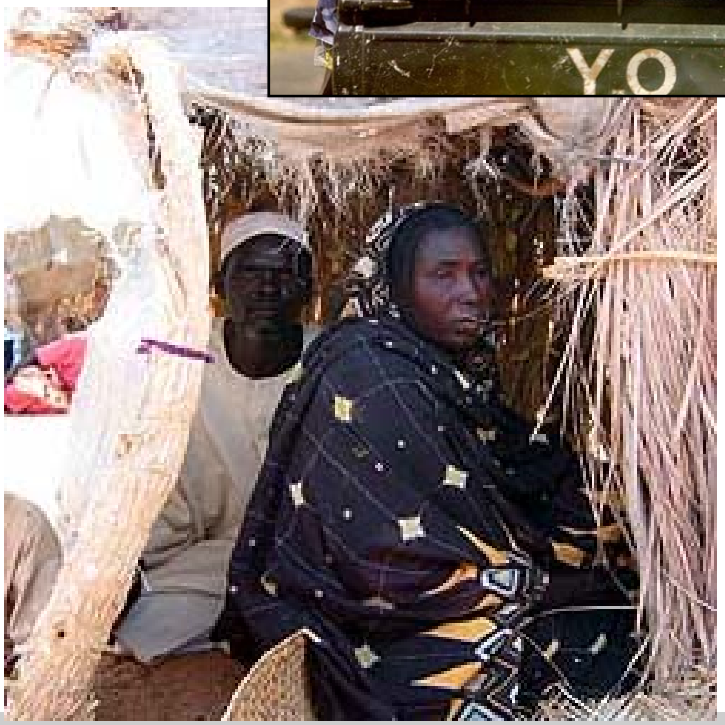
- Electronic Warfare Systems
- Smart munitions
- Cyber warfare
- Laser threats
- HPM
- EMP Weapons

Realities facing soldiers now and in future

- Conventional systems in peacekeeping
  - MBTs
  - Protection for urban terrain
- Limited capability
  - AT capability
- Superior weapons in rebel hands
- ATGMs in rebel hands

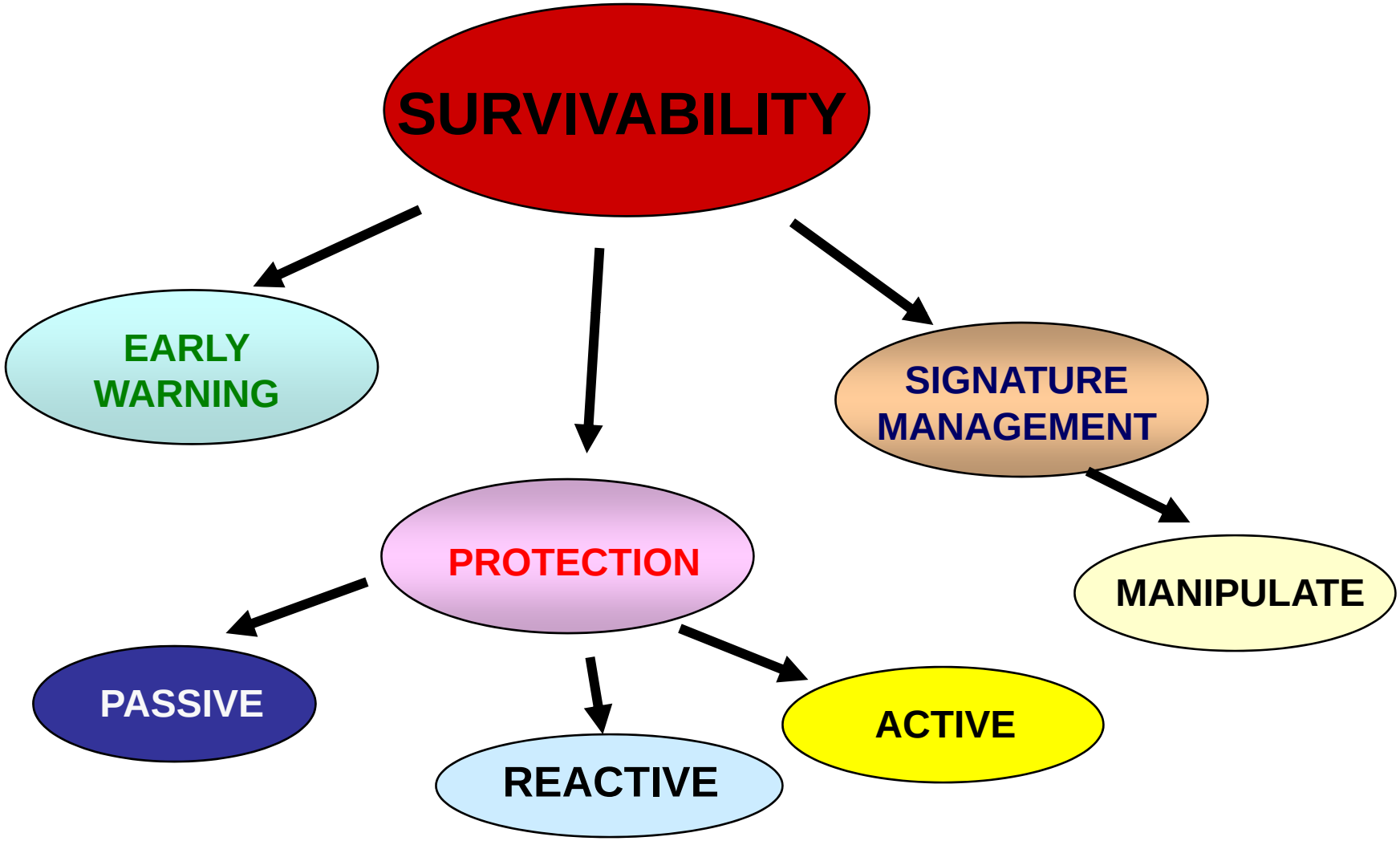
Realities facing soldiers now and in future

- Increase of warring fractions in civil war/strife
- Mutilations in civil strive/war
- Internal displacements



EW pre-emption

Effective Survivability and Defeat of Threat = Interaction of Technologies



EW pre-emption

EW pre-emption

- Use of electronic systems is inevitable for effective pre-emption on today's battlefield
  - Radars
  - Sensors
  - Surveillance systems
  - Air dropped wireless vidcams
- Advantages
  - Early warning
  - Intelligence consolidation (HUMINT, ELINT)
  - Electronic intelligence dissemination
  - Quick and well thought decisions can be made
  - Swift and quick allocation of resources
  - Rotation planning (equipment and/or personnel)
  - Planning for hand to hand combat and humanitarian aid simultaneously

EW pre-emption

- Technology, electronics and tactics needs synchronization
  - HMI
  - Doctrine adaptation
  - Force structure
  - COIN assisted by EW systems

- Symmetrical and asymmetrical conflicts will need a combination of conventional and non-conventional preparedness by deployed personnel

- Systems should be capable of defeating old and new generation threats

EW

- EW systems does not only electronically and automatically defeat the threat but also give an indication of adversary position thus improving forces position

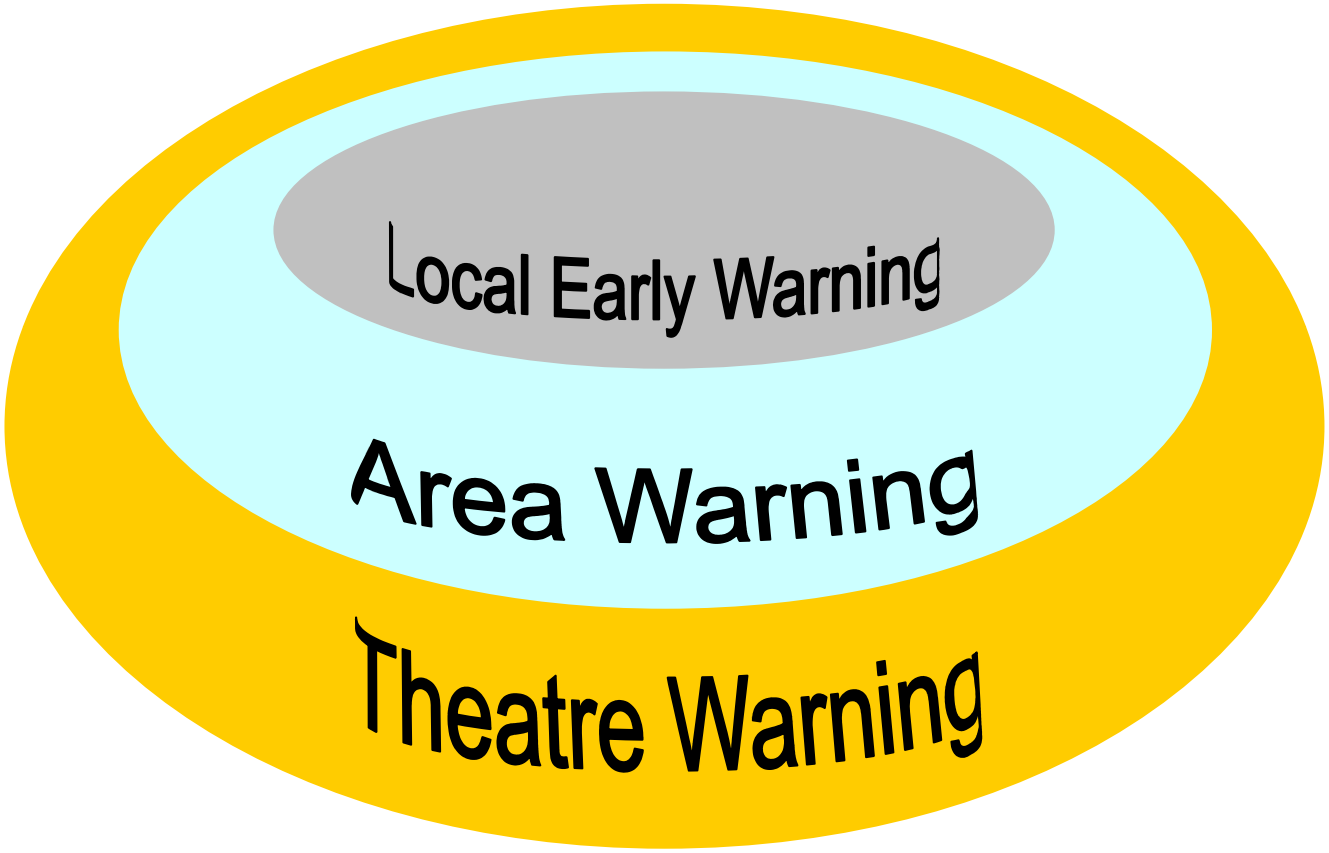
- Electronic systems such as ground based surveillance provides area scanning capability thus providing information on a continuous basis
  - Cost
  - Numbers

- Armed forces are in a position to get closer to enemy when they have DAS compared to not having DAS.

EW pre-emption

- Current and future threats require armed forces to employ state of the art technologies
  - Requires flexibility, high mobility and quick reaction by armed forces
    - Insurgents will determine the direction of the conflict
    - Insurgents will plan coordinated attacks in different locations
    - Degrade battle systems
    - Destroy high value assets
    - Distabilise Commanders core function
- This may require
  - Clear intelligence picture
  - Reliable intelligence about threats
  - Unplanned rotations by armed forces
    - Personnel and equipment
  - Adaptation of plans
  - Reconfigurable systems
  - Increased protection of convoys
  - Continuous change of routine
  - Quick data transmission

Operational Warning and Protection



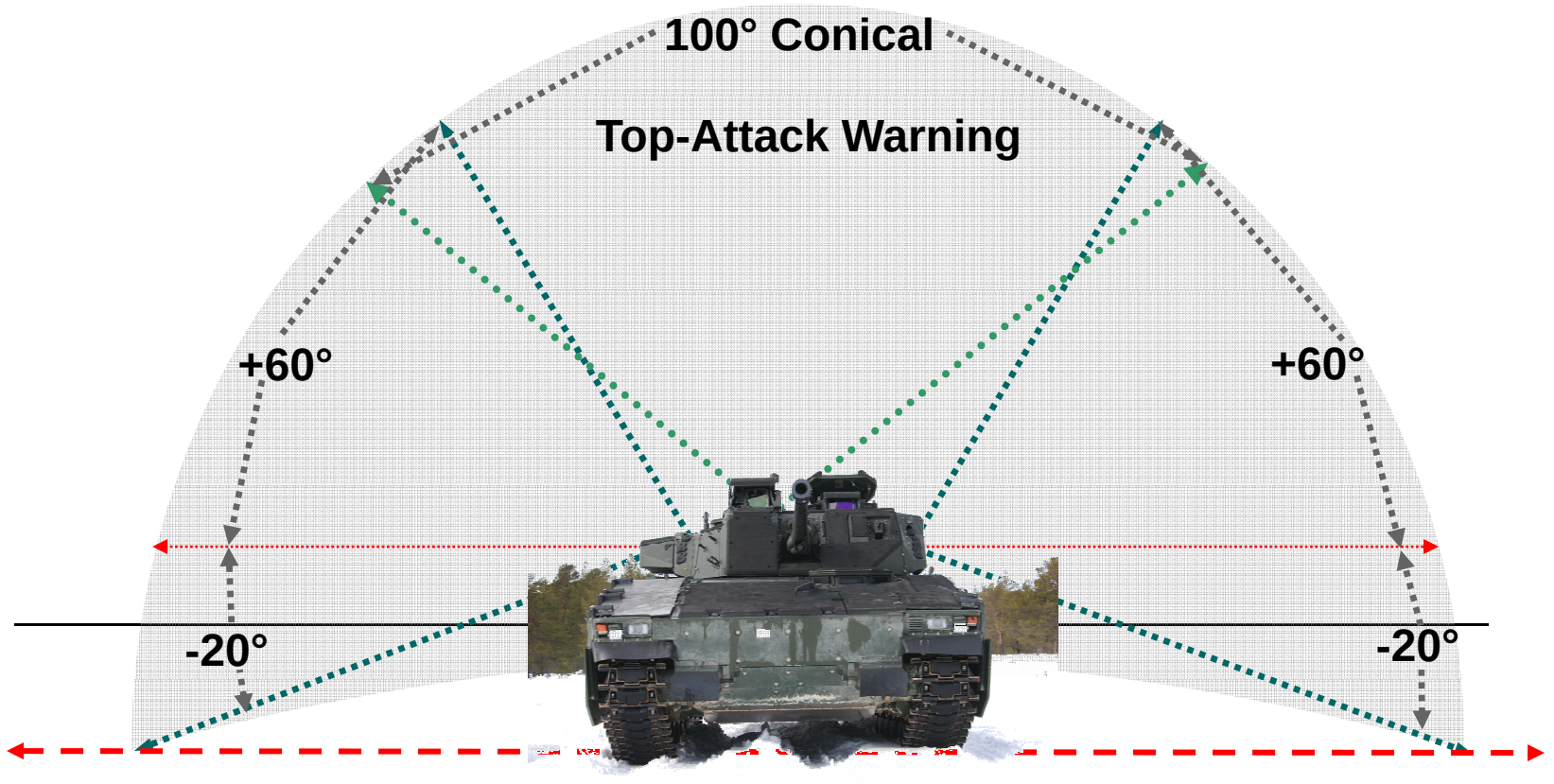
Point defence

- Defence against
  - Contact (vision and fire)
  - Small arms
  - rockets
  - CE munitions
  - KE munitions
  - Missiles
  - IEDs
  - Mines
- Passive armour
- Reactive armour
- Active protection

Recent Survivability Lessons

- Passive, reactive and bar armour are not able to provide adequate all-round protection in modern conventional warfare, urban terrain and asymmetrical warfare:
  - advanced/ new generation ammunition
  - very short range engagement < 25 m
  - attack from sides, rear and top
  - coordinated rounds at same vehicle
  - vehicle weight restriction limits conventional protection options.
- Hemispherical protection is needed.
- Collateral effects must be controllable.
- Fast screening smoke has value in ambush situation (not phosphorous smoke).
- Petrol bomb protection is required.
- Sharing threat data over a network enhances response options.

Protection Requirement



APS Baselines And Growth Path

LEDS 50
Laser Warning Sensors


Primary Sensor


Primary Sensor


Primary Sensor


Primary Sensor


Anti-Reflection & Top Attack Sensor


Active Defense Controller

LEDS 100
Rapid Screening / Softkill

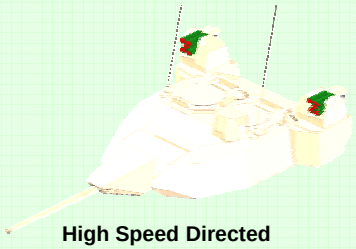

High Speed Directed Launcher


IR Jammer


Extra Displays


Wind Sensor

LEDS 150
RPG / ATGM Defeat


High Speed Directed Launcher installed

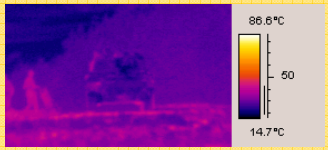

MCTS-150

Mongoose-1

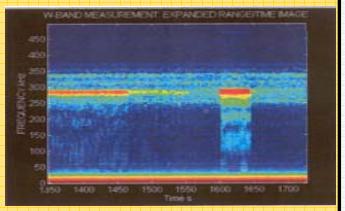
Hardkill

LEDS 200
Multi-band Seeker Defeat


Threat Acquisition And Tracking System (MCTS-300)



Active Signature Management



LEDS 300
KE & Stand-off Attack Defeat


Long Stand-off Hardkill

DAS Effects on Modern Ammunition

- DAS technology is continuously 9mproving to counter munition technology developments
  - CE ammunition
  - KE ammunition
    - Speed
    - Penetration
    - Flight profile (ATGMs)
  - Smart munitions
  - IEDs

Automated Wheel Coverage

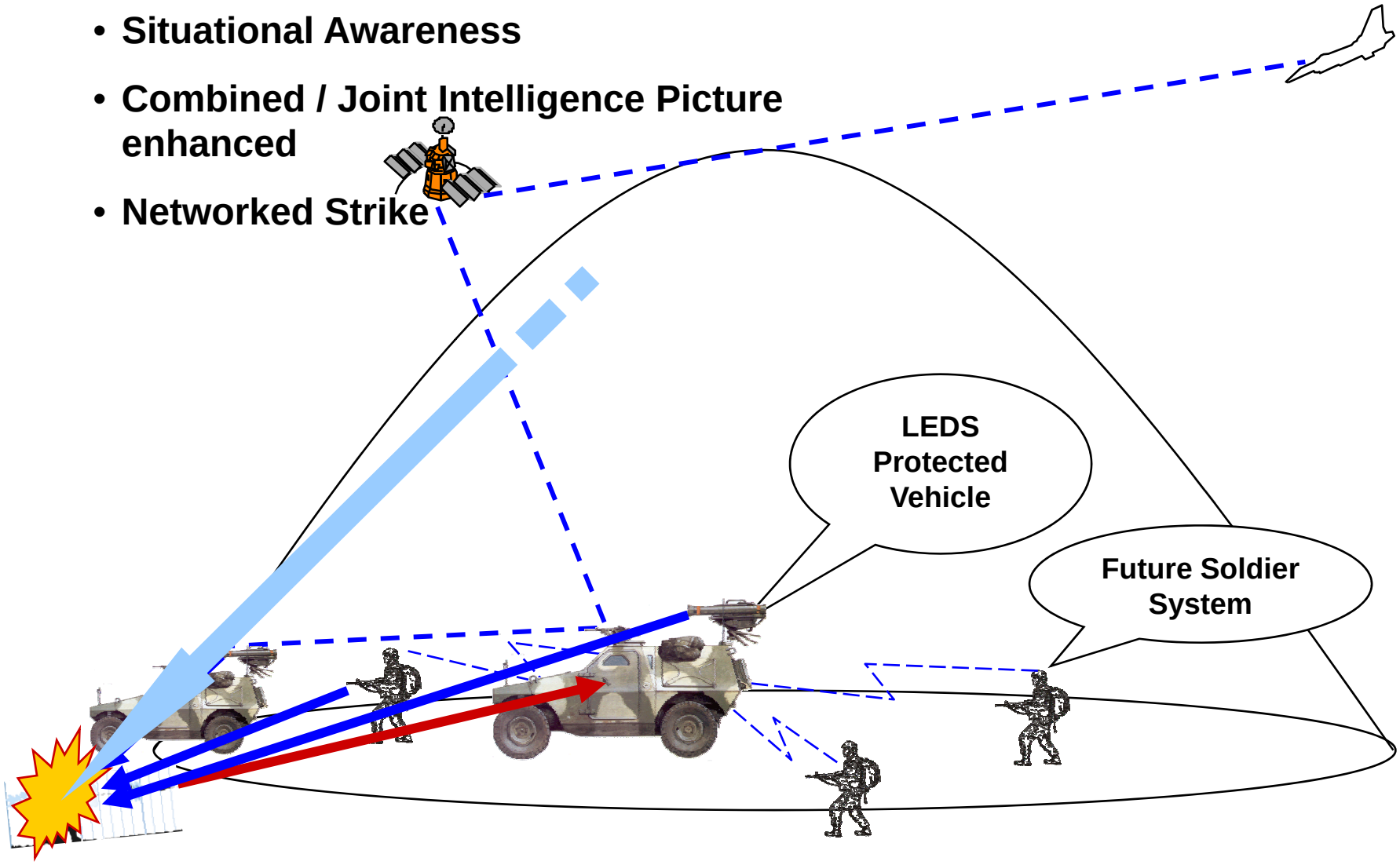
External Fire Suppression & IR Signature Reduction

EW Solutions

- Early Warning
- Automatic threat analysis
- Active signature management
- Automatic fire suppression
- Automated threat defeat
- Threat data storage
- Active protection systems/Defensive Aide Suites

DAS via BMS = Networked Value Added

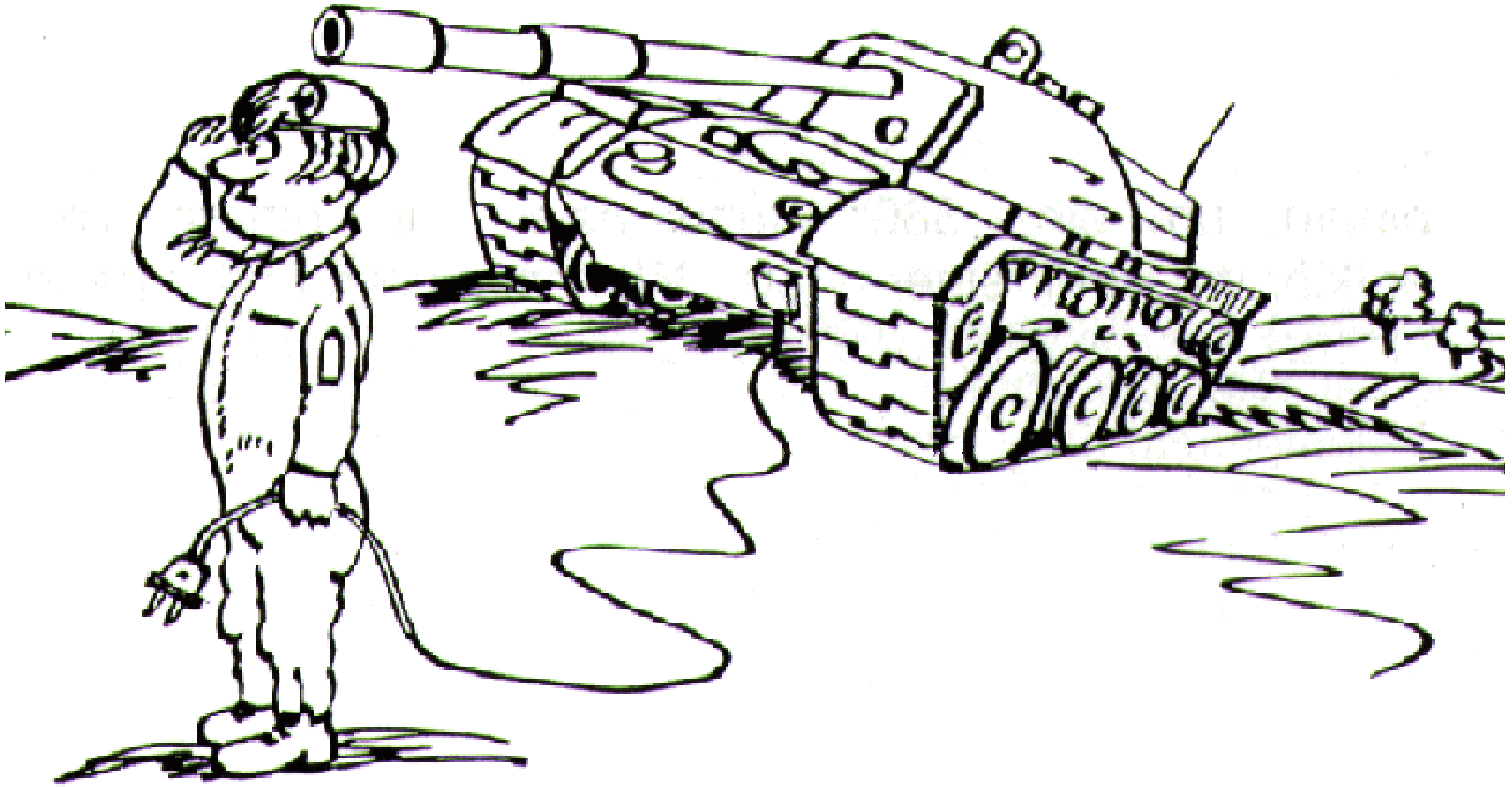
- **Situational Awareness**
- **Combined / Joint Intelligence Picture enhanced**
- **Networked Strike**



Conclusion

- New generation weapons will remain a threat in both symmetrical and asymmetrical conflicts.
- Due to globalization and movement of personnel, weapons control may remain a problem if no practical plans are realised and implemented.
- Armed forces will not rely solely on tactics to be able to defeat future threats.
- The asymmetrical battlefield will require agility and well thought requirements and configuration for success to be realised.
- Increased fire power without protection and early warning will not defeat future threats.
- EW may have to be applied to other assets over and above combat vehicles
- Conventional warfare may re-surface

DON'T FORGET THE LOGISTICS!



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