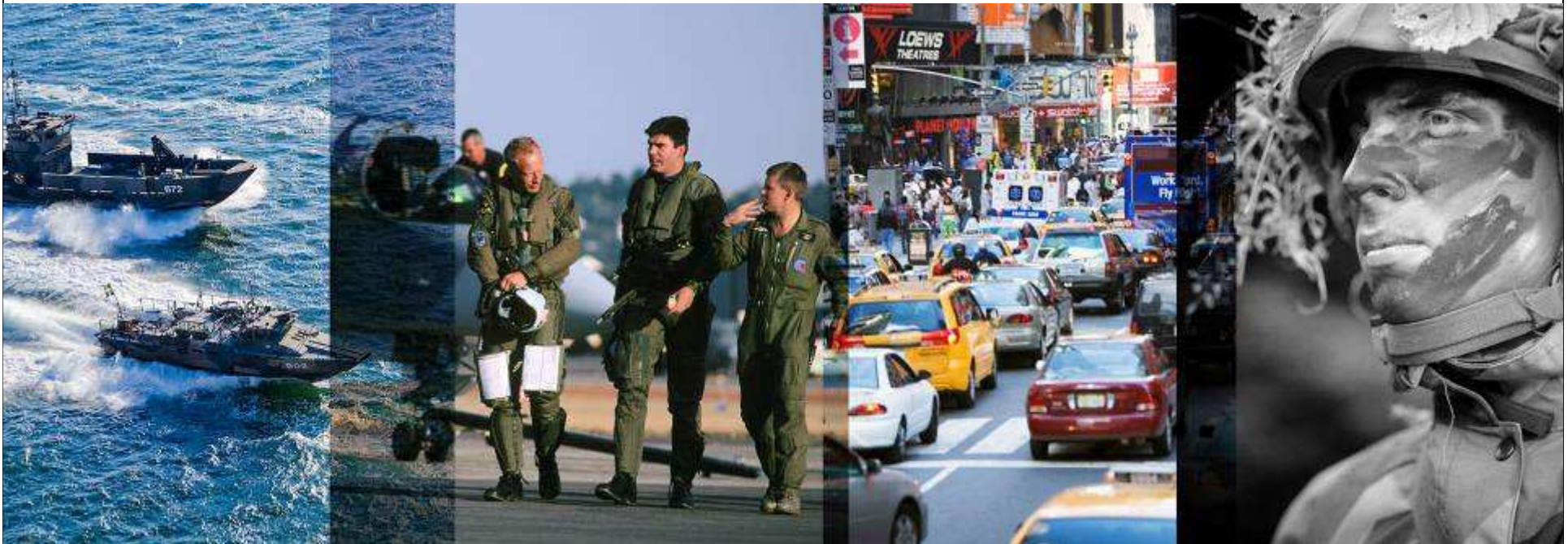




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# GRIPEN DEMONSTRATOR PROGRAMME



**NAME** Magnus Olsson, Marketing Director

**DATE** April 23, 2008

# GRIPEN DEMO

## ▶ DEVELOPMENT PROGRAM DESIGNED TO

- Demonstrate a/c development potential
- Demonstrate industrial capabilities
- Evaluate new technologies
- Encourage innovation
- Motivate
- Stimulate Gripen marketing

...and create a foundation for the production of the next generation Gripen



# GRIPEN DEMO

## ▶ FULLY FUNDED BY

- Industry (risk sharing partners from all over the world)
- FMV (Swedish Defense Material Administration)
- Potential future Gripen N/G customers



# TECHNOLOGY AREAS CONSIDERED

## HMI

- Advanced NV/HMD
- HMI enhancements
  - Display & Control Optimization
  - "Smart" Start-up
  - Advanced Decision Support
- Direct Voice Input
- 3D Audio

## Structure

- Increased internal fuel by 40%
- Increased external fuel by 33%
- Addition of 2-3 stores
- Robust Main Landing Gear
- Increased MTOW 16 ton
- Supersonic ejection of drop tanks
- ...

## IRST

- Sensor Fusion
- ...

## Radar

- AESA
- ...

## Enhanced EW-suite

- Missile Warner
- RWR & Internal Jammer
- Passive ESM
- Laser Warner

## Comms

- Satellite comms
- Enhanced link for CAS
- Link 16 advanced functions
- Real Time Image Transfer

## New Engine

- Increased Thrust



## Enhanced Avionic Structure & Capabilities

- New Computer and Data Bus system
- Enhanced focus on software safety and criticality
- Increased capacity and performance
- More efficient functional development
- New and enhanced functions
  - Advanced Embedded Training
  - Advanced Multi Sensor Integration
  - GCAS
  - ACAS
  - Precision Navigation
  - Terrain avoidance

## Weapons & External Stores

- Increased stores capability (Pylons, Max TO Mass)
- Precision Munitions (GPS bombs etc.)
- Advanced integration of IRIS-T, METEOR etc
- KEPD 350 or similar
- Towed Decoys
- Advanced Pods (FLIR/LDP, Recce, Jammer) etc



# GRIPEN N/G THE AIRCRAFT

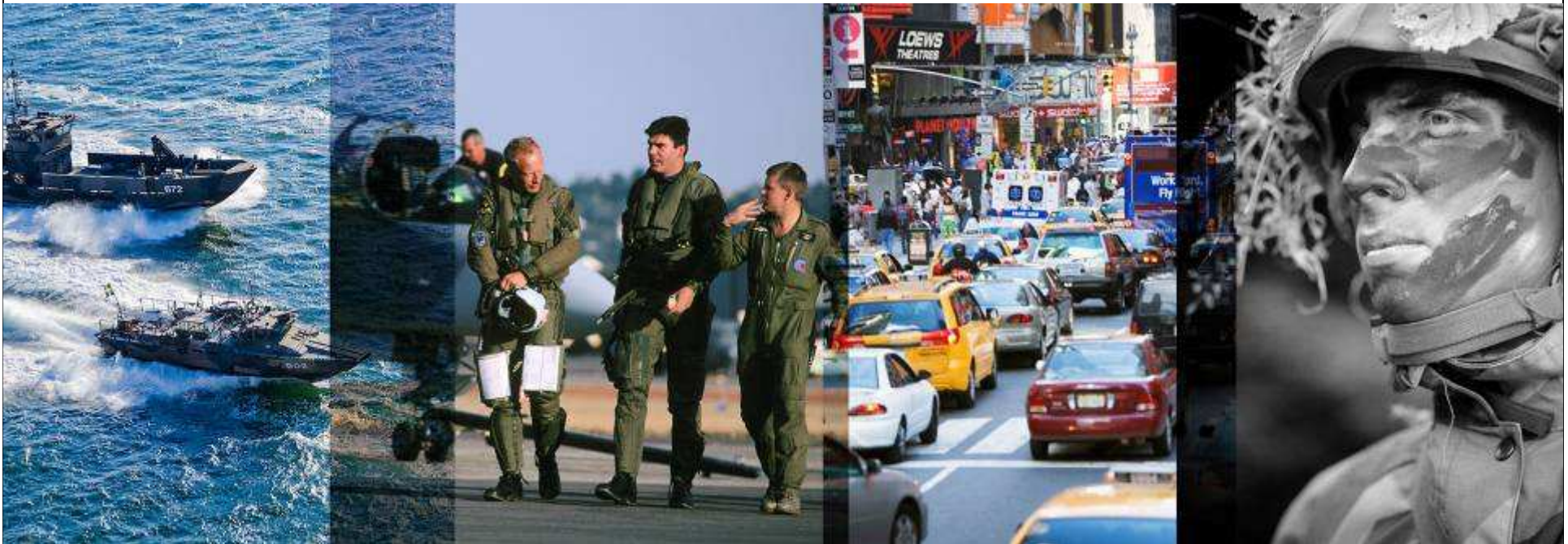


Number of Stations	10
Empty weight	7.1 ton
Basic flight design weight	9.1 ton
MTOW	16 ton
Internal fuel	3.3 ton
External fuel	3.8 ton
Payload	>6 ton





# AESA RADAR FOR GRIPEN DEMO



**NAME** Peter Andersson

**DATE** April 23, 2008

**TITLE** Gripen AESA Radar Demonstrator



# THE ADVANTAGES OF AESA TECHNOLOGY

## AESA ATTRIBUTES

- ▶ Beam agility
- ▶ Adaptive beam formation
- ▶ Higher frequency bandwidth

## GIVES THE RADAR

- ▶ Greater flexibility and time efficiency
- ▶ Increased ability to handle simultaneous tasks
- ▶ Improved performance

## TACTICAL ADVANTAGES

- ▶ Increased situation awareness
- ▶ Enhanced fire control
- ▶ Reduced risk of interception
- ▶ Reduced life cycle cost



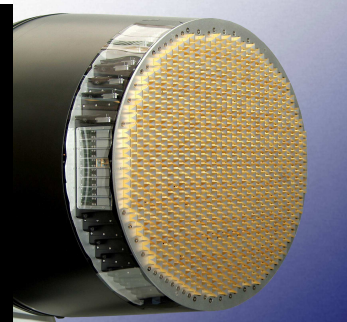
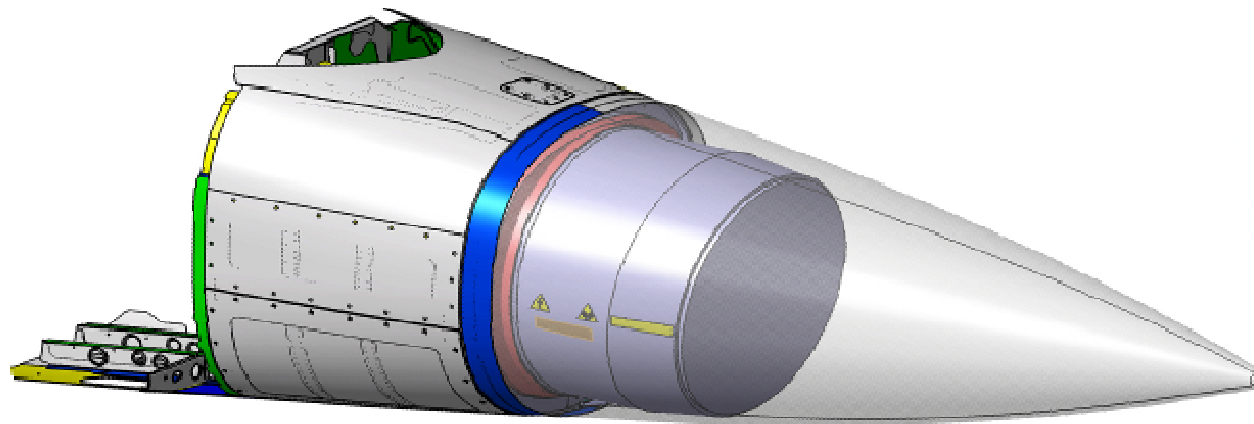


# FUNCTIONALITIES USING THE AESA FEATURES



- Improved target tracking
- Mode flexibility
- Low probability of intercept
- Increased detection range
- Improved resistance against electronic warfare
- Increased operational availability

# AESA RADAR IN GRIPEN DEMONSTRATOR



# AESA RADAR DEVELOPMENT IN COOPERATION

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- Radar system and its capabilities
- The integration in the aircraft

## THALES

- The antenna
- Best radar technology in a cost effective way



# AESA FUNCTIONALITIES INCORPORATED IN THE GRIPEN DEMO



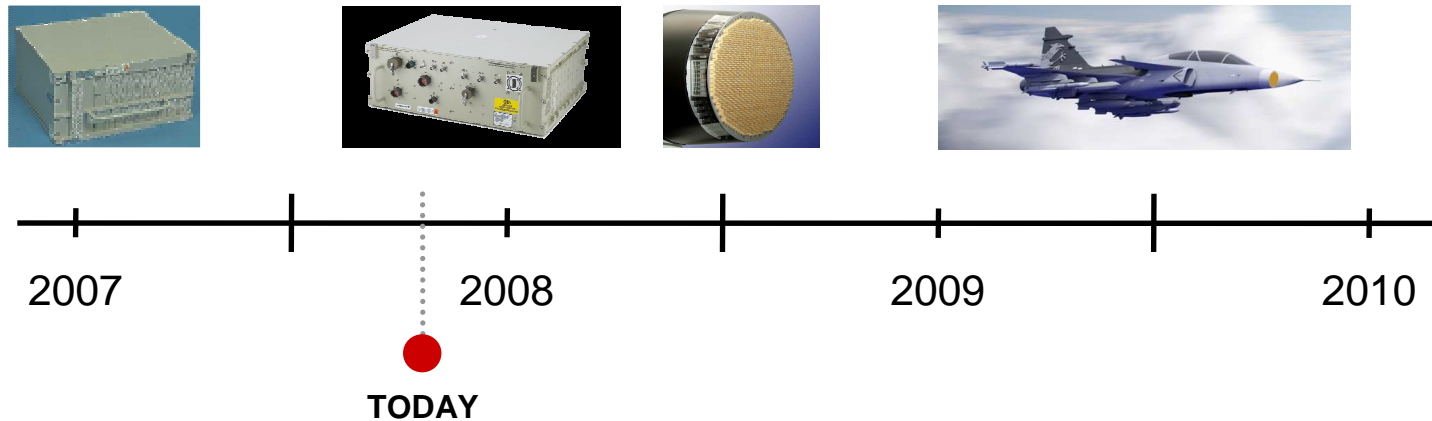
**The demonstrator incorporates functions including:**

- Improved target tracking
- Mode flexibility
- Increased detection range
- Lower probability of intercept
- Increased operational availability

- Improved Target Tracking
- Mode flexibility
- Low probability of intercept
- Increased detection range
- Improved resistance against electronic warfare
- Increased operational availability



# TIME SCHEDULE FOR THE AESA-RADAR DEMONSTRATOR



- ▶ Development of subsystems
  - ▶ Integration of subsystems
    - ▶ Aircraft integration
      - ▶ Demonstrations

# CO-OPERATIONAL DEVELOPMENT OF AESA RADAR

## Conclusions

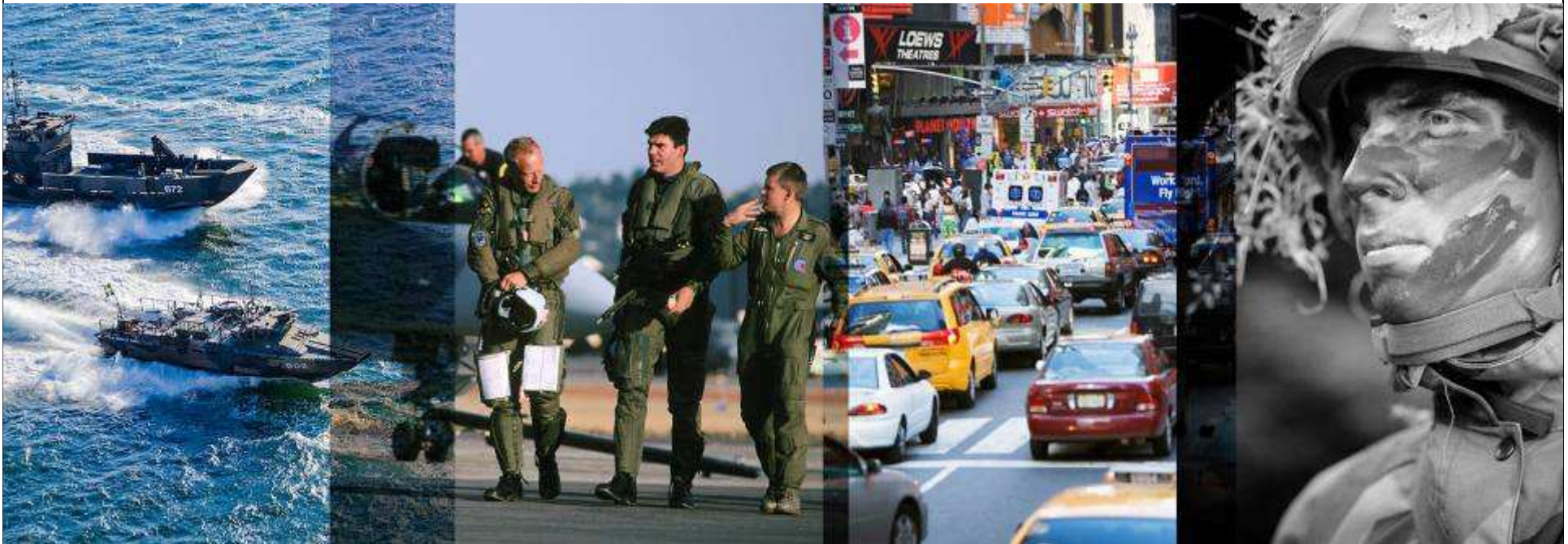
- ▶ On-going development of the most advanced technology for the radar
- ▶ Development in co-operation between Saab and Thales
- ▶ AESA demonstrations will commence autumn 2009





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# GRIPEN DEMO AND GRIPEN NG AVIONICS AND ELECTRONIC WARFARE



**NAME** Ben Ash, Executive Vice President Marketing, Saab Avionics

**DATE** April 23 2008

# NEW AVIONICS ARCHITECTURE

- ▶ The new avionics architecture will deliver shorter lead times, lower costs and more functionality.

## PRIMARY ASPECTS:

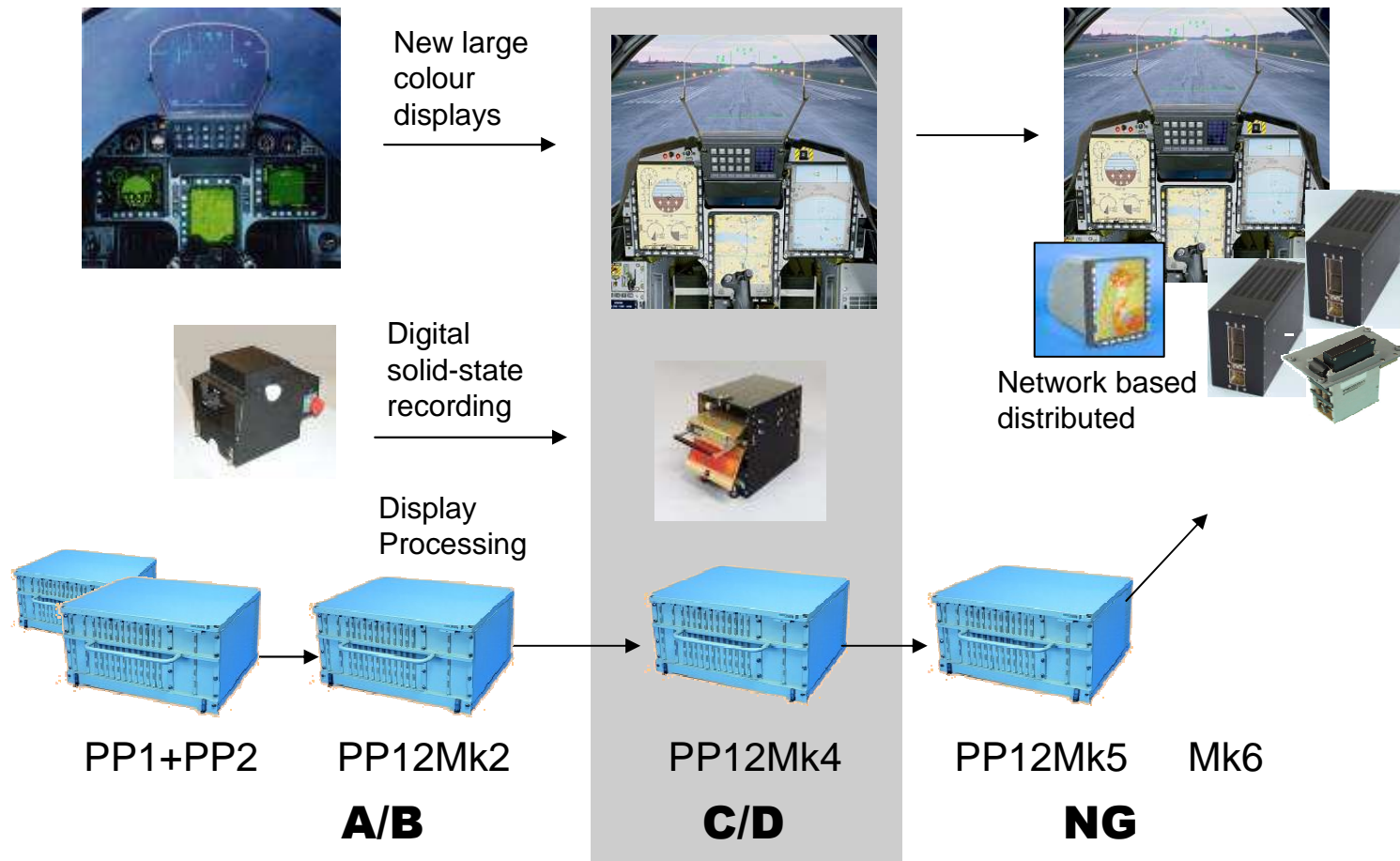
- ▶ Full ISTAR (Intelligence, Surveillance, Target, Acquisition, Reconnaissance) capability in processing, displaying and recording sensor information.
- ▶ Avionics with high speed data and image network communication supporting flexibility and growth.
- ▶ Improved and flexible network based mission recording.
- ▶ Improved systems computation capability using flight management and mission computers with criticality segregation.



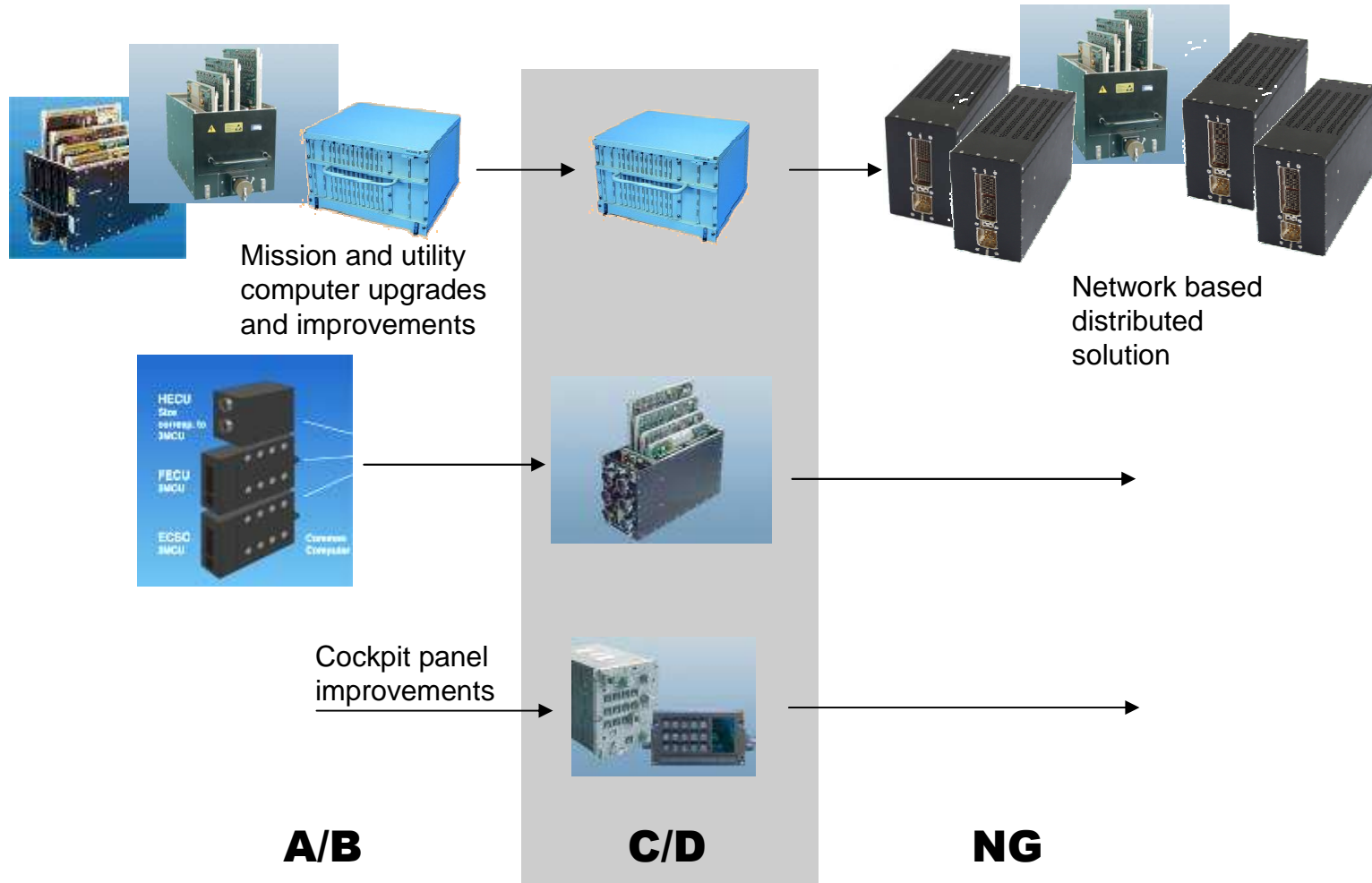
# NEW AVIONICS ARCHITECTURE

- ▶ Improved management and handling of criticality levels will support
  - improved system safety and survivability
  - shorter lead time and cost reduction specifically for introducing of new mission function.
- ▶ More efficient development process using high level tools and model based engineering will also give benefits to shorter lead times and lower price in function development (adding new functions) and verification

# CONTINUOUS SUPPORT WITH SYSTEM IMPROVEMENTS



# CONTINUOUS SUPPORT WITH SYSTEM IMPROVEMENTS



# ELECTRONIC WARFARE: GRIPEN'S SECRET SUPREMACY

- ▶ Gripen's suite of EW and self-protection systems is one of the most advanced in service.
- ▶ New elements of the EWS suite for Gripen NG that will be tested and developed on the Gripen demo aircraft includes Saab's Missile Approach Warning System (MAW).
- ▶ Gripen's future EW system will incorporate enhanced self-protection jammer with digital threat receivers, further improvements of the Digital Radio Frequency Memory (DRFM) for highly sophisticated jamming techniques.
- ▶ Other options include towed decoys and pods for dedicated electronic attack missions.

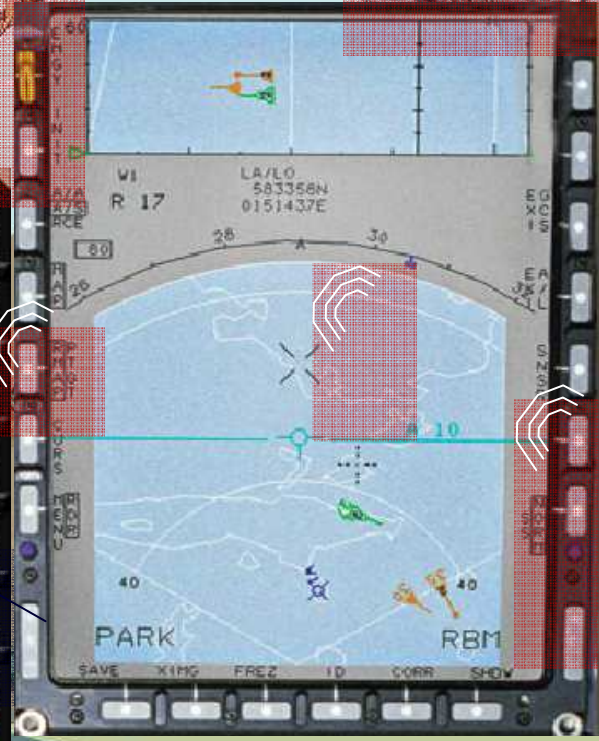
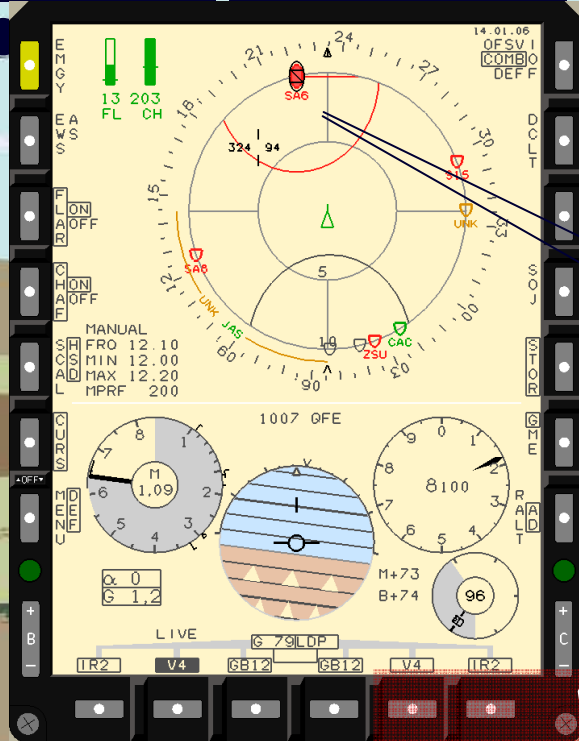


# EXCELLENT PILOT SITUATION AWARENESS

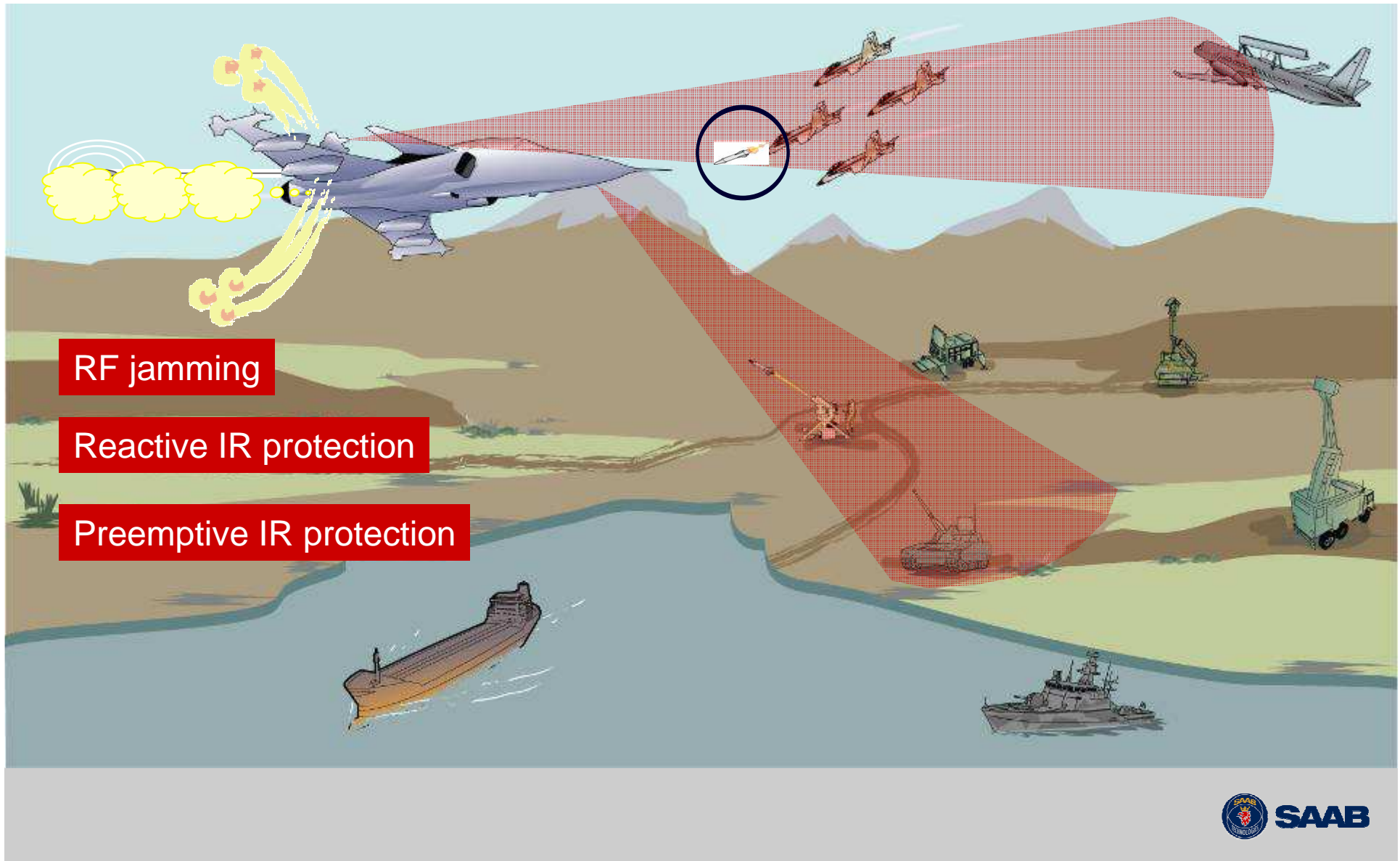
RF sensors

MAW sensors

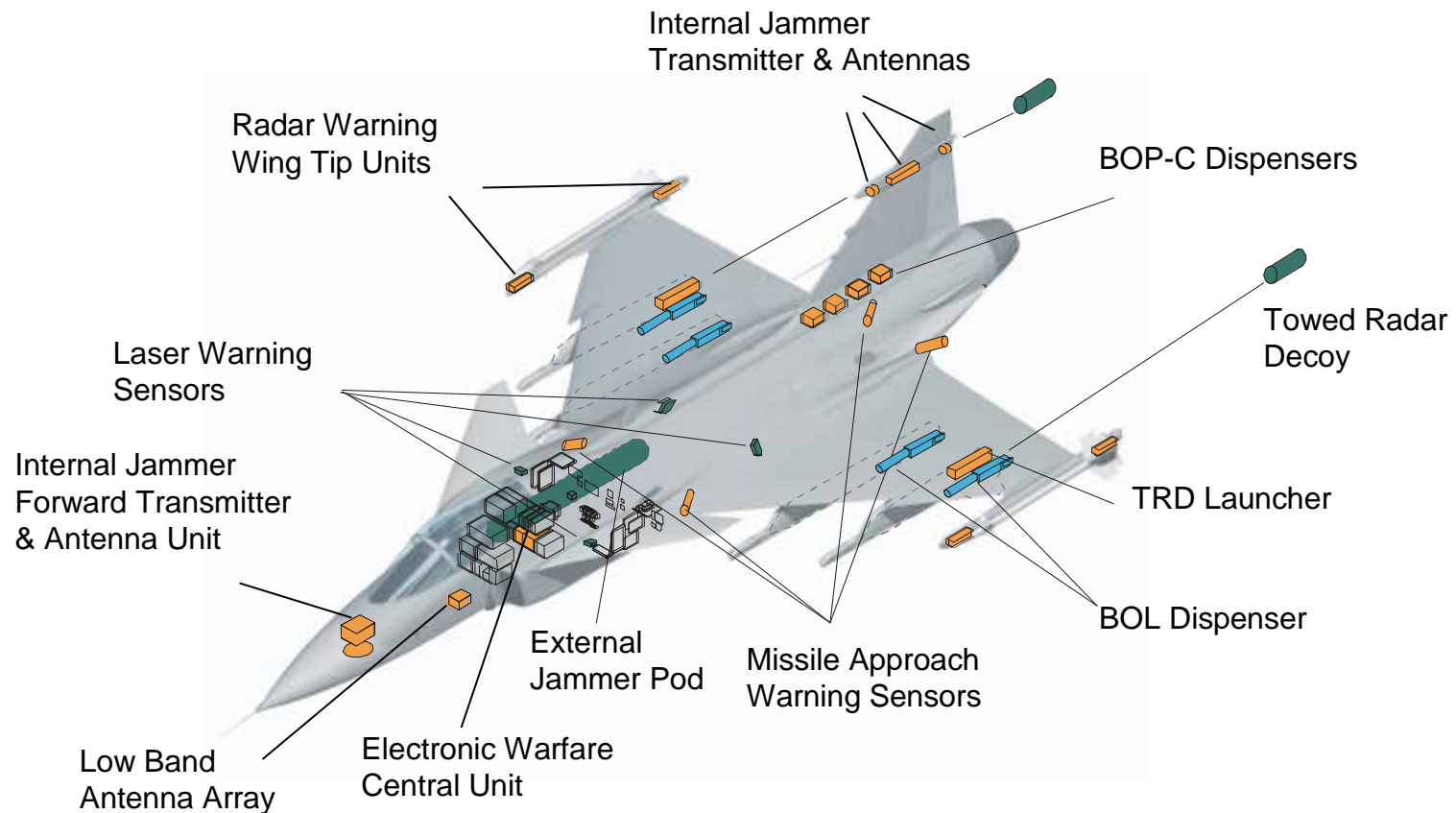
LWS sensors



# EWS 39 NG SELF PROTECTION



# GRIPEN NG ELECTRONIC WARFARE SYSTEM



# GRIPEN NG – EW SYSTEM

## ESM / RADAR WARNING SYSTEM

- ▶ A state of the art Digital Receiver and additional interferometer antennas in combination with current wide open IFM receiver system yield
  - excellent sensitivity and selectivity without sacrificing probability of intercept
  - precision direction finding and passive ranging
  - elevation measurement capability
- ▶ Increased frequency coverage
- ▶ Today's well proven signal processing further improved and adapted to the enhanced receiver resources
- ▶ Improved recording capability gives the ESM / RWR System additional ELINT characteristics

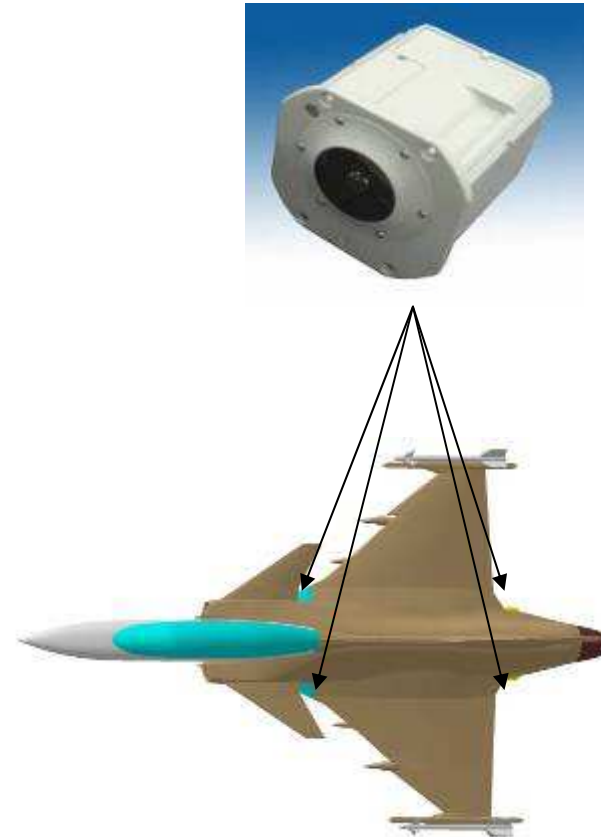
# GRIPEN NG – EW SYSTEM SELF PROTECTION SYSTEM

- Enhanced DRFM - generation 2
- Improved multi threat capability and jamming bandwidth
- Towed Radar Decoy (TRD)
- Self protection and AEA
- Countermeasures Dispenser System based on BOP and BOL dispensers further improved by more flexible BOL installations



# GRIPEN NG - EW SYSTEM MISSILE APPROACH WARNING

- ▶ Space is allocated for MAW sensors on the aircraft
- ▶ Initially a UV based MAW will be evaluated (MAW 300)
- ▶ Two color IR MAW can in the future be installed dependent on the maturity of the technology and an acceptable price





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