Future Trends in EW Self-Protection Testing

Dr. Luca Pergola
Product Manager
RUAG MRO Schweiz
Pretoria, 6. November 2019

Together ahead. RUAG

Future Trends in EW Self-Protection Testing
Outline

- Where are we today?
- The new challenges
- The future is now: IR Sensors and Testers
- The future is now: DIRCM Systems and Active Decoys
- Visions for the Future: Long Range Remote Testing
- Visions for the Future: Smart Expendables
- Visions for the Future: Interconnected Platforms
- Conclusion

Future Trends in EW Self-Protection Testing

Where are we today?

Air to Air Missiles

Laser Range Finder
& Designators

MANPADS

Ground to Air Missiles

Radar Acquisition
& Tracking

Together
ahead. RUAG

Future Trends in EW Self-Protection Testing

Where are we today?

Future Trends in EW Self-Protection Testing
The new challenges

Aircraft are smart… threats are getting smarter

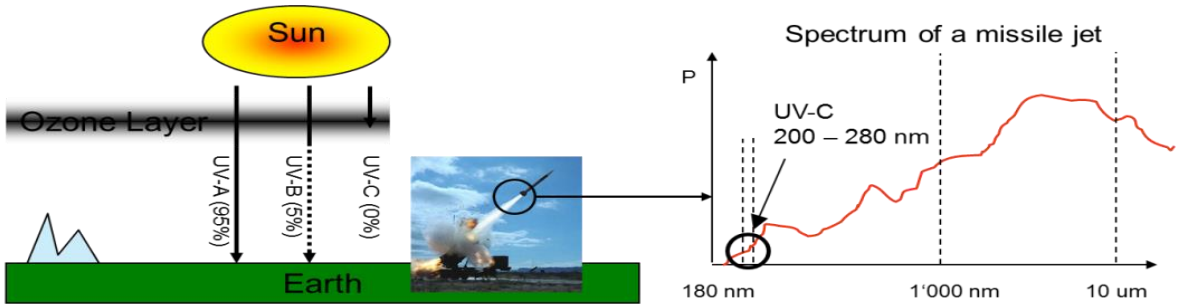
Missiles are becoming less influencable by chaff or flare deployment

Missiles can be controlled also when the engine is no longer running: UV detection does not work in this case

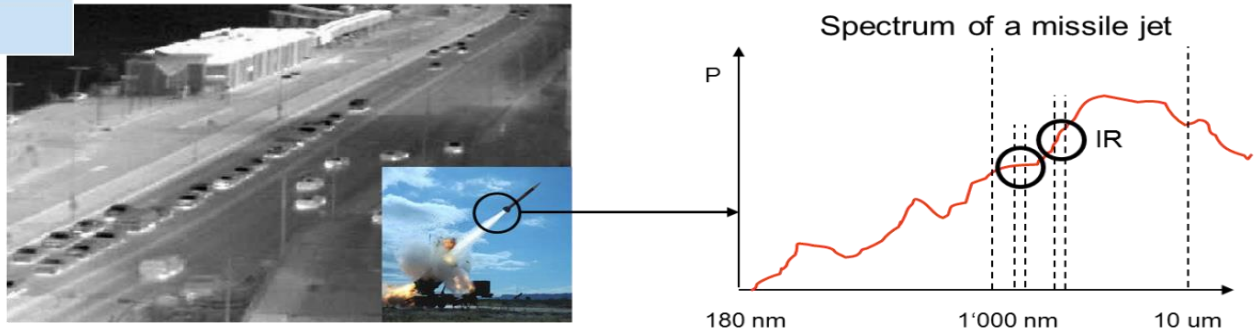
Radar patterns are becoming increasingly complex and can be hidden between commercial radio emissions

Future Trends in EW Self-Protection Testing

The future is now: IR sensors and testers



Advantages	Disadvantages
- High sensitivity - Low UV-C pollution	- No missile track after burn-out - Medium false-alarm rate

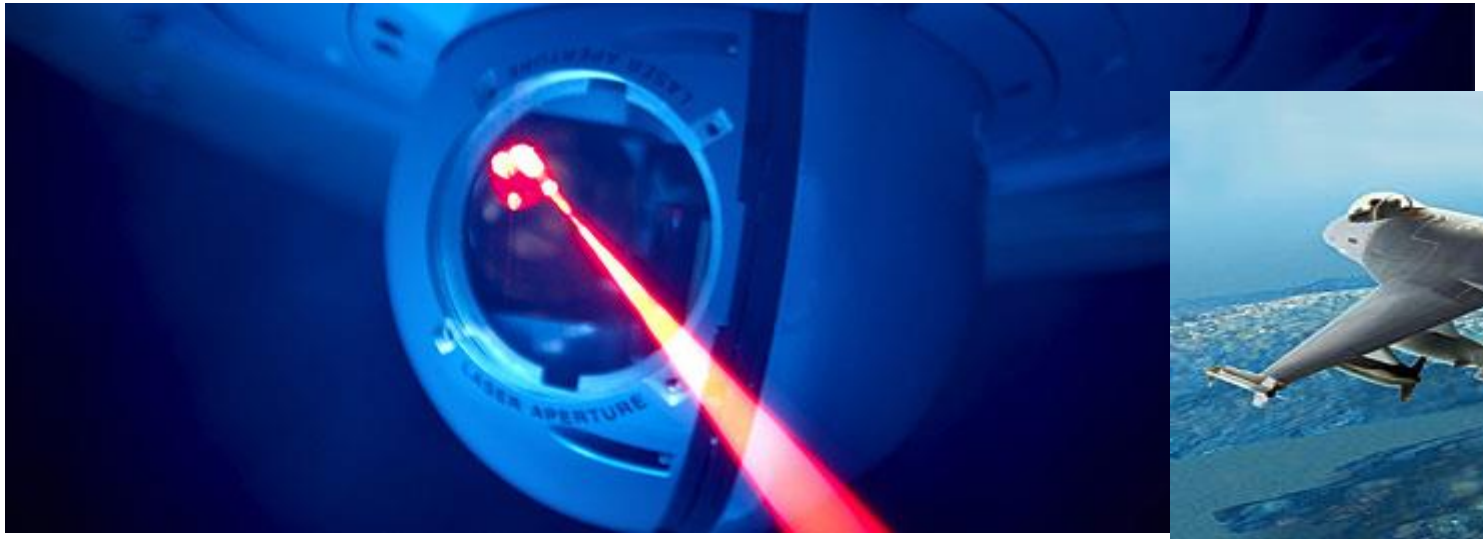


Advantages	Disadvantages
- Missile track after burn-out - Typically lower false-alarm rate	- Complex picture analyses - Dual color detector required for better detection/low false-alarm rate

Together ahead. RUAG

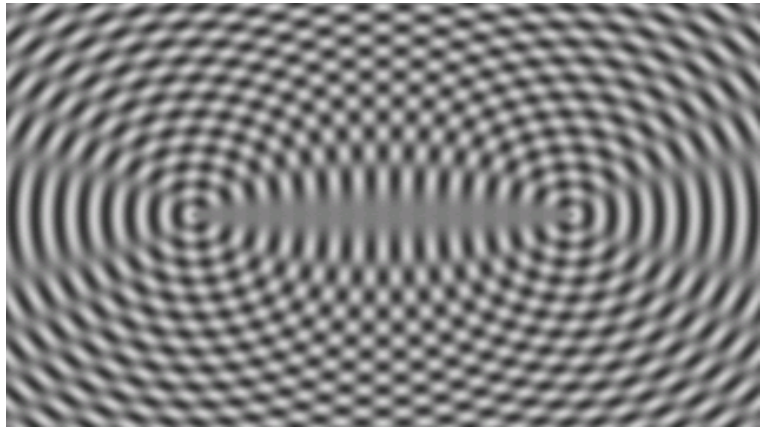
Future Trends in EW Self-Protection Testing
The future is now: DIRCM and Active Decoys

Directional InfraRed Counter Measure



Decoy

Future Trends in EW Self-Protection Testing
Under Research: Active Cancellation



Passive Stealth Techniques aim at reducing the Radar Cross Section

Jammers create a signal aiming at decresing the signal to noise ratio of the enemy radar

Active cancellation works like headphone's noise cancellation: the aircfraft self protection system analyses the incoming radar signal and sends out an equal signal in phase opposition.

Future Trends in EW Self-Protection Testing
Trends in Testing Equipment

Programmable

Close-Loop testing

End-to-end testing

Emitting and measuring at the same time

Future Trends in EW Self-Protection Testing

Visions for the Future: Long Range Remote Testing

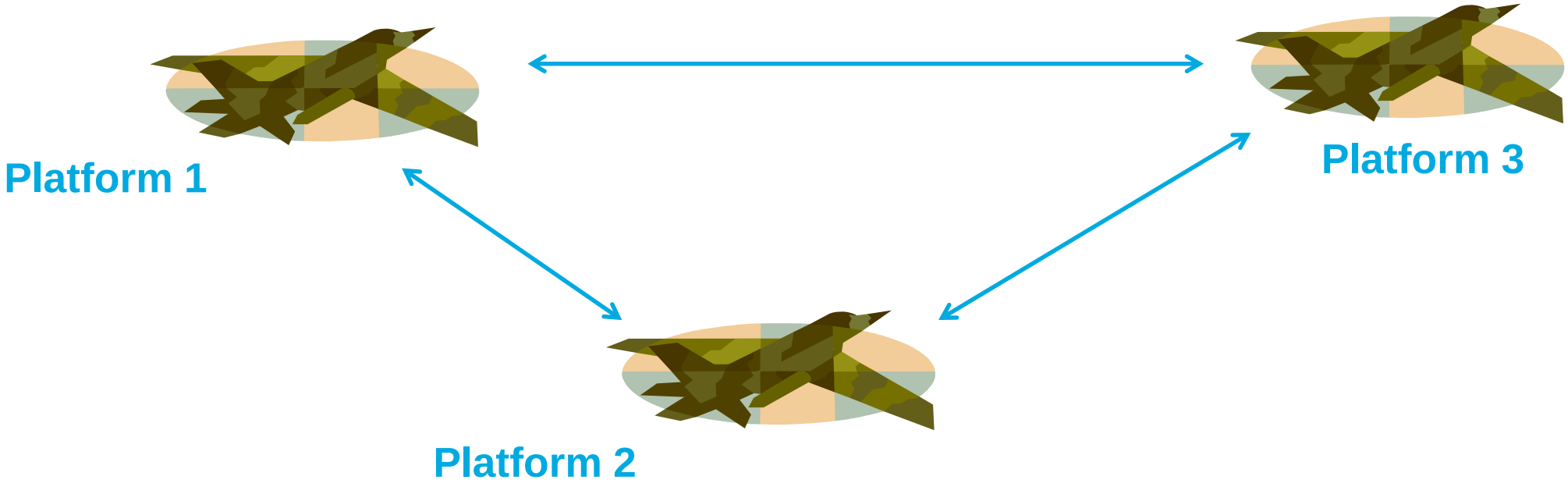
EW Systeme with Chaff/Flares

DIRCM – Directional Infrared Countermeasure

Together ahead. RUAG

Future Trends in EW Self-Protection Testing
Visions for the Future: Off-Boarding

Interconnected Platforms



Future Trends in EW Self-Protection Testing
Visions for the Future: Smart Expendables

- In-flight programming of essential parameters
  - Multi-shot dispense intervals
- Automatic Payload identification
  - Payload Type: eliminating loading errors
  - Payload Manufacturer, Lot number and date of manufacture
- Payload Management - Optimization
  - Dispense “oldest” cartridges first
- Automation of Life Management
  - Operational Life (Calendar time)
  - Air Carriage Life (Flight hours)
  - Including the particular platform details

Future Trends in EW Self-Protection Testing
Visions for the Future: Smart Test Cartridges

- Cartridges as measurement devices of the dispenser electrical behaviour
- Cartridges as emitters for EW testing
- Closed Loop with the test emitters

Future Trends in Electronic Warfare
Conclusion

- Threats are becoming increasingly complex
- Countermeasures are also getting complex, both to be used and tested
- Measurement and test systems have to evolve accordingly
- Programmability and multi-functionality are the key points

Thank you very much for your attention!