An Approach to Electromagnetic Spectrum Evaluation and Control for Situational Awareness

4th Biennial Conference

Presented by K Olivier
Co-Authored by C Cloete
Date 10 October 2012

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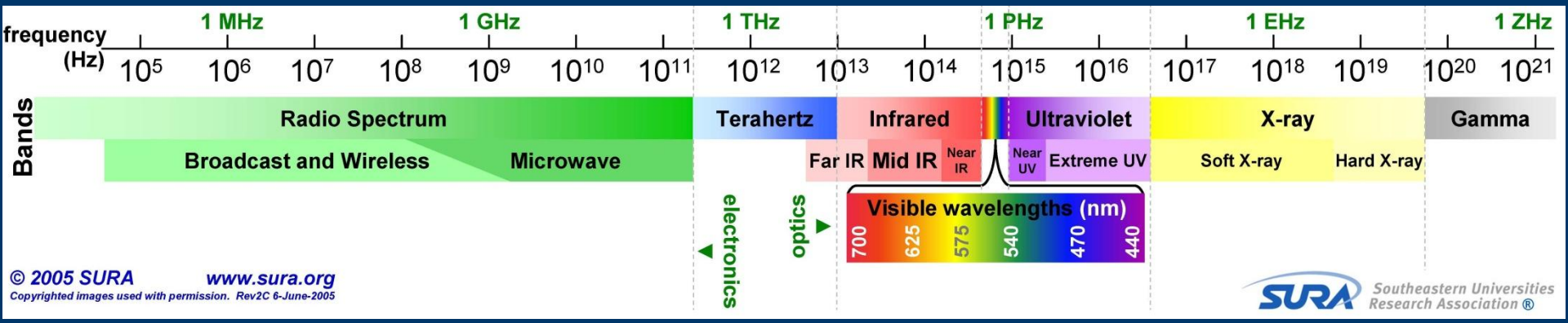
Electromagnetic Spectrum (EMS) Overview



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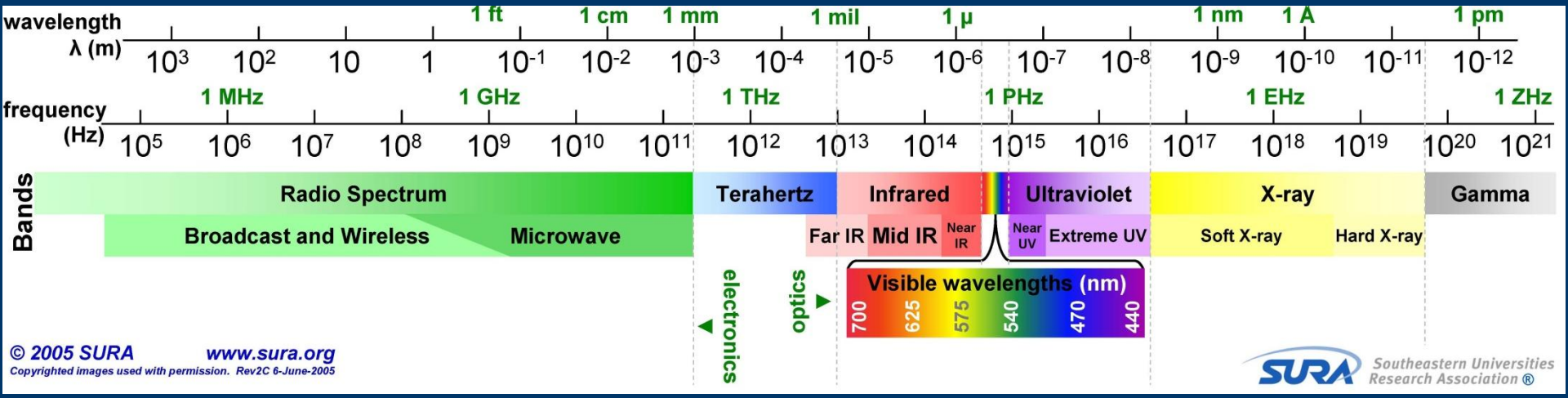

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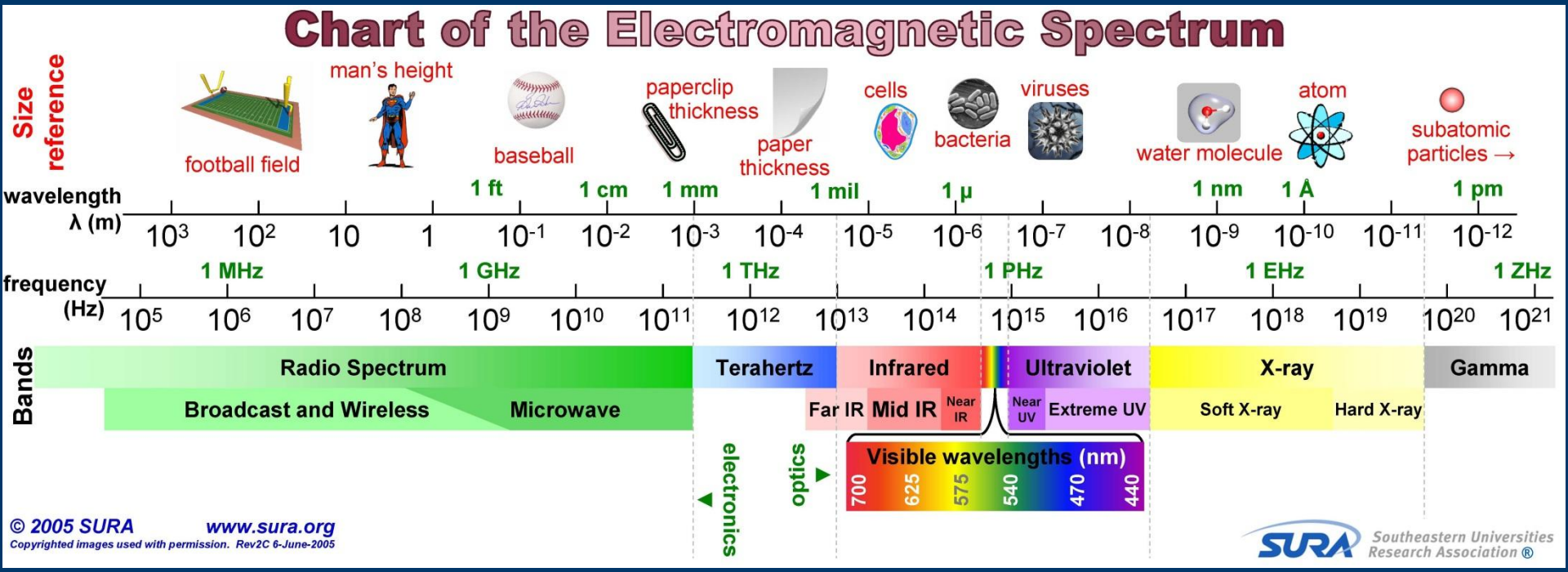

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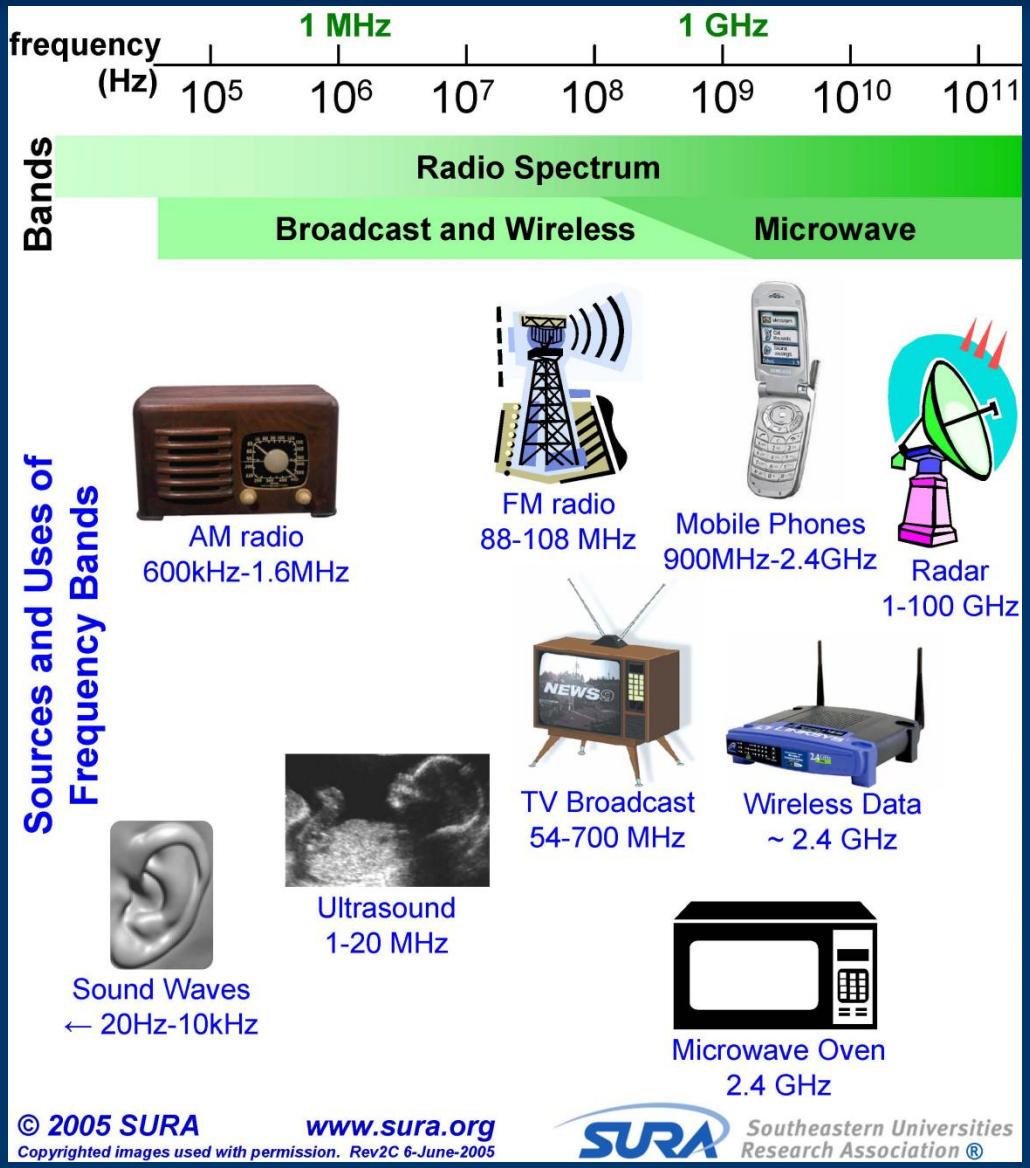
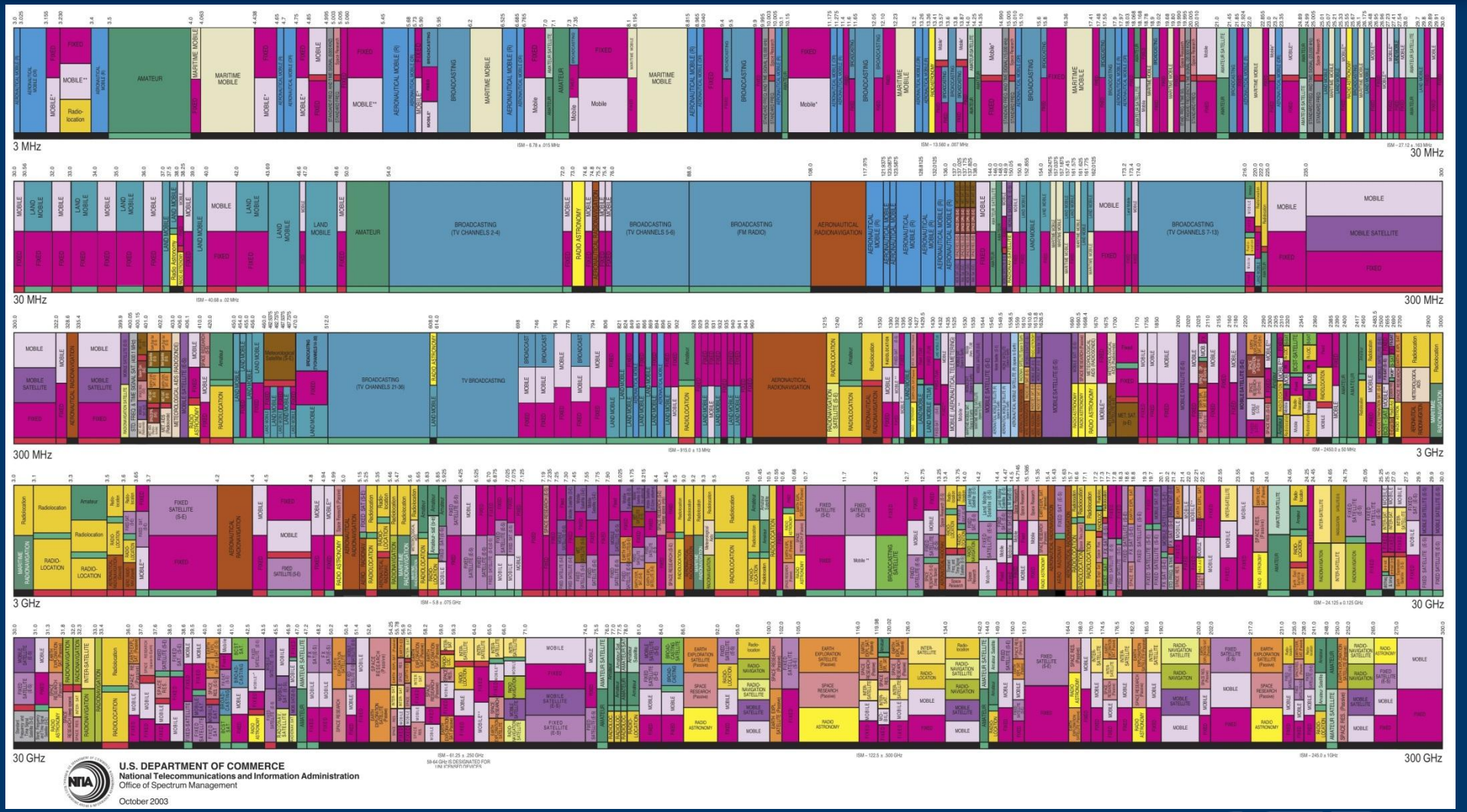
Electromagnetic Spectrum (EMS) – RF Band Only



RF Spectrum Allocation Chart



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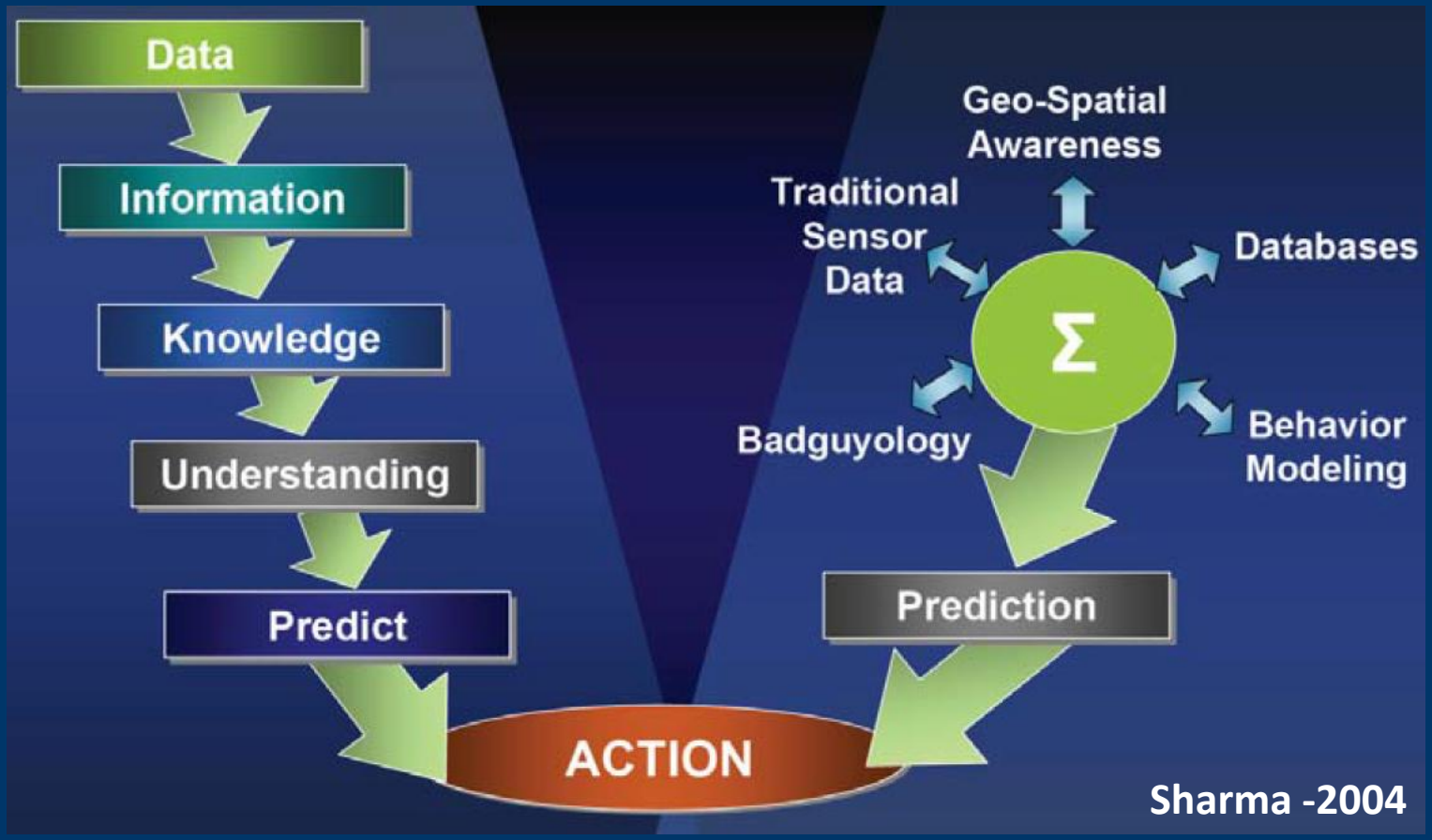
Situational Awareness

"The perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future" - Endsley



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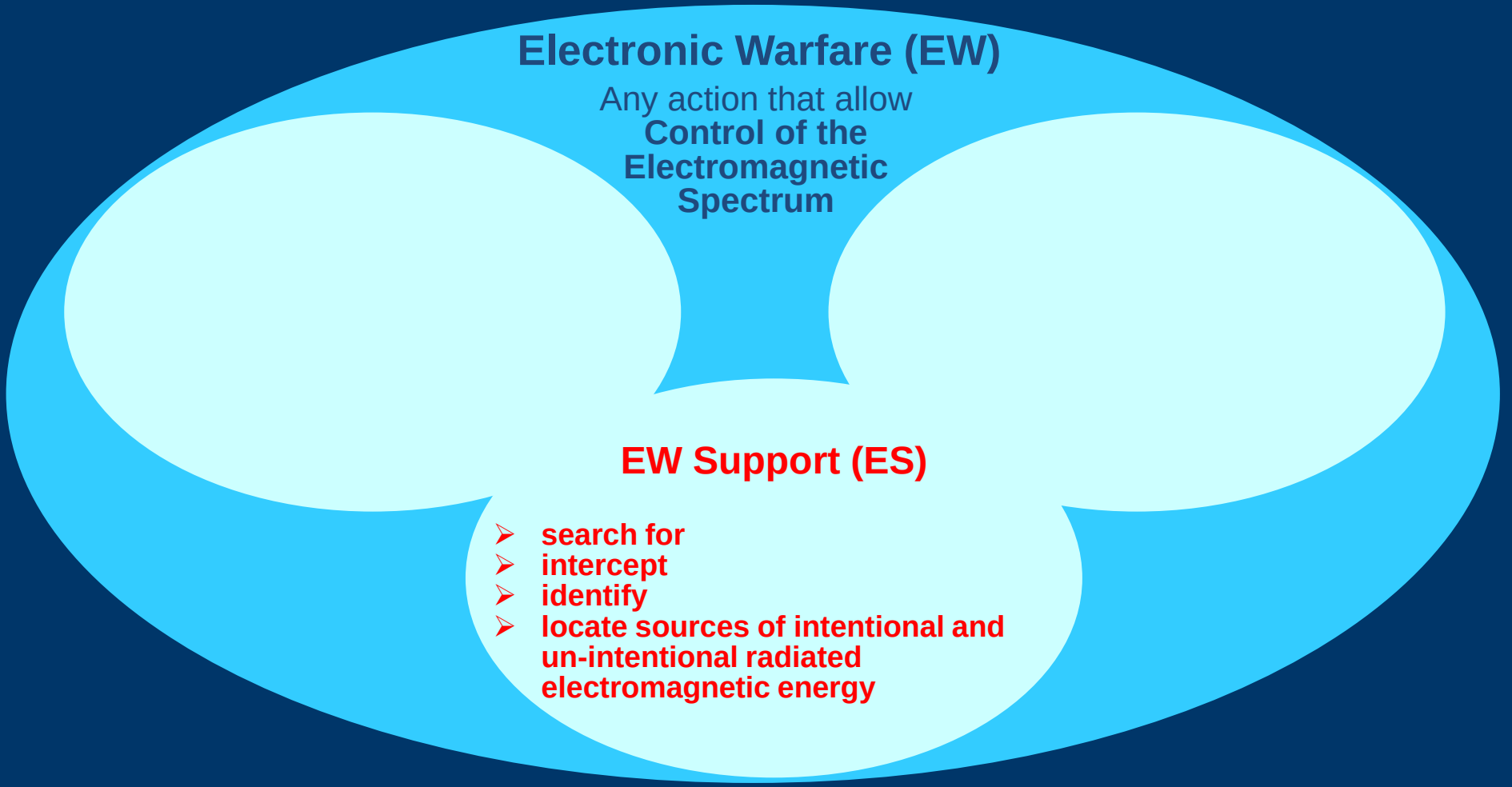
Electronic Warfare (EW) Concept



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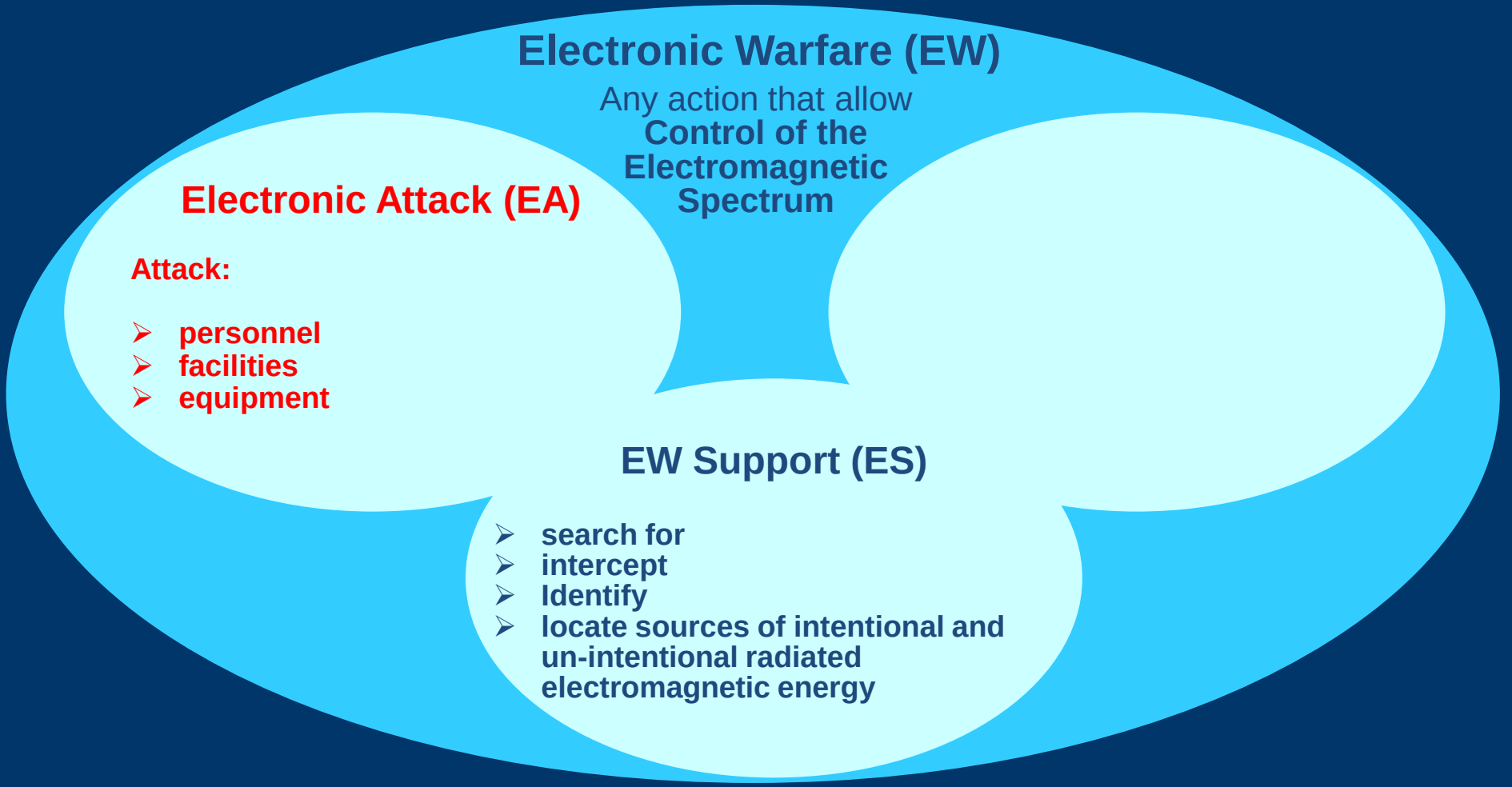
Electronic Warfare (EW) Concept



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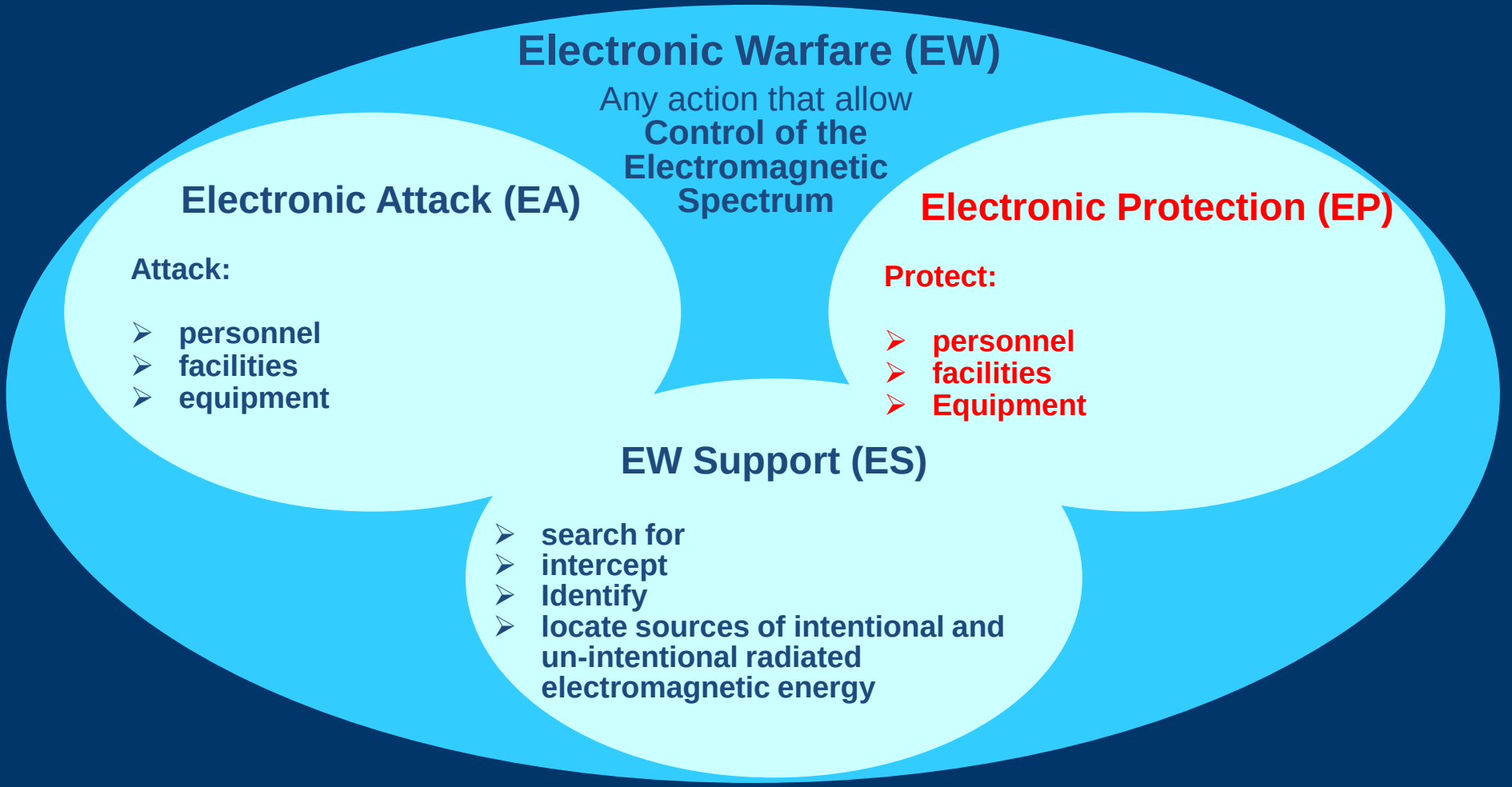

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Goal of Talk

"An Approach to Electromagnetic Spectrum Evaluation and Control for Situational Awareness"

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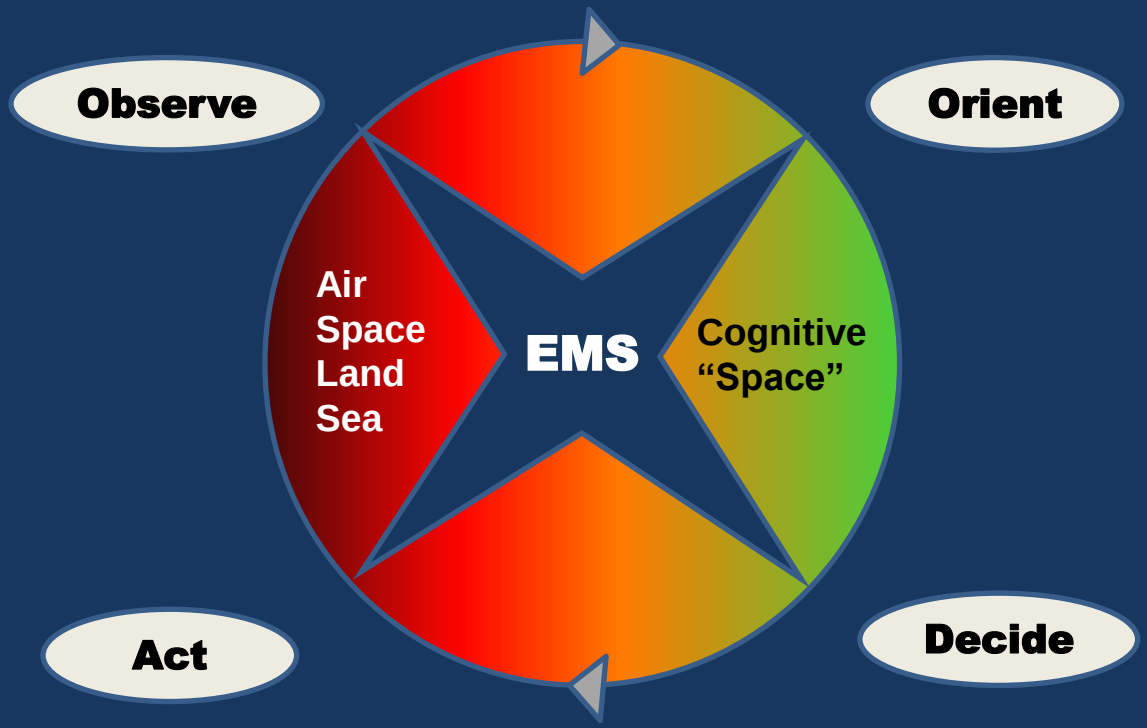
Goal of Talk

Sensors

Situational Awareness



OODA Loop – John Boyd

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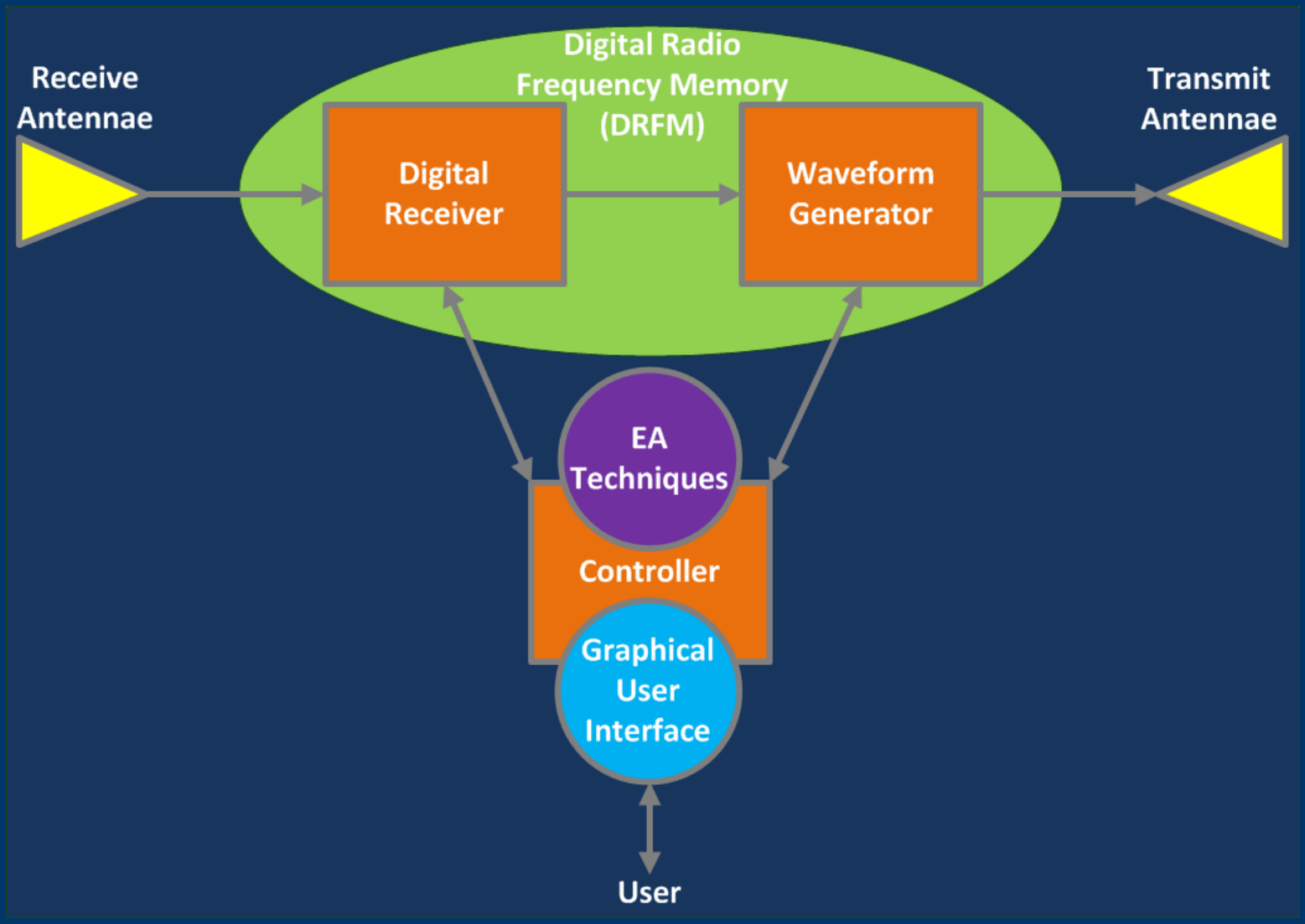
CSIR Developed EW Research and Evaluation Facility



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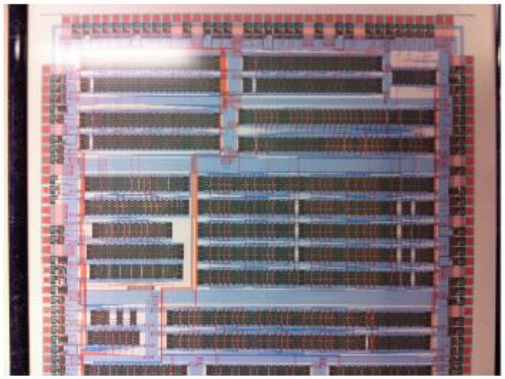
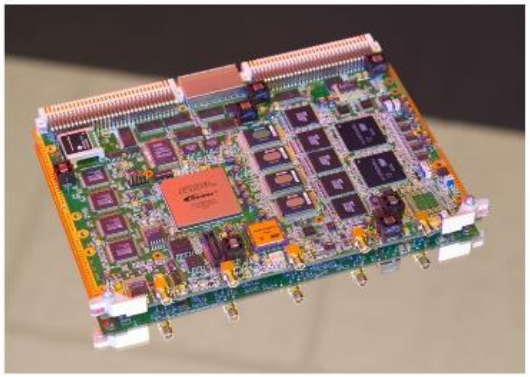
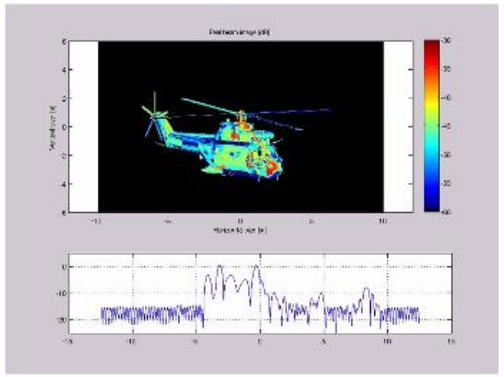
DRFM History at CSIR

Digital Radio Frequency Memory History







199x 1999 2004 2007 2009 2010 2012

DRFM Technology Development Projects

1st Gen 2nd Gen 3rd Gen 4th Gen Complex targets Clutter 5th Gen

IBW: 400 MHz 500 MHz 800 MHz 2 GHz

User Benefits

- Support Smart Buyer and Doctrine Development
  - CSIR provides EW related advise to the SANDF
  - CSIR provides inputs for Doctrine development by the SANDF

- Operational Support
  - EW Facility can be used for Situational Awareness
  - CSIR performs the actual evaluations
  - Examples of major platform support includes:
    - SAAF – Gripen Radar
    - SA Navy – Frigates Radars

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User Benefits

- CSIR Industry Collaboration
  - Communications EW
    - Peralex
    - GEW Technologies
  - Radar evaluation
    - Reutech Radar Systems
  - Missile sensor technology
    - Denel Dynamics

- SANDF Exercises and Operations
  - CSIR is involved in regular scheduled EW camps – Force preparation
  - Operation Corona

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Conclusion

- ES role is crucial to establishment of Situational Awareness
- Adversary changes approach regularly
- CSIR aims to enhance the survivability of platforms and personnel

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Thank you

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