

THE EM SPECTRUM IS CHANGING

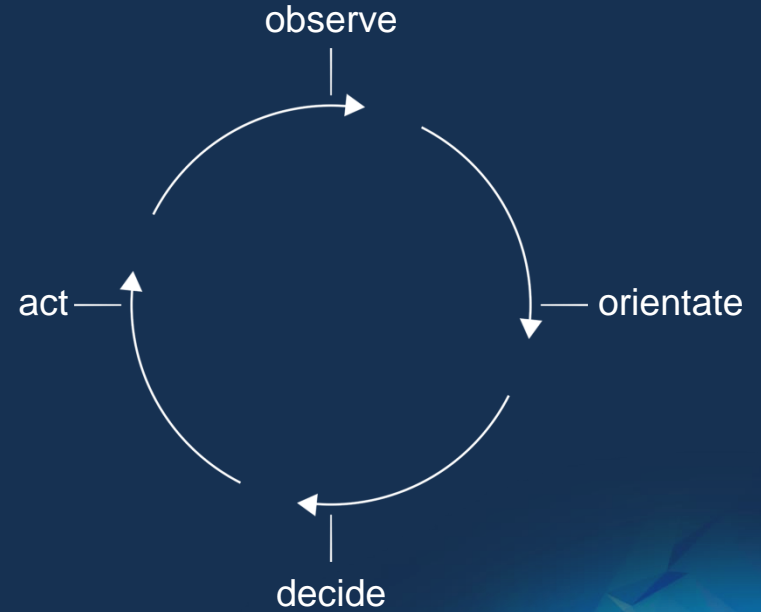
EXPLOITING YOUR DATA TO ACHIEVE OPERATIONAL ADVANTAGE

- Definition of terms
- Statement of the problem
- Review the impact and effect
- Consider potential solutions
- Look at the benefits of the solutions
- Review the future

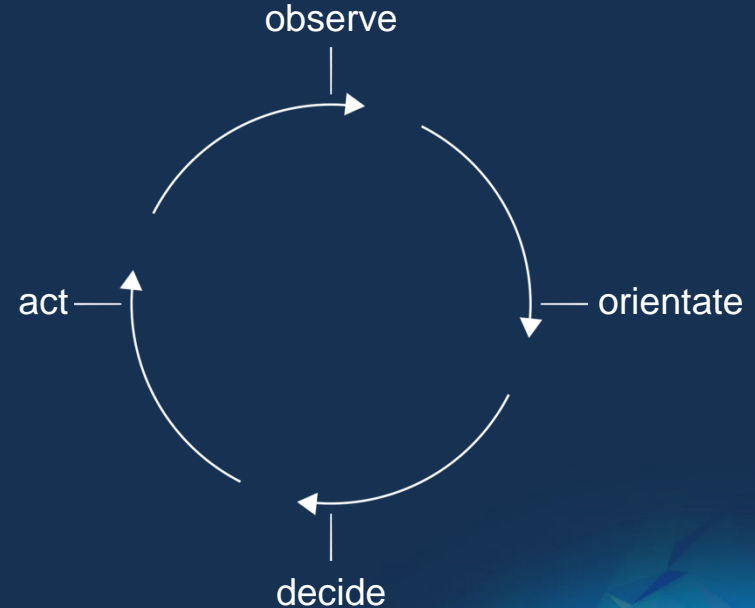


- OODA Loop

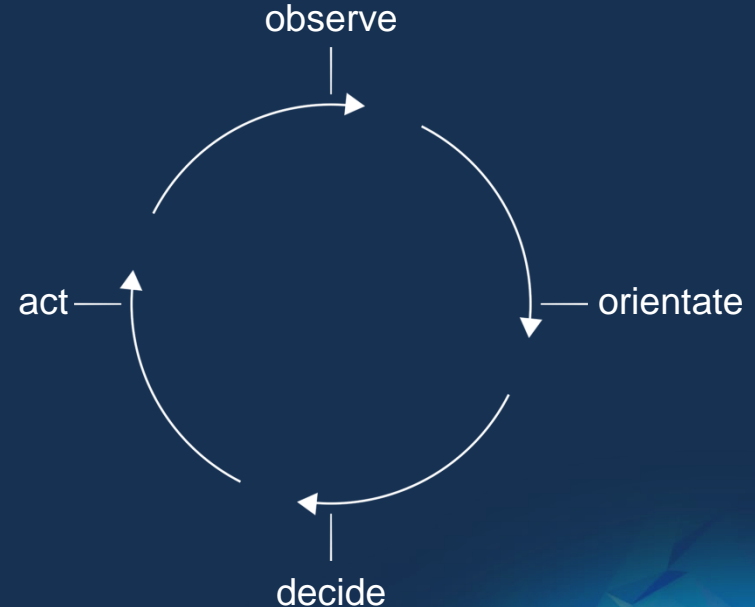
- Observe, orientate, decide, act
- Achieving operational advantage



- OODA Loop
 - Observe, orientate, decide, act
 - Achieving operational advantage
- Electromagnetic environment synergies with air power
 - Air supremacy
 - conduct of operations at a given time and place without prohibitive interference
 - Air superiority
 - the opposing force is incapable of effective interference within the operational area
 - Degree of freedom to exploit and manoeuvre in the electromagnetic environment

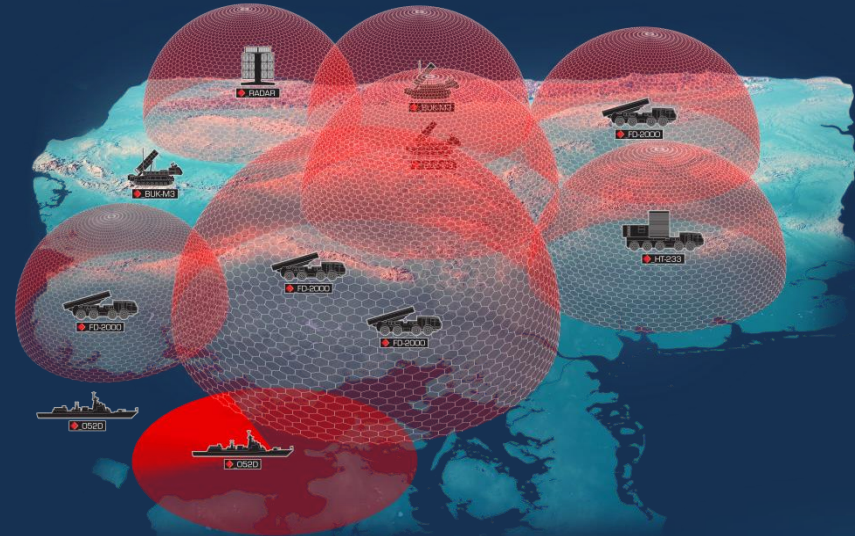


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 - Degree of freedom to exploit and manoeuvre in the electromagnetic environment
- Can you achieve supremacy or superiority?



- Complexity of the operational environment
- Generation of and need for data
- Increasingly complex and evolving threats
- Increasing number of users in the electromagnetic environment

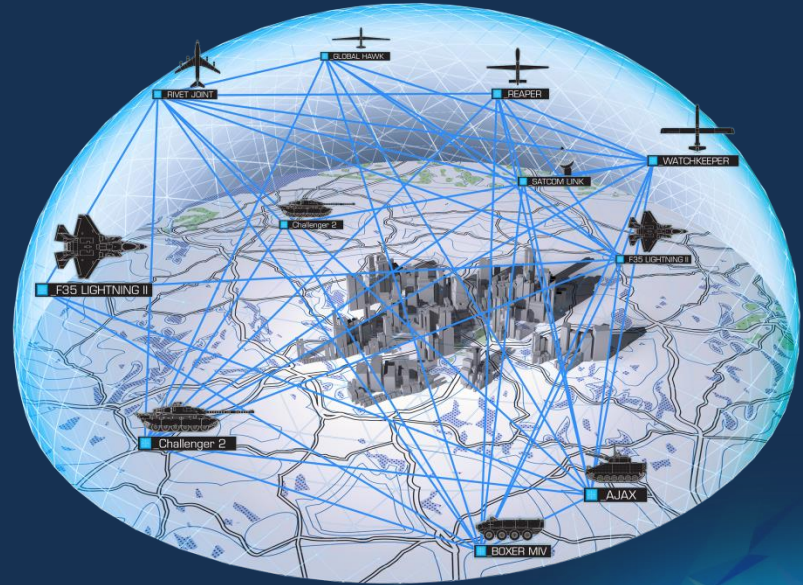
- Complexity of the operational environment
- Generation of and need for data
- Increasingly complex and evolving threats
- Increasing number of users in the electromagnetic environment
- Adaption of tactics, techniques and procedures
 - Freedom of manoeuvre requirement
 - Maintain operational effectiveness



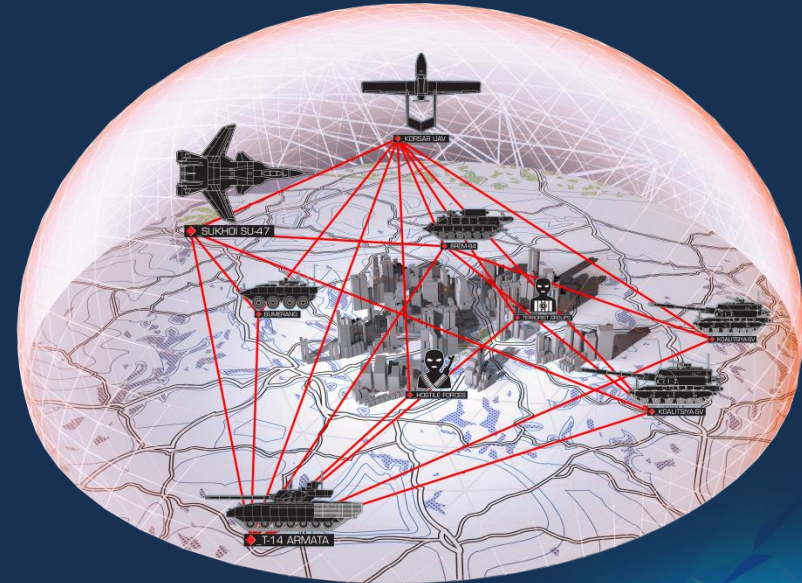
- Operational manoeuvre in the congested and contested electromagnetic environment
 - Constrained freedom of manoeuvre
- First to move and first to act advantage is lost
 - We are no longer moving around the OODA loop quicker than our foe
 - Operational advantage is lost



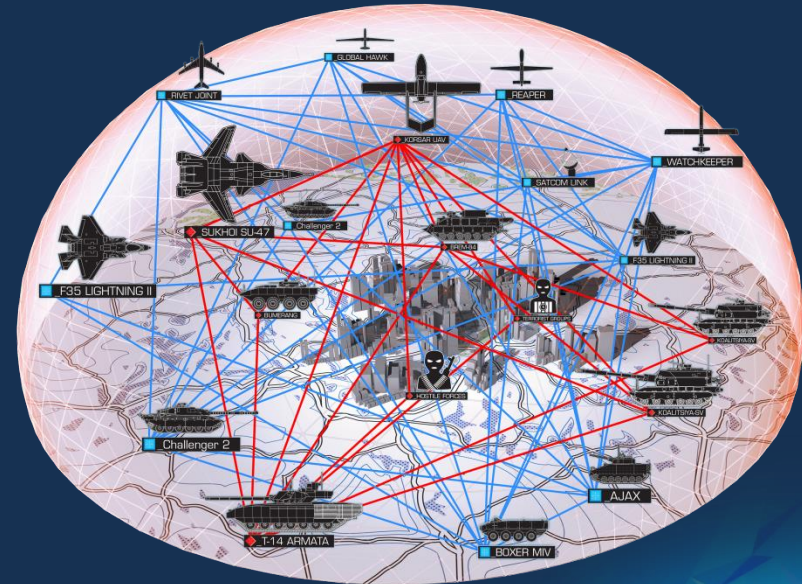
- Better use and integration of existing data and people



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 - Disrupt the kill chain
 - Mitigate the anti-area access denial (A2AD) threat



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- Synergies with other environments, including cyber (CEMA)
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- Baseline the electromagnetic environment
 - Enable freedom of manoeuvre and spectrum supremacy
 - Enhanced understanding
- Reduced time in countermeasure development
- Networking of capabilities
 - Freedom and passage of data
 - Understanding of data



- Use of Artificial Intelligence (AI)
 - Supporting the decision maker
 - Man “on the loop” not “in the loop”
 - Offers critical thinking time
 - Indicators and warnings (I&W)
 - Enables the ‘first to move’ advantage



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- Moving up the kill chain
 - Fight the system not the missile
 - Early countermeasure employment



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- Training



BENEFITS OF THE SOLUTION

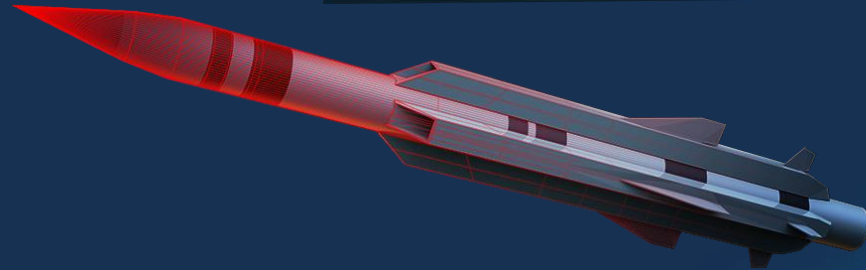
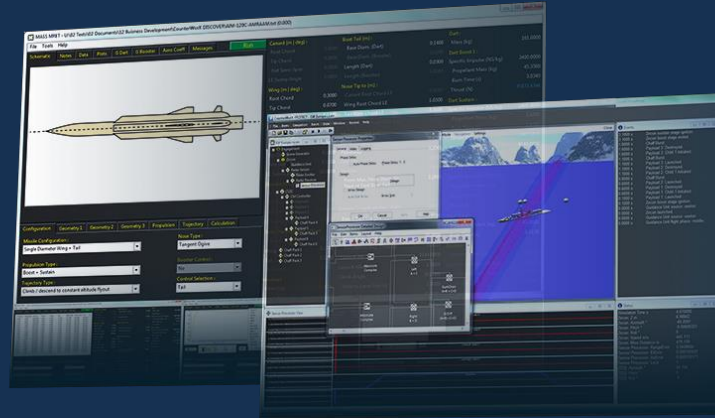
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 - Effectiveness of TTPs
 - Appropriateness of countermeasures
- First to move on the OODA loop
 - Heightened sensor to shooter link



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 - Appropriateness of countermeasures
- First to move on the OODA loop
 - Heightened sensor to shooter link
- Mitigate the A2AD threat
- Timely analysis of volumes of data
- Critical thinking time
 - Expose the digital thread / footprint



- Data to decision concept (D2D)
 - Aligned to the kill web concept



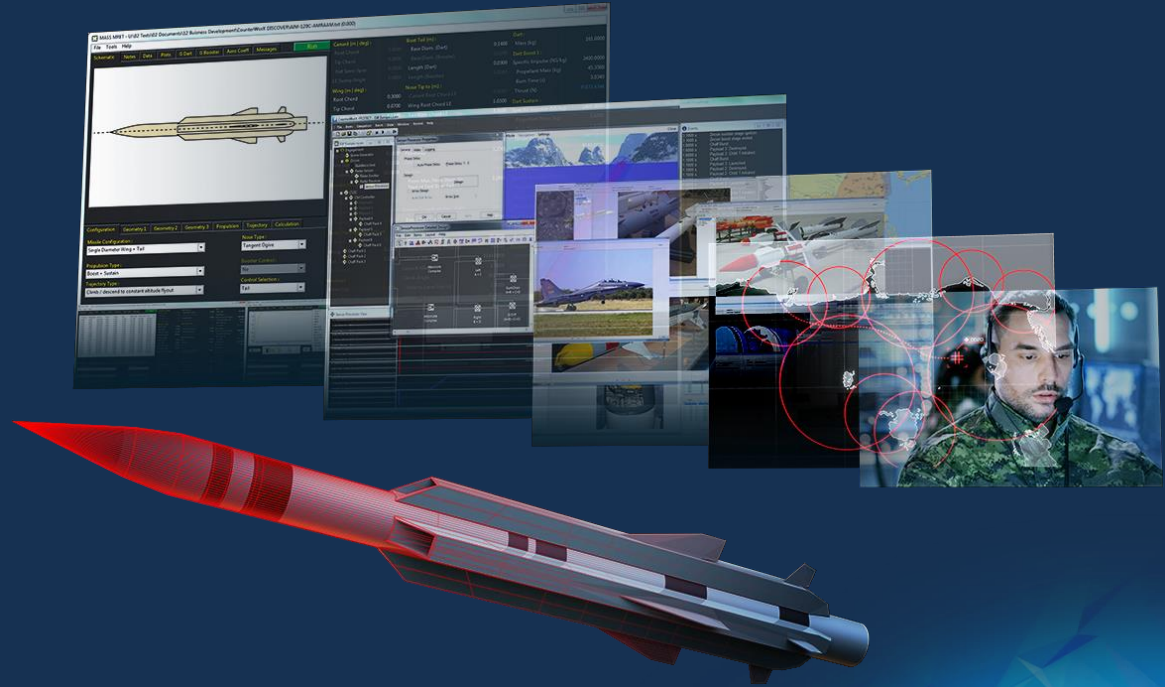
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- Data to train from or data to fight from?



- Domination and operational manoeuvre within the electromagnetic environment
 - Application of capability not equipment
 - Use of data and trained personnel
- Understand and control the data
- Be first to move



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“In future conflicts, the winner will be the one who turns data into information dominance quicker than our adversary”

General Sir Gordon Messenger
Vice Chief of the Defence Staff