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Ensuring Air Operations in the Presence of Advanced Threats

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Strategies of Russia and China in Warfare

- In war with a peer/near-peer, Russia's military will attempt to use indirect action and asymmetric responses across multiple domains
- Russia will attempt to terminate a conflict quickly, using a series of measures that aim to control escalation dynamics
- Conventional and unconventional warfare approaches will likely be mixed
- Russia will likely focus on disrupting, degrading, or destroying adversary command and control and enemy power projection capabilities

- PLA's approach to warfare has been shaped by systems thinking – modern conflict is thought of as between opposing "operational systems"
- PLA seeks to wage "system destruction warfare", not necessarily attrition warfare
- Degrading information flows, critical systems, operational architecture and timing are goals
- Key targets include command and control (C2), reconnaissance intelligence, and firepower capabilities

Ref 1, 2

Growing Threats to Air Operations

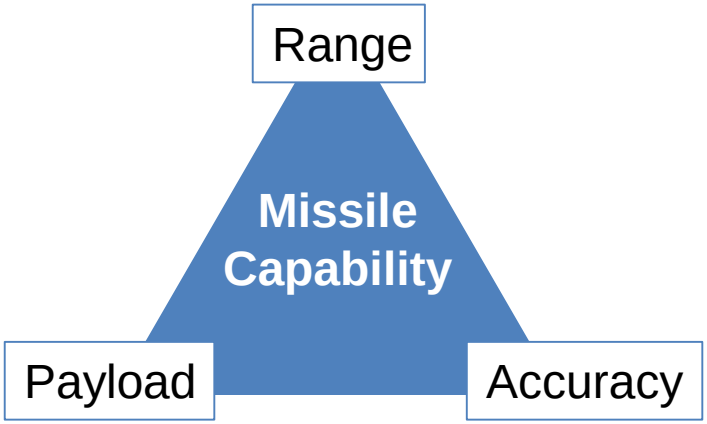
Kinetic threats while in the air

Reduced signature aircraft

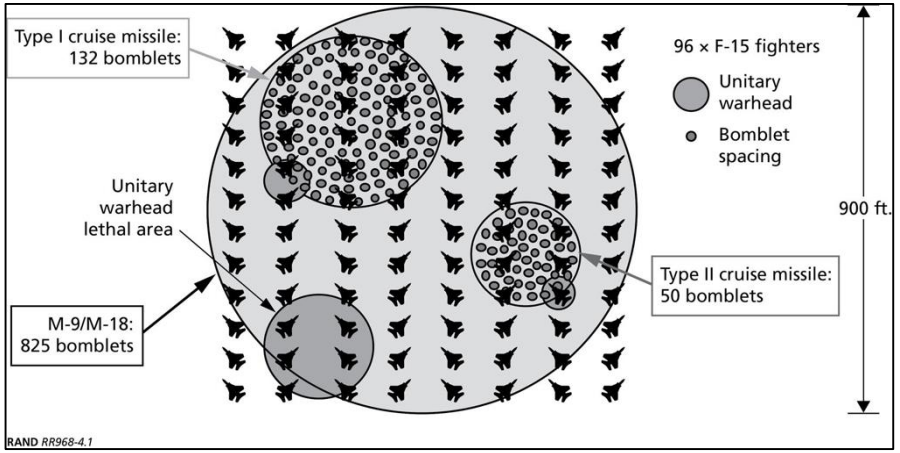
Long range surface-to-air systems

Long range air-to-air missiles

Kinetic threats while on the ground



Ballistic and cruise missiles



Ref 3,4, 5, 6

Growing Threats to Air Operations

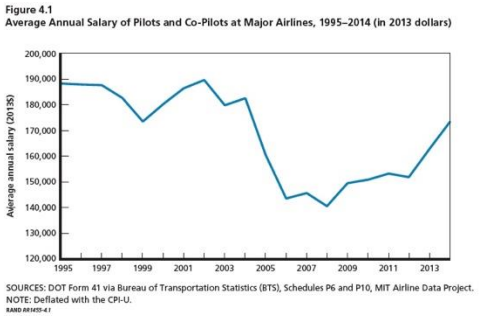
Threats to air operation enablers

Contesting space operations and spectrum

Cyber operations against military targets

Hackers are targeting
defence industry employees

Threats to retaining skilled airmen



One example - Increased commercial airline hiring and higher pay

Leads to lower military pilot retention

Ref 7, 8

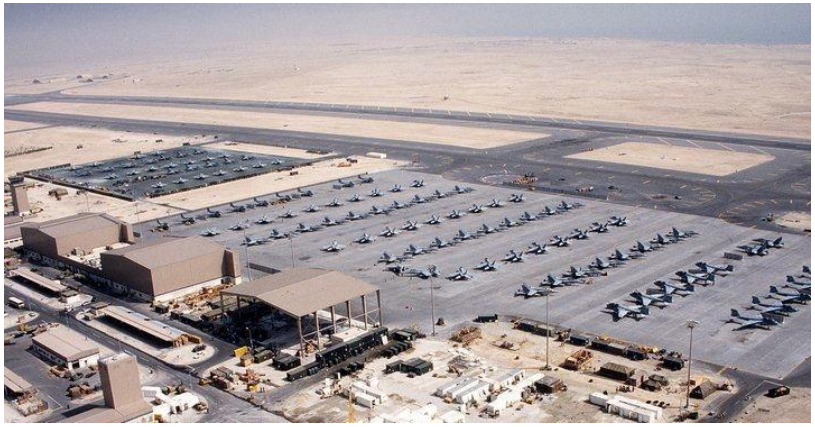
Strategies to Ensure Air Operations

- Start to ensure air operations during system procurement
  - Secure the entire supply chain
  - Design for cyber security early in system acquisition
  - Weigh risk vs benefit when cyber connecting systems
- Survive in the air
  - Continue to pursue things airmen have done to survive over time
  - Recognize that “weak links” are threatened from long distances
    - Command and control aircraft
    - Air refuelling
    - ISR platforms
    - Enabling capabilities (communications, GPS, cyber systems)

Strategies to Ensure Air Operations

Survive on the ground

- Improve active defences (systems and CONOPS)
- Harden base assets (when it makes sense)
  - Aircraft shelters
  - Fuel
  - Sleeping and eating quarters
  - Command centres
- Disperse aircraft (on-base and to many bases)



Shaikh Isa, Bahrain, Early 1991

Ramstein Air Base, 2014 via Google Earth

Strategies to Ensure Air Operations

Survive on the ground

- Employ camouflage, concealment, and deception
- Minimize time on ground while under missile threat
- Plan to recover the air base after attack

Strategies to Ensure Air Operations

- Mind the vulnerable links
  - Protect airborne refuelling, command and control, and ISR assets
  - Protect the AOC from kinetic and non-kinetic attack
  - Understand the vulnerabilities of enablers and protect them
- Utilize and integrate all available tools
  - Effectively employ multi-domain capabilities
  - Examine new command and control concepts
  - Understand and integrate the capabilities of allies and partners
  - Train to situations where various enablers are degraded or lost
  - Retain the best and brightest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