USAF Operational Training: Establishing New Requirements

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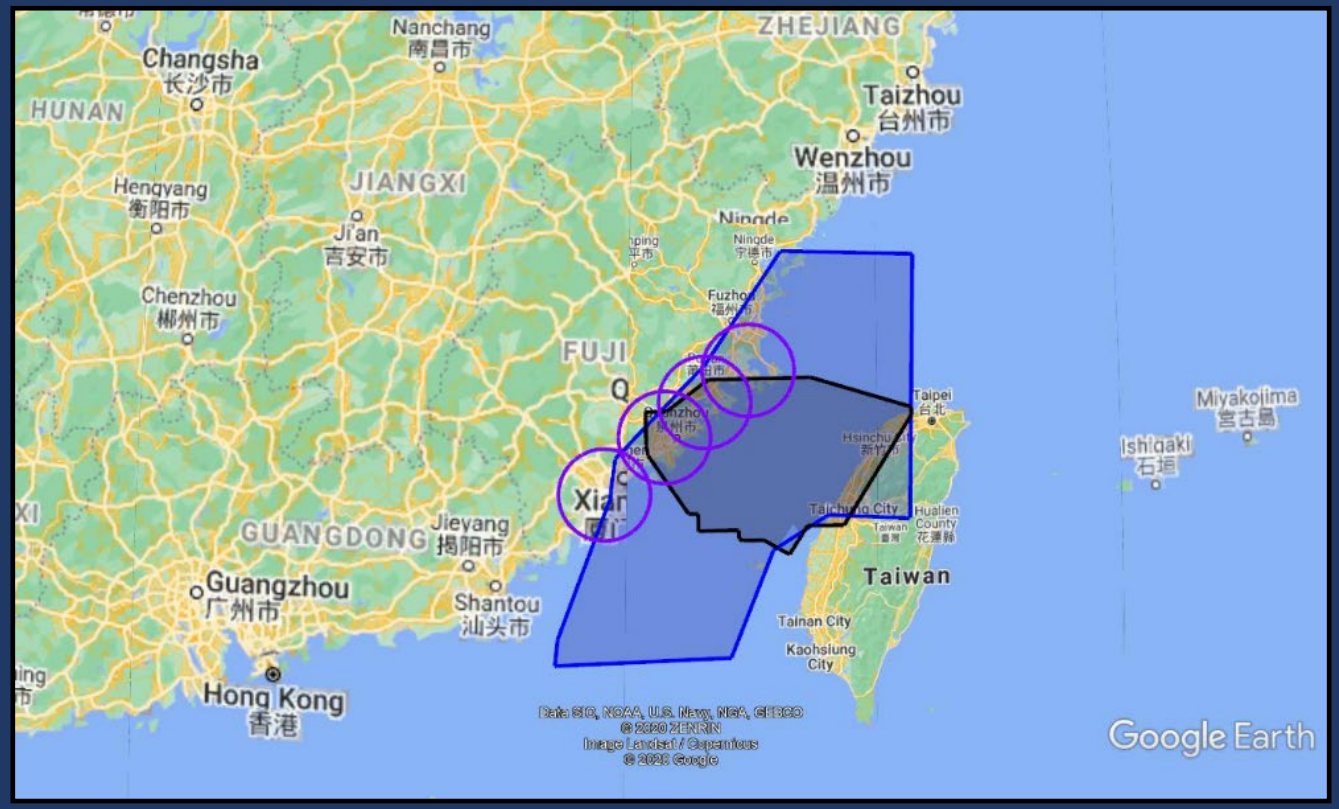
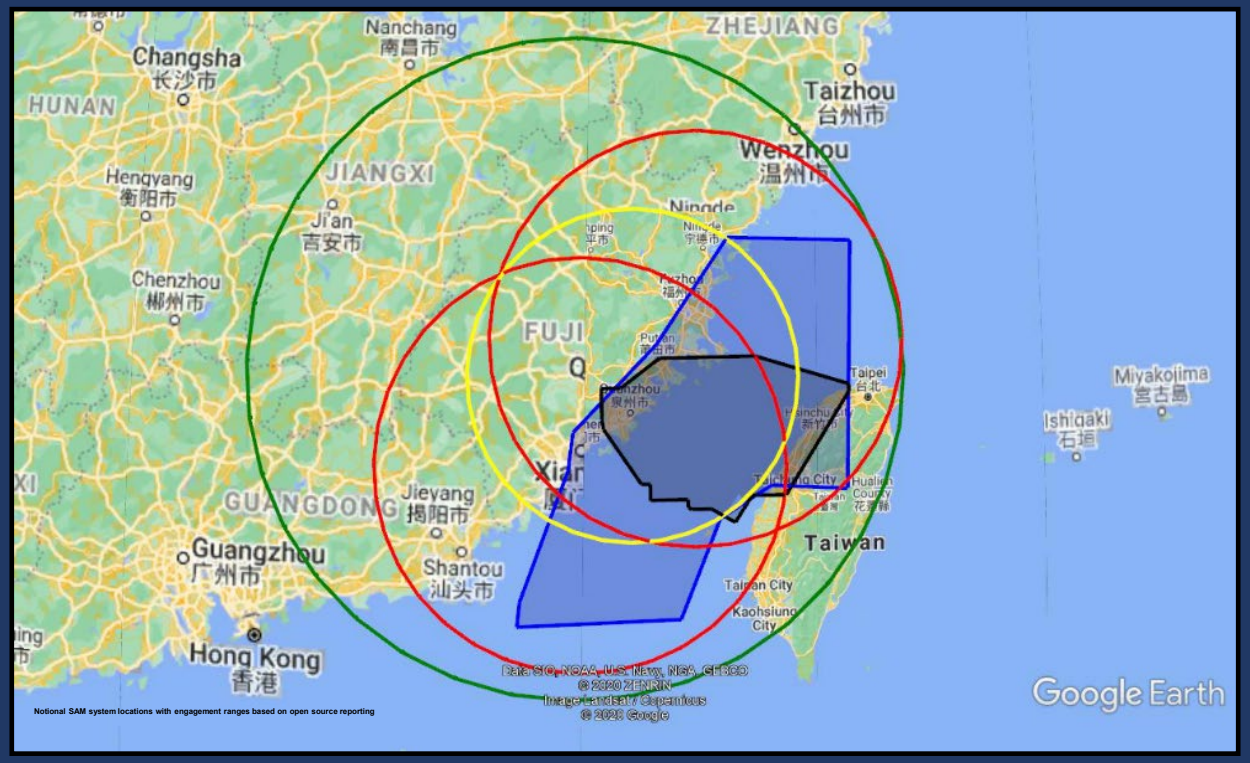
The Operational Environment – Then and Now

- **Then: 1980s through Early 2000s**
- **Biggest challenge: Soviet / FSU capabilities**
- **Range / Airspace:**
  - **Size Required: Nevada Test and Training Range + MOAs**
  - **“Marshall in the East, Push to the West”…relatively short vuls**
- **Threat Characteristics**
  - **Well-Understood, Definable Designs**
  - **Distinct EW/GCI/TAR/TER**
  - **Single-digit and first gen double digit SAMS**
  - **Air: GCI-controlled fourth gen fighters**
  - **Rudimentary EW environments**
- **Our Force**
  - **Undeniably superior designs…at scale**
  - **World-leading Tactics, Techniques & Procedures**
  - **Strategic Depth (Geography and Force Structure)**



The USAF and Allies Trained and Dominated in This Environment

The Operational Environment – Then and Now



- **Now: 2020s into the future**
- **Biggest challenge: China's capabilities**
- **Range / Airspace:**
  - **Size required: greater than any existing range**
  - **Need for a multi-access, campaign-level scenario over vast distances with high threat density**
- **Threat Characteristics**
  - **Advanced digital arrays**
  - **Multi-mode detection, very long-range SAMS**
  - **Air: fifth-gen fighters with very long range missiles**
  - **Advanced EW environments**
- **Our Force**
  - **Superior Designs…but lead is slipping**
  - **Other nations openly copying our TTP playbook**
  - **No sanctuary / Outnumbered at the Tactical Edge**

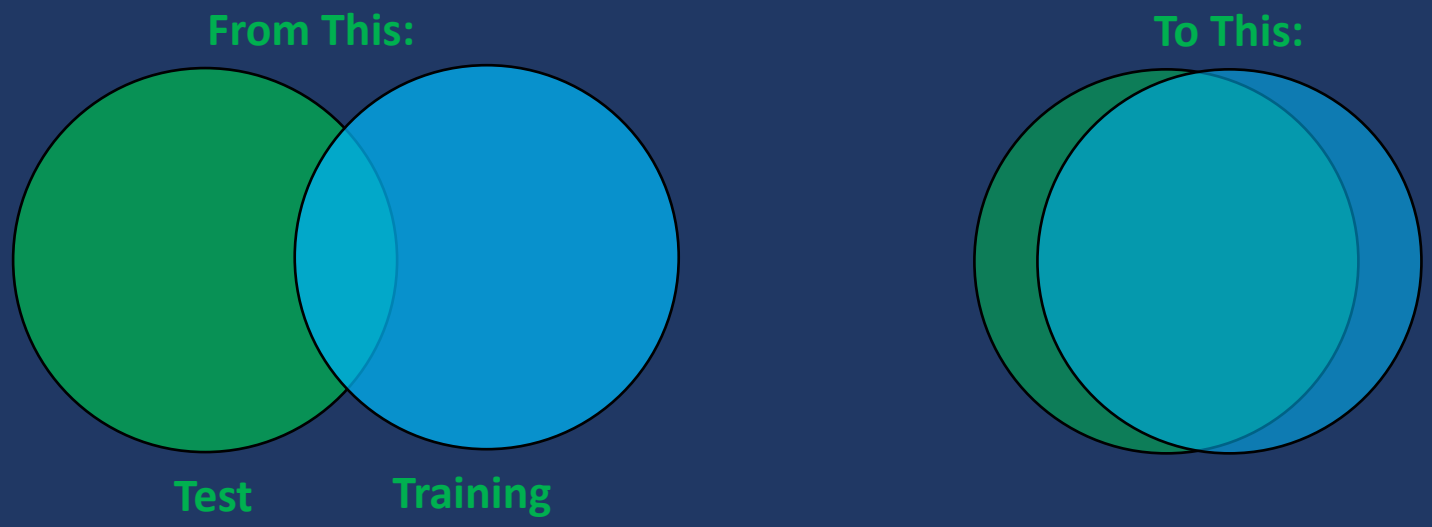
What We Did Then Isn't Good Enough Now

New Requirements

- **Blending of Test and Training / TTP Development**
- **Transition our highest-end training to the Synthetic arena**
- **Keep our live Ranges relevant**
- **Change our Adversary Air enterprise to better replicate the threat**
- **The Future of Live, Virtual, Constructive (LVC) = Blended**

Blending of Test and Training / TTP Development

- **Test and Training remain separate activities but**
  - **Work more closely together – get maximum value out of each activity**
  - **Common governance, transparent budgets, open communication**
  - **Accelerate both to the speed of relevance…Seek to "leap" rather than "pace"**
- **AF/A3 and AF/TE are now in full coordination on this effort**



Highest-end training to the Synthetic arena (1)

- **Conflicts like Desert Storm were "won on the Nellis Range"**
- **Future conflicts will be "won in a synthetic range"**

- **Why?**
  - **Geography of any live range or ranges is insufficient to replicate the vast distances our forces need to train for**
  - **Far greater density of potential threat systems than can be replicated**
  - **Security: TTPs and capabilities in open air can be exploited**

- **US and Allies need to develop Synthetic Ranges**

Highest-end training to the Synthetic arena (2)

- **The Joint Simulation Environment (JSE): AF's high-end training environment**
  - **Built on the F-35 test environment, shared in common with the Navy**
  - **Expanding into training – first at the Virtual Test and Training Center at Nellis AFB**
  - **5th gen fighter simulators, with man-in-the-loop threat simulators**
  - **USAF Guidance: all relevant players will use JSE**
  - **Government owned environment with robust contractor support, responsive to a rapidly changing threat**
  - **NOT distributed but co-located at Joint Integrated Training Centers and JSE enhanced local simulator facilities**

The JSE Training Vision

- Quantity = Frequency and Throughput
- Quality = Fidelity, Interoperability, and Environmental Relevance
- Fidelity
  - Positive training transfer - provide both stimulus and response that resemble the actual weapons system
- Interoperability
  - A mature single environment, pursuing industry protocols to ensure future simulator compliance
- Environmental Relevance – accurate representation of all attributes
- Before Quantity and Distribution, focus on a mature EMOE, and Quality (JSE in the VTTC)

Keep Our Live Ranges Relevant

- **Aircrew still need to fly in open air…for many reasons**
- **Push our highest priority ranges to closer replication of most challenging environment (“Level 4+”)**
- **Field more, and more relevant emitters**
  - **Move from static, specific threat replication to advanced, digital arrays**
  - **Moving from “Test Only” or “Training Only” applications**
  - **Moving toward “Blue v Blue”**
- **Working for expanded, and more useful airspace**
  - **Need realistic large force exercises in relevant geography**
  - **Live training will always have attributes and necessary features that cannot be replicated in a synthetic environment**

Change our Adversary Air enterprise to better replicate the threat

- **High End Training**
  - **Moving from less capable, less relevant adversary air**
  - **Standing up Fifth Gen aggressors**
- **Lower End Training**
  - **“Blocking and tackling” adversary air at scale**
- **The Advanced Tactical Trainer (ATT) Idea**
  - **A Tactical Surrogate: cheaper, more flexible, higher use rate**
  - **Priority for our lowest density, high end assets**
  - **Help with fighter pilot absorption, building of airmanship, etc**
  - **Can provide basic Adversary Air at low cost and ease of access**

The Future of Blended Training: A USAF View

- **We will not have a single, all-encompassing Training Venue or Event**

- **Everything is a Part-Task-Trainer**
  - **Synthetic Training: “reps and sets” in the most stressing, realistic conditions**
  - **Live Training: Airmanship, Integration, “Air under you”**
  - **Weapons System Trainers: specific training reqts**
  - **Low-Cost Simulators: Individual-paced learning, efficient, enhancing**
  - **We will not blend live and virtual “for its own sake”**

- **Virtual / Mixed Reality**
  - **Pilot training examples**
  - **Broad applications**

All Training is Oriented on the Needs of Airmen for the Fight of the Future


Airmen are our competitive advantage.