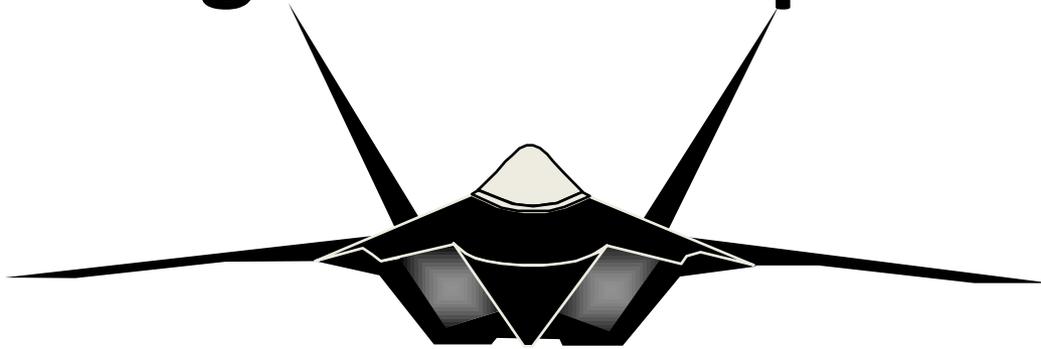




---

# Warfighter's Perspective



Train like we fight

1<sup>st</sup> Fighter Wing, Langley AFB, VA



# Overview

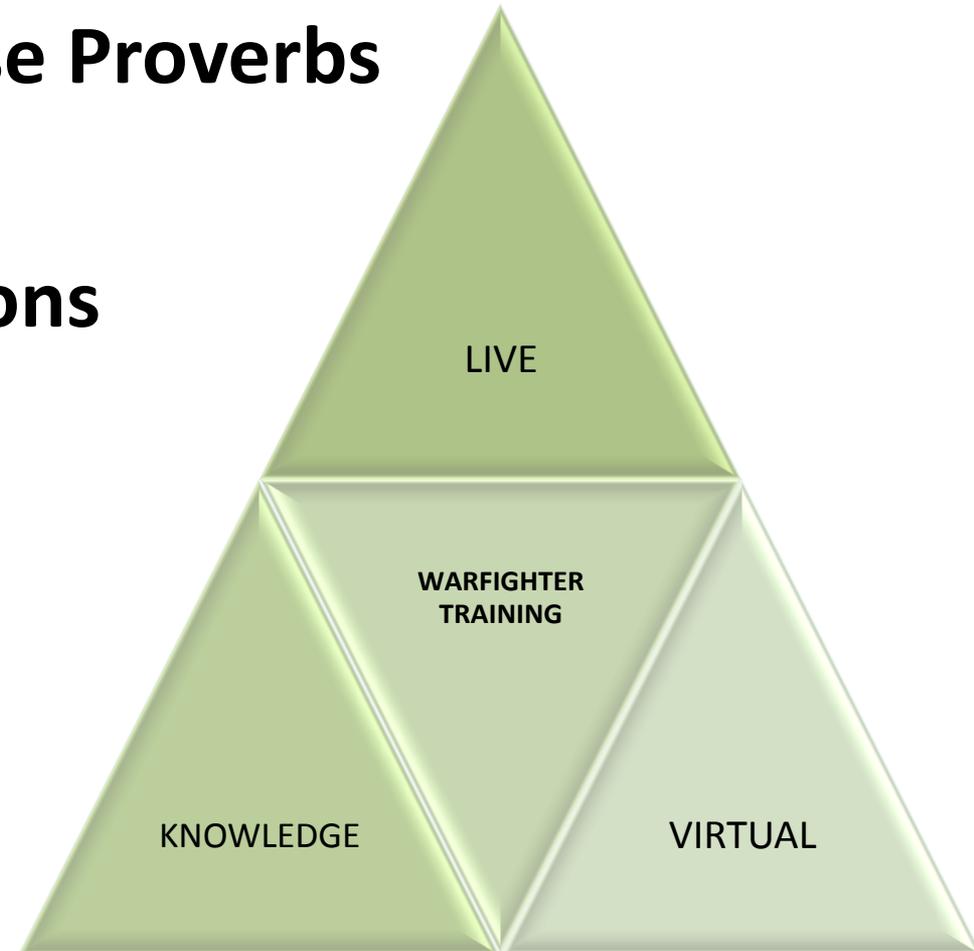
---

- **Importance to the Warfighter**
- **State of 5th Gen Simulation**
- **5th Gen Training Requirements**
- **Forward Thinking**



# Importance to the Warfighter

- **“The more you sweat in peace, the less you bleed in war”- Chinese Proverbs**
- **An equal partner...**
- **Live Training Limitations**
- **Value**
- **Safety**
- **Frequency**
- **Debrief Capability**





# State of 5<sup>th</sup> Gen



- **Strengths/Capabilities**

- Instrument/EP
- LFE/IADS
- EA training
- DMO w/F-15C,AWACs

- **Limitations**

- Limited DMO
  - No B-2, F-18, F-15E, F-16, F-35

- **Limitations**

- Visual Database
  - AORs (TY, FF, WA)
  - Visual Resolution
  - Visual Models
    - Wpns, Cons, Weather, SAMs
- System Stability
  - Execution
  - Debrief

- **Limitations**

- Threat Models
  - Independent Validation
  - Visual Detection
  - Wpns Flyouts
  - Documentation
- Limited Man-In-The-Loop (MITL)



# F-22 MTC Vision

---

- **A stable, representative, concurrent device to learn Systems, Emergencies, Instruments and Tactical skills**
- **Provide mission rehearsal level training...**
  - Anywhere in the world
  - In a near life like environment
  - Against Man in the Loop realistic, intel/test validated threats
  - With every other AF and Joint platform that we employ with
- **Debrief and evaluate proficiency with accuracy and efficiency**



# System & Training Requirements



## • Visual & Database Systems

- Full range of visual tasks (BFM-ACT)
  - Support VID, WVR maneuvering
- Hi-Fidelity terrain database
  - Enable Dynamic SAR mapping
  - Support A/G targeting and sorting with datalink & other aircraft
- Support realistic visual SAM launch, MSL flyout, AAA, Wpns Effects
- Realistic weather that supports instrument and tactical scenarios

## • Threat Modeling

- Independently Validated
  - NASIC/MSIC
- Pilot Level Design Document
- IOS Training Program
- Visual Detection Model
- Wpns Flyout Modeling
- Threat Countertactic Effectiveness
  - IAW 3-1, 422 Test Reports

## • MITL/DMO

- Aggressor flown A/A threats
- Aggressor Operated IADS elements
- Intel generated scenario integration
- Adjustable Missile Pk
- Adjustable EA
  - Comm, RDR, GPS, LINK
- DMO with all CAF assets

## • Concurrence/Stability

- Sim Software pre-dates A/C OFP release by 60Days
- 90% Reliability Rate
  - Re-starts, re-boots
  - Debrief displays stay in sync



# Forward Thinking

---

- **Live Virtual Constructive (LVC) integration**
- **Enhanced Debriefing Tools**
- **Combat Capability**



# Live Virtual Constructive

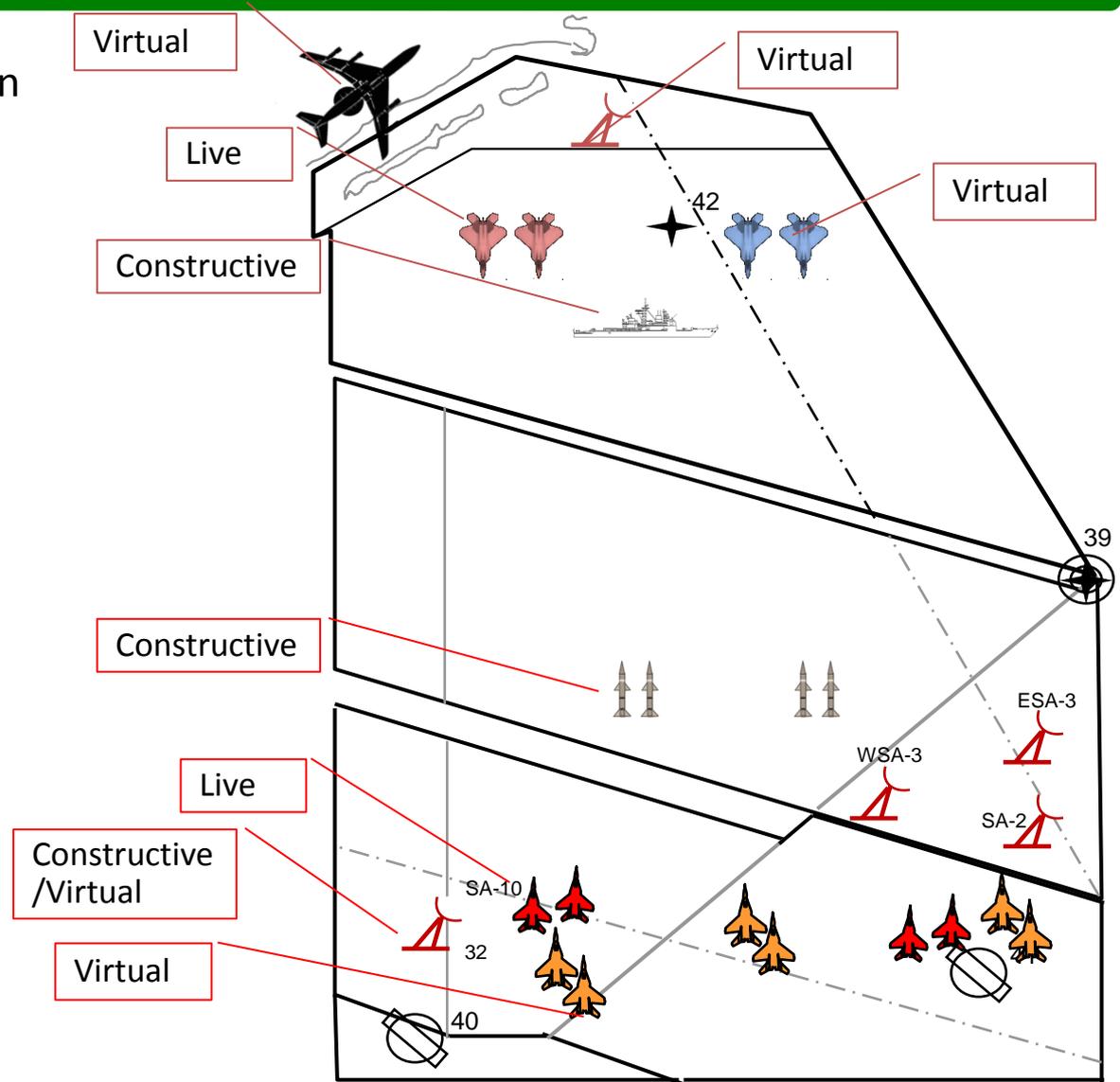
---

- **5<sup>th</sup> Gen needs integrated LVC training**
  - **Must fight out-numbered**
  - **Against sophisticated MITL threats**
  - **Real time kill/counter-tactic effectiveness**
  - **Leverage limited flying hours, range space, adversaries, composite force opportunities**
  - **Allow fine tuning of training intensity on the fly**



# LVC Scenario

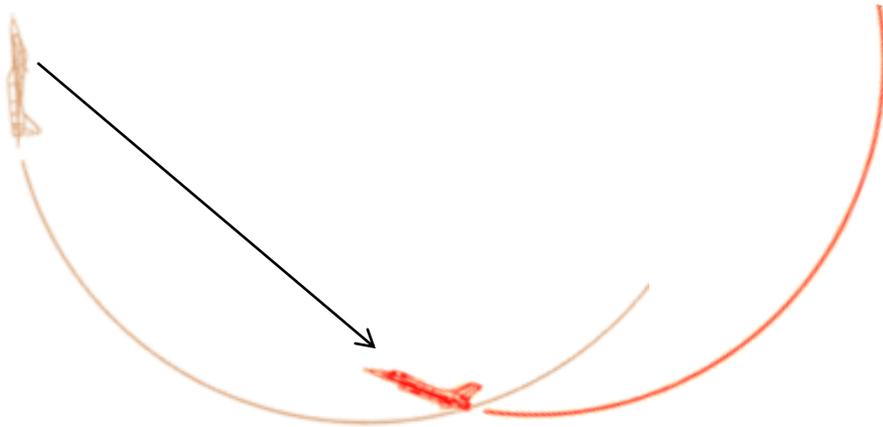
- Defensive Counter Air mission in Home Airspace
- Live 2v4
- Add Virtual/Constructive Entities
- 4v10 with Patriot, AWACS, AEGIS, Cruise missiles, IADS





# Enhanced Debriefing Tools

- **Reconstructive live flight debrief view**
  - Photo realistic aircraft animation with padlock view
  - Recreates what pilot saw in HD
  - Overcome limitation of HUD camera





# Enhanced Debriefing Tools

- **Sim eye tracker**
  - Tracks pilot's eyes and overlays on debrief displays
  - Enables instructor to assess cross-check





# Future of Simulation

- Transition a training medium into a combat capability

Multiple  
On/Off-  
Board  
Sensor  
Feeds



Virtual Reality  
Cockpit

Hi Bandwidth, Low  
Latency, Secure  
Datalink





# Summary

---

- **Importance to the Warfighter**
- **State of 5th Gen Simulation**
- **5th Gen Training Requirements**
- **Forward Thinking**



# Questions