505th Command & Control Wing

Gateway to Operational Level Command

Distributed Mission Operations
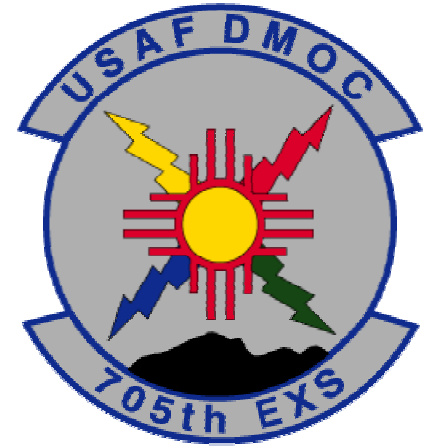
Lt Col Don "Drex" Drechsler

Commander

705th EXS, Kirtland AFB, NM

(USAF DMOC)

This Briefing is:
UNCLASSIFIED

- **Distributed Mission Operations**
- **Virtual Flag Overview & Lessons Learned**
- **Growing Role of DMO Exercises**
- **Other Roles of DMO**

Chain of Command

Air Combat Command
Gen Keys

USAF Warfare Center
Maj Gen Worden

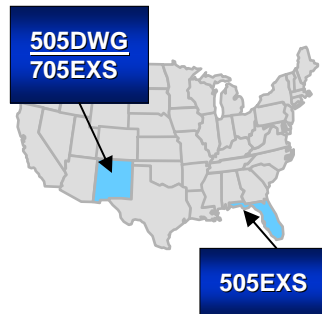505 CCW
Col DiFronzo

505 DWG
Col Moskal

505th Distributed Warfare Group

Kirtland AFB, NM

Mission

Provide high-fidelity theater synthetic battlespaces and world-class exercise control to support joint distributed warfighter training, testing and experimentation across the operational and tactical levels of war

505DWG
705EXS

505EXS

Key Programs

- **Distributed Mission Operation Center (DMOC)**
- **BLUE FLAG, VIRTUAL FLAG**
- **USAF Professional Control Force**

Gateway to Operational Level Command

Distributed Mission Operations

- ## DMO is a CSAF-directed readiness initiative

  - ### Train warfighters and build mission rehearsal capability

  - ### Tie C2 & ISR to the shooters

  - ### Mix/match <u>Live-Virtual-Constructive</u> to meet training objectives from tactical to operational levels

  - ### Link geographically separated simulation centers

  - ### Link across AF, Joint, & Coalition

- ## DMO is an <u>Integration, Training, and Testing Effort!</u>

  - ### Integrate existing, emerging programs, processes, technologies to evolve DMO Capabilities
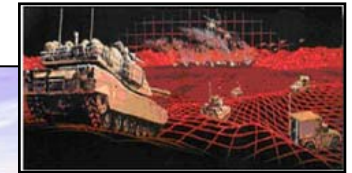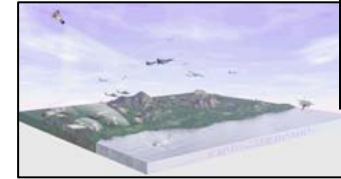
> **DMO Provides the Major Component of Training Transformation for the AF (CSAF, 7 Jan 03)**
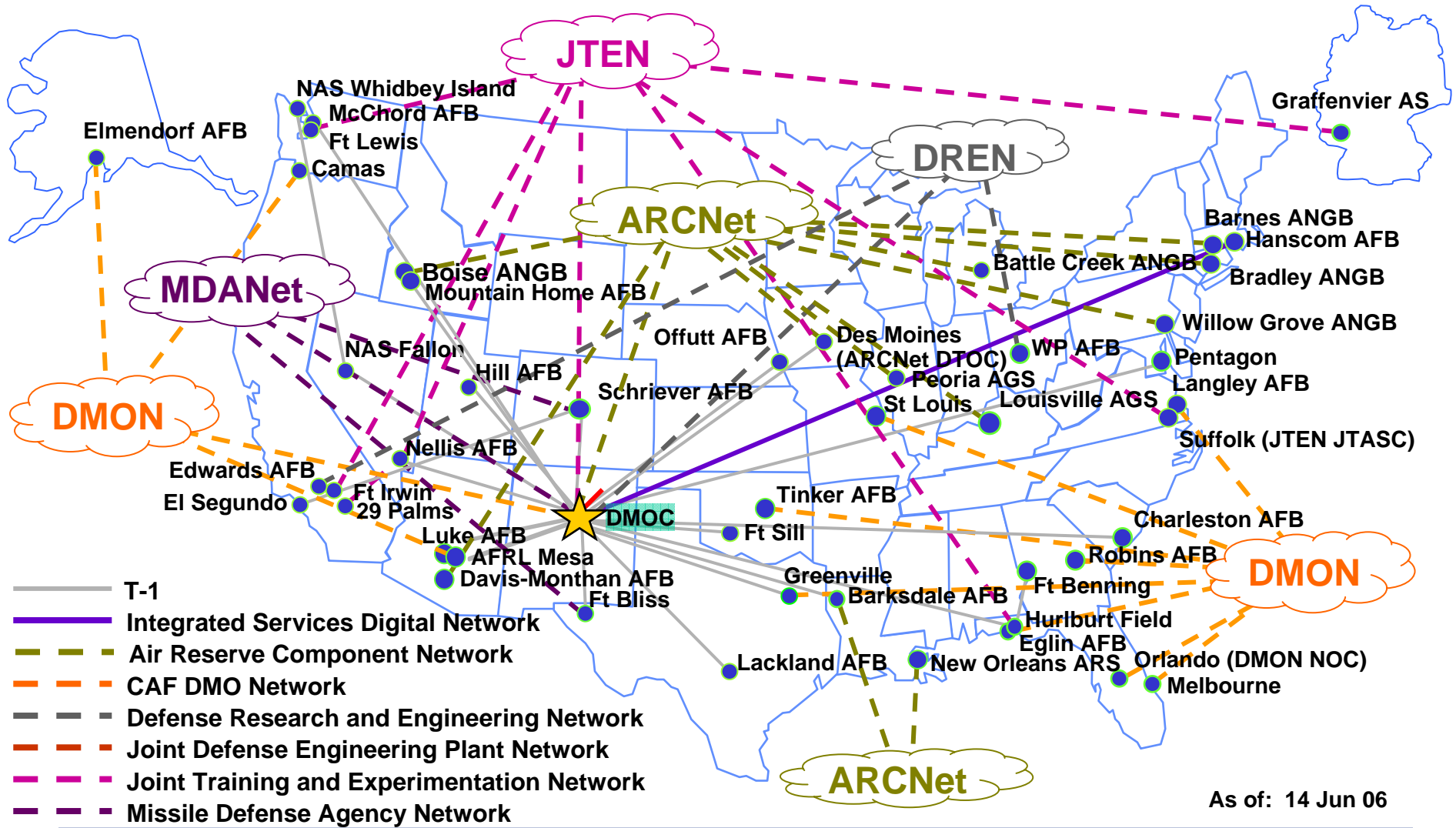
DMOC Simulators

- **F-15 C/E**
- **CRC**
- **J-STARS**
- **Cobra Ball**
- **AWACS**
- **Patriot / JSWS**
- **UAV**

- **Threat & Scenario Generators**
- **F-22**
- **F-16 RTC**

DMOC Accessible Networks

JTEN

Graffenvier AS

DREN

NAS Whidbey Island
McChord AFB
Ft Lewis
Camas

Elmendorf AFB

ARCNet

Barnes ANGB
Hanscom AFB
Battle Creek ANGB
Bradley ANGB

MDANet

Boise ANGB
Mountain Home AFB

Willow Grove ANGB

DMON

NAS Fallon

Hill AFB

Offutt AFB

Des Moines
(ARCNet DTOC)

WP AFB

Pentagon
Langley AFB

Schriever AFB

Peoria AGS

Louisville AGS

St Louis

Suffolk (JTEN JTASC)

Nellis AFB

Edwards AFB
El Segundo
Ft Irwin
29 Palms
Luke AFB

Tinker AFB

Charleston AFB

DMOC

Ft Sill

Robins AFB

DMON

AFRL Mesa
Davis-Monthan AFB
Ft Bliss

Greenville
Barksdale AFB

Ft Benning

Hurlburt Field
Eglin AFB

Lackland AFB

New Orleans ARS

Orlando (DMON NOC)
Melbourne

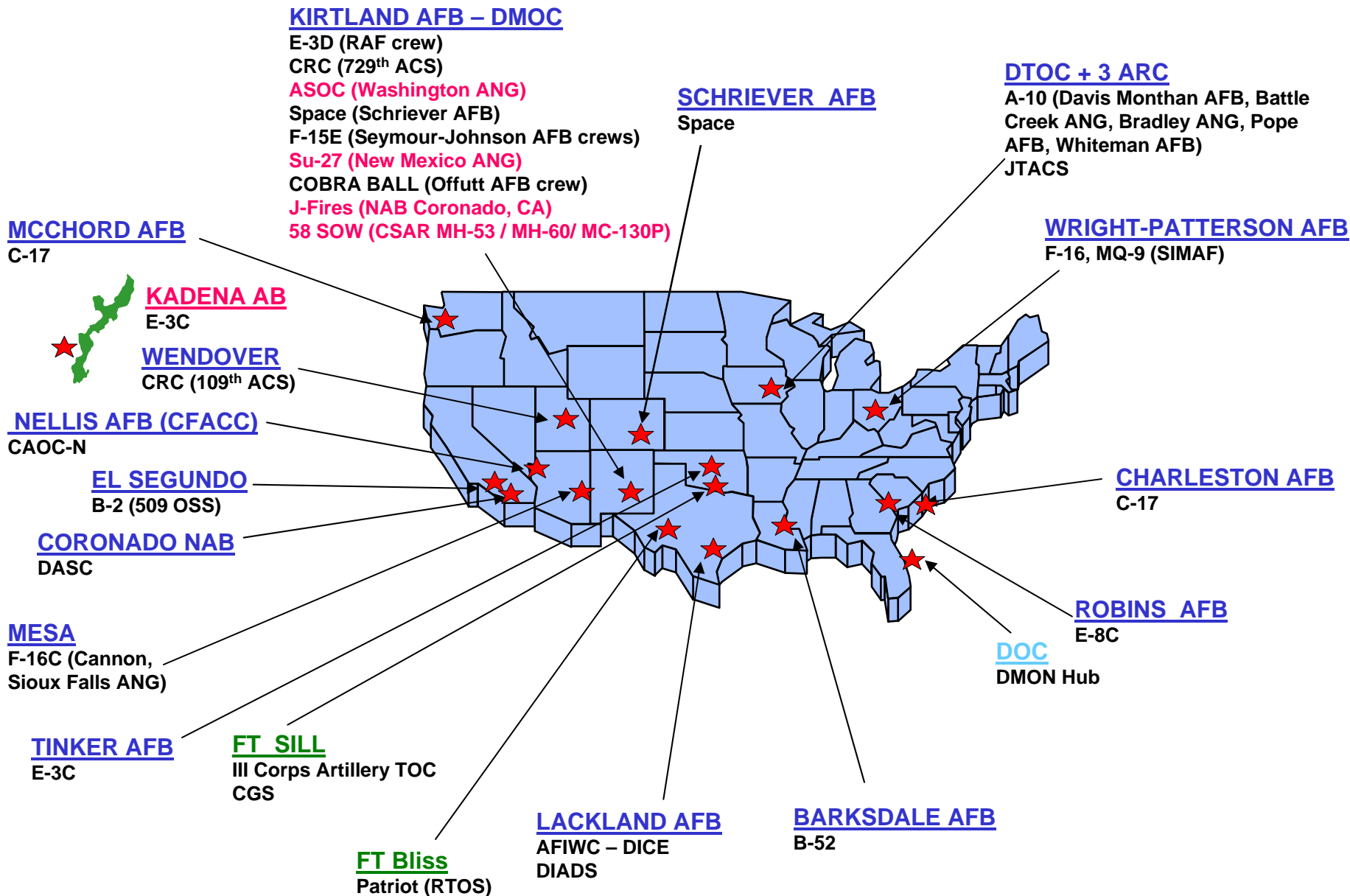|	
——————	T-1
——————	Integrated Services Digital Network
– – – – –	Air Reserve Component Network
– – – – –	CAF DMO Network
– – – – –	Defense Research and Engineering Network
– – – – –	Joint Defense Engineering Plant Network
– – – – –	Joint Training and Experimentation Network
– – – – –	Missile Defense Agency Network

ARCNet

As of: 14 Jun 06

Gateway to Operational Level Command

Exercise VIRTUAL FLAG

- **Large Force Combat Employment Exercise in a virtual battlespace**

- **Similar to Red Flag format, but "larger"**
  - **250 - 400 participants (20+ locations)**
  - **Warfighters participate from worldwide locations**
  - **Requirements: Simulator + network + DMO capability**

- **2 week exercise period**
  - **1 week – academics & integration testing (decreasing requirement)**
  - **1 week – execution (Fam Day + four days of 3-4 hr vul period/day)**

- **Scenarios → AEF Preparation**
  - **Range space is virtually unlimited**
  - **Theater-specific mission planning documentation (SPINS, ATOs, ROE)**
  - **Real world threat presentations (A/A, A/G, IO)**

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Typical Virtual Flag

KIRTLAND AFB – DMOC
E-3D (RAF crew)
CRC (729th ACS)
ASOC (Washington ANG)
Space (Schriever AFB)
F-15E (Seymour-Johnson AFB crews)
Su-27 (New Mexico ANG)
COBRA BALL (Offutt AFB crew)
J-Fires (NAB Coronado, CA)
58 SOW (CSAR MH-53 / MH-60/ MC-130P)

SCHRIEVER AFB
Space

DTOC + 3 ARC
A-10 (Davis Monthan AFB, Battle Creek ANG, Bradley ANG, Pope AFB, Whiteman AFB)
JTACS

MCCHORD AFB
C-17

KADENA AB
E-3C

WRIGHT-PATTERSON AFB
F-16, MQ-9 (SIMAF)

WENDOVER
CRC (109th ACS)

NELLIS AFB (CFACC)
CAOC-N

EL SEGUNDO
B-2 (509 OSS)

CHARLESTON AFB
C-17

CORONADO NAB
DASC

MESA
F-16C (Cannon, Sioux Falls ANG)

ROBINS AFB
E-8C

DOC
DMON Hub

TINKER AFB
E-3C

FT SILL
III Corps Artillery TOC
CGS

FT Bliss
Patriot (RTOS)

LACKLAND AFB
AFIWC – DICE
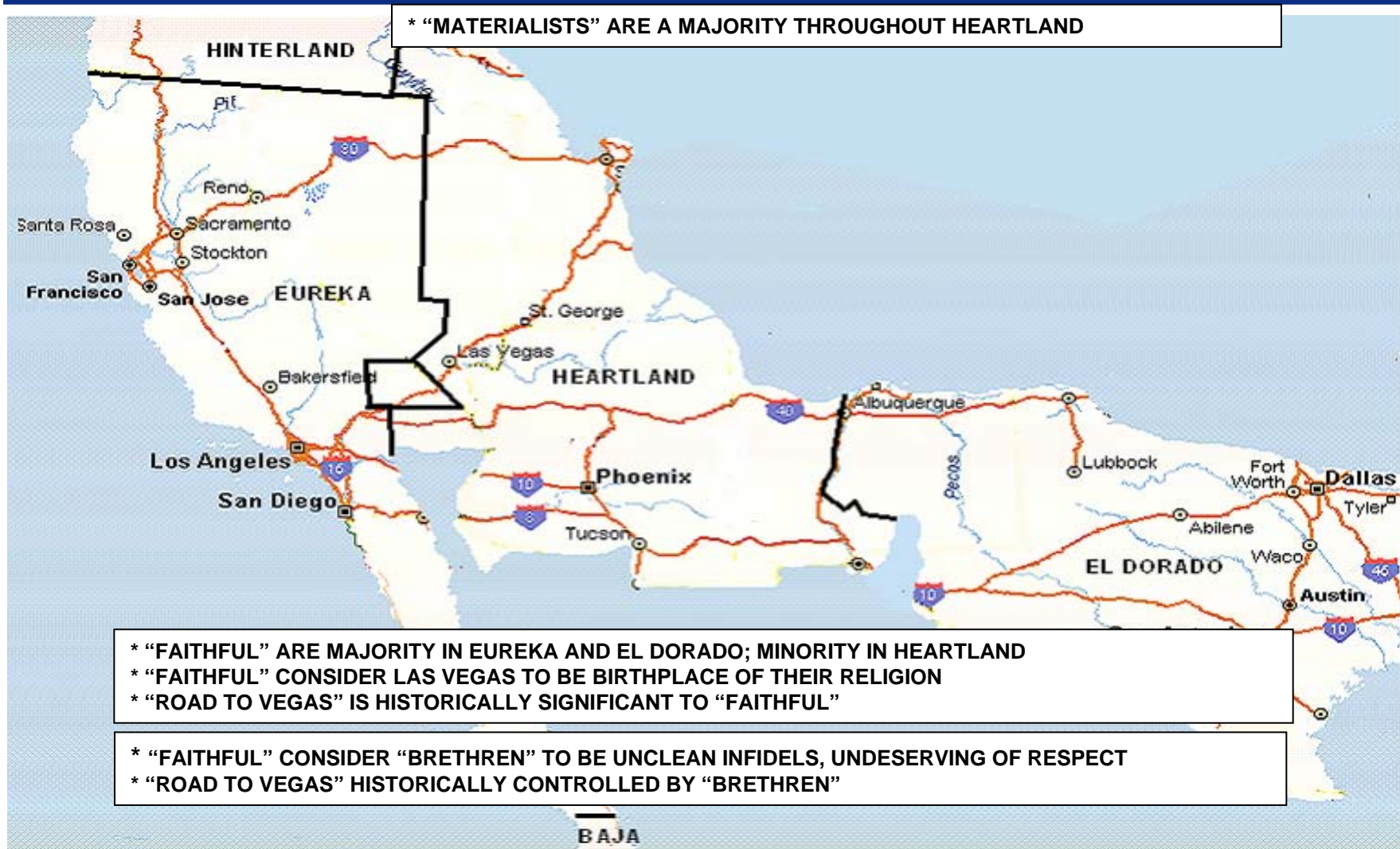DIADS

BARKSDALE AFB
B-52

Typical VF Academics

- **2 days of Academics (at Kirtland and via VTC)**

- **MWS Capabilities/Limitations**
  - **Sim difference training**
  - **Includes CAOC & Operational-level of War training**

- **CSAR**
  - **TTPs and PRC-112 operations**

- **Package Commander Duties and Responsibilities**

- **Dynamic Targeting (DT)**
  - **Roles and responsibilities of each MWS**

SOUTHWEST USA SCENARIO

* "MATERIALISTS" ARE A MAJORITY THROUGHOUT HEARTLAND

HINTERLAND

Pit

Reno

Santa Rosa

Sacramento

Stockton

San Francisco

San Jose

EUREKA

St. George

Las Vegas

HEARTLAND

Bakersfield

Albuquerque

Los Angeles

Lubbock

Fort Worth

Dallas

Phoenix

San Diego

Pecos

Tyler

Tucson

Abilene

Waco

EL DORADO

Austin

* "FAITHFUL" ARE MAJORITY IN EUREKA AND EL DORADO; MINORITY IN HEARTLAND
* "FAITHFUL" CONSIDER LAS VEGAS TO BE BIRTHPLACE OF THEIR RELIGION
* "ROAD TO VEGAS" IS HISTORICALLY SIGNIFICANT TO "FAITHFUL"

* "FAITHFUL" CONSIDER "BRETHREN" TO BE UNCLEAN INFIDELS, UNDESERVING OF RESPECT
* "ROAD TO VEGAS" HISTORICALLY CONTROLLED BY "BRETHREN"

BAJA

Gateway to Operational Level Command

Virtual FLAG 06-3

- **SW USA Scenario**

- **New Capabilities**

  - **J-Fires**

    - Real-time coordination for Joint Kill Box procedures

  - **Digital CAS Interface**

    - Machine to machine interface – ASOC to JTAC tasking/reporting via TACP CAS Software

  - **DMOC Su-27**

    - First time configuration of F-16 simulator as Su-27

  - **Aggressors (Nellis)**

    - Beginning linkages with Red Flag Aggressor squadron

Virtual FLAG 06-4

- **SW USA Scenario**

- **New Capabilities**

  - **Red Tactical Voice**

    - Joint EP-3/RIVET JOINT capability to simulate tactical Red Air

  - **Minot B-52**

    - First time for integration and participation for this facility. Fly in formation w/Barksdale (2-ship).

  - **Dyess B-1**

    - First time run of B-1 from new DMO-equipped facility at Dyess

  - **IFACT Helmet-Mounted Sight**

    - Pre-cursor to JTACS-dome – first test within VF of helmet-mounted 360° view

  - **AFRL/Mesa** – Tested a new network (DMO) monitoring tool

VF 6-4 Numbers

- **People Trained: 356 Total**
  - **USAF: 207**
  - **USA: 104**
  - **USN/USMC: 18**
  - **RAF: 27**

- **DMOC Sorties Flown: 33 (162 hrs, 93 participants)**

- **Distributed Sorties Flown: 88 (446 hrs, 263 participants)**

VIRTUAL FLAG 06-4 Results

- **B-1 participated from home station (Dyess AFB) for the first time**

- **C-17s successfully integrated**

- **Navy <u>E-2C</u> returned, four crews trained – <u>logged NAVY RAP reqs</u>**

- **Tactical Red Voice-emulator tested successfully for aircrew training**

- **<u>E-3C / E-8C / B-1 / B-52 logged RAP reqs</u>**

- **B-52 USAFWS Upgrade Mission Commander training**

- **ADAFCO / USAF JICO identified discrepancies in LINK mgmt**

  - **False positive EIDs of Blue Air tracks**

- **CAOC Operations floor integrated and trained via CAOC-N**
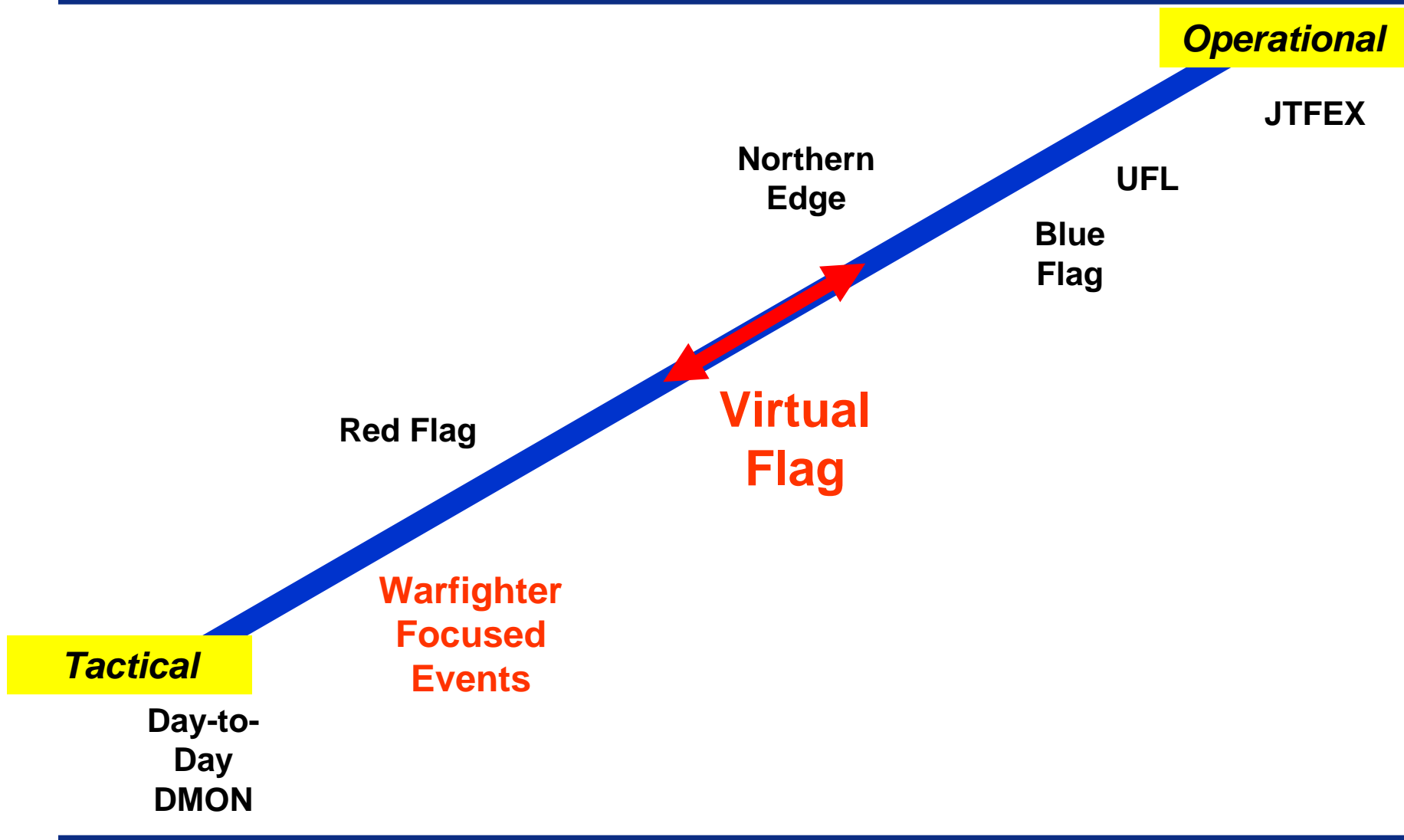
VIRTUAL FLAG Lessons Learned

- **Training is valuable even with low-fidelity sims**
  - **Integrate high to low fidelity sims . . . Tactical Training!**
  - **Exercise the entire Theater Air Control System**

- **Integrating Operational and Tactical level (AEF)**
  - **Great training for CAOC and tactical level participants**
  - **More needs to be done - common databases & EGs**

- **Still many technical hurdles to overcome in integration**
  - **Low & high fidelity sims - lack of DMO standards**
  - **No such thing as "plug and play" . . . not yet**
  - **Need a Maytag, DMO-experts, and professional WF**

DMO Training Spectrum

Operational

JTFEX

UFL

Northern
Edge

Blue
Flag

**Virtual
Flag**

Red Flag

**Warfighter
Focused
Events**

Tactical

Day-to-
Day
DMON

Gateway to Operational Level Command

Warfighter Focused Events (WFEs)

- **Training focused tactical warfighter**
  - **Focused on a specific task/event**
- **10-25 Participants (5-7 Weapon Sys), <u>small</u> White Force**
- **Build "On-the-shelf" training missions**
  - **Can be varied – dial up/down intensity/constructives**
- **Frequency: Eventually weekly**

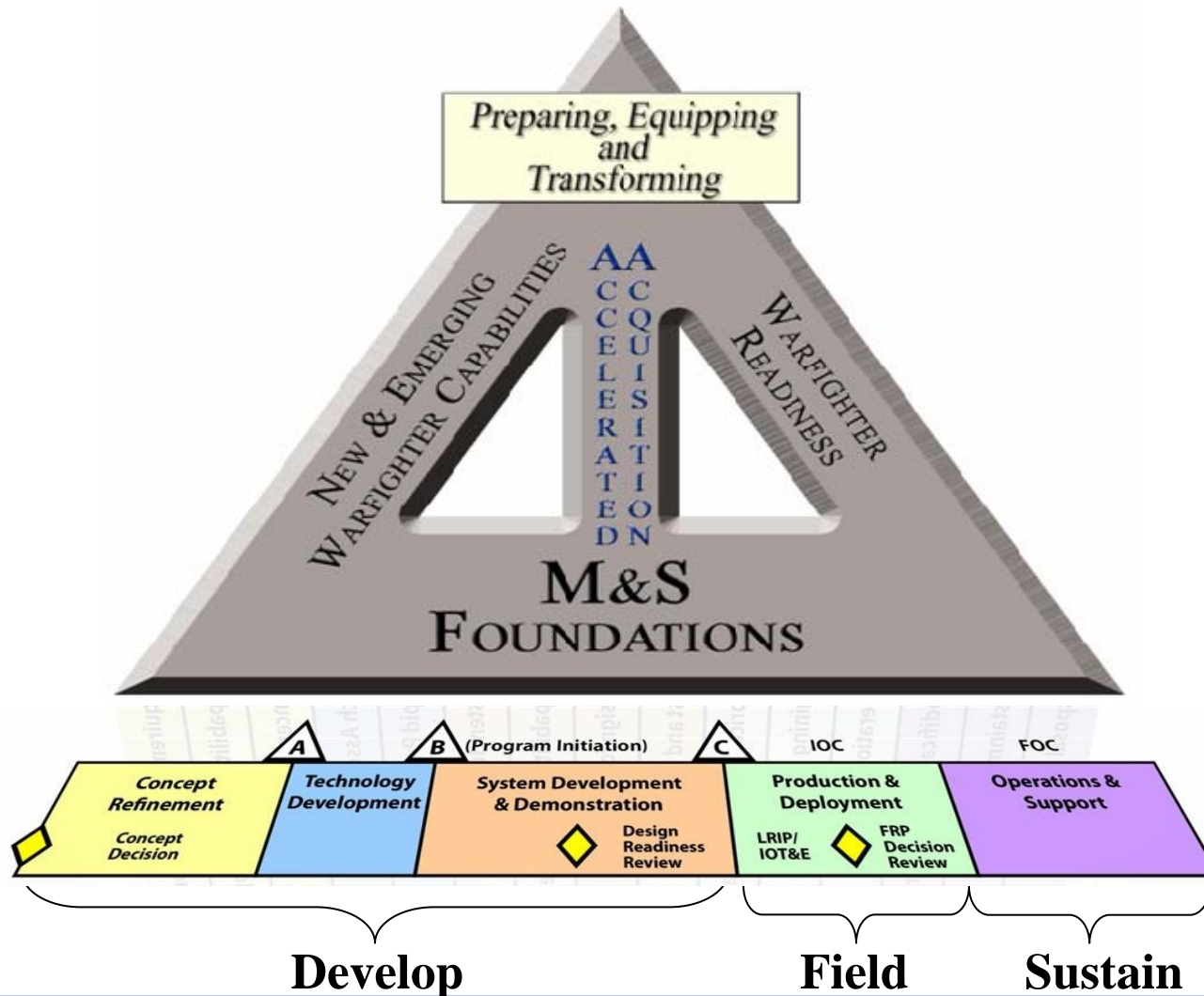|			
■CSAR	■CAS	■DCA-Patriot	■SOF
■XINT	■TST/DT	■Airfield Assault	■IADS takedown
■SEAD/DEAD	■Pipeline Protect	■Urban CAS	■DCA (J-kill chain)
■OCA	■NEO	■WMD Strike	■Others . . .

On the horizon . . .

- **Longer Term Virtual Flag development**
  - **MCO**
  - **AEF / GWOT**
  - **HLD**
  - **Rapid Mission Rehearsal**

- **Many Longer Term Pieces (Missing)**
  - **Databases (for at least five potentially hot areas)**
  - **Scenario Generation, EGs, IO, EW, etc.**
  - **Training Requirements**

- **LVC Integration**
  - **Incorporating Virtual/Constructive into Red Flag (Live)**
  - **Incorporative Live into Virtual Flag**

Air Force M&S Thrust Areas

Develop   **Field**   **Sustain**

Gateway to Operational Level Command

DMO Test Event (IAMD) Execution

- **IAMD: Distributed exercise consisting of 4 sites**
  - **Distributed Mission Operations Center (DMOC)**
  - **Virtual Warfare Center (VWC)**
  - **Joint National Integration Center (JNIC)**
  - **Elmendorf AFB, AK**

- **<u>Scenario</u>: Persian Gulf (missile launch)**
  - **Ten vignettes**
    - **Increasing in type and intensity of threats**
  - **Final vignette consisted of multitude TBMs, cruise missiles, and aircraft threats**
    - **Prioritizing the threats was the emphasis on this vignette**

DMO Test Event (J-Fires)

- **Joint Fires Coordination Measure (JFCM)**

  - **Tested pre-developed procedures to replace existing joint kill box operations**

  - **Test conducted during VF 06-3 (June 2006)**

  - **Highly successful event**
    - **100% of data capture requirements**
    - **Multitude of joint major weapon systems**

  - **Follow-on event will be tested in a "real world" theater**

Joint Kill Chain Event (JKCE)

- **JNTC funded: Provide training in a Joint Environment**

- **Grew out of Lessons Learned from OIF**

- **Goal: Minimize fratricide incidents**
  - **Coordinate air tracks to ensure PATRIOT missiles are targeting the correct entities**

- **Air Force CRC, Army ADAFCOs, and PATRIOT units**

Advanced Concepts

- **Joint Air/Ground Operations: Unified, Adaptive Replanning (DARPA)**
  - Dynamic semi automated ATO generation
  - Testbed for CONOPS development

- **Airborne Laser (ABL SPO)**
  - Prototype Tactical and Weapon Displays (Warfighter in the loop)
  - TADIL-J capability

- **F-16 High Energy Laser Fighter (AFRL)**
  - Tactical laser
  - Evaluate design parameters and utility

- **Advanced Concepts Event (AFRL)**
  - CONOPS development
  - Mission tactics, C2
  - Survivability/lethality of advanced systems

Few thoughts to leave you with . . .

- DMO brings realistic training unavailable except in combat

  - Real world scenario & full-array of threats

  - Size of the training range is virtually unlimited

- Early integration and testing of new technology and TTPs

- DMO brings training w/lower costs

  - Aging airframes, rising flying hour costs

- Integrate tactical through operation level of combat

- Challenges:

  - Expand number of USAF, Joint, Coalition, external (DMO Campus)

  - Brief / Debrief tools in the distributed environment

  - Change in aviator culture (understood by younger generation)

Preparing the Warfighter for Combat in Joint & Coalition Environment

MISSION REHEARSAL

INTEGRATION

SCHEDULING

DISTRIBUTED

TRAIN

MISSION

EXPERIMENT

OPERATIONS

SCENARIOS

REPOSITORY

TEST

RANGE INTEGRATION

DECISION SUPPORT

Virtual Flag Dates

- **VF 7-1**
  - **30 Oct – 2 Nov 06**

- **VF 7-2**
  - **19-22 Mar 07**

- **WFEs**
  - **Beginning NLT Apr 07**

- **VF 7-4**
  - **16-20 Jul**

VF 6-4 PARTICIPANT LOCATIONS

KIRTLAND AFB – DMOC
E-3D (RAF crew)
CRC (729th ACS)
ASOC (Washington ANG)
Space (Schriever AFB)
F-15C (Tyndall AFB crews)
Su-27 (New Mexico ANG)
COBRA BALL (Offutt AFB crew)
JTACS (Ft Stewart, GA)

SCHRIEVER AFB
Space

MINOT AFB
B-52

DTOC + 3 ARC
A-10 (Davis Monthan AFB, Battle Creek ANG, Bradley ANG)
JTACS (Ft Stewart, GA)

NAS WHIDBEY ISLAND
EP-3

MCCHORD AFB
C-17

NELLIS AFB (CFACC)
CAOC-N

DAM NECK,VA
E-2C

CHARLESTON AFB
C-17

TINKER AFB
E-3C

FT SILL
III Corps Artillery
CGS

FT BLISS
Patriot (RTOS)

DYESS AFB
B-1

LACKLAND AFB
AFIWC – DICE
DIADS

BARKSDALE AFB
B-52

ROBINS AFB
E-8C

DOC
DMON Hub