Unclassified

NAVAIR

Air Combat Environment Test & Evaluation Facility

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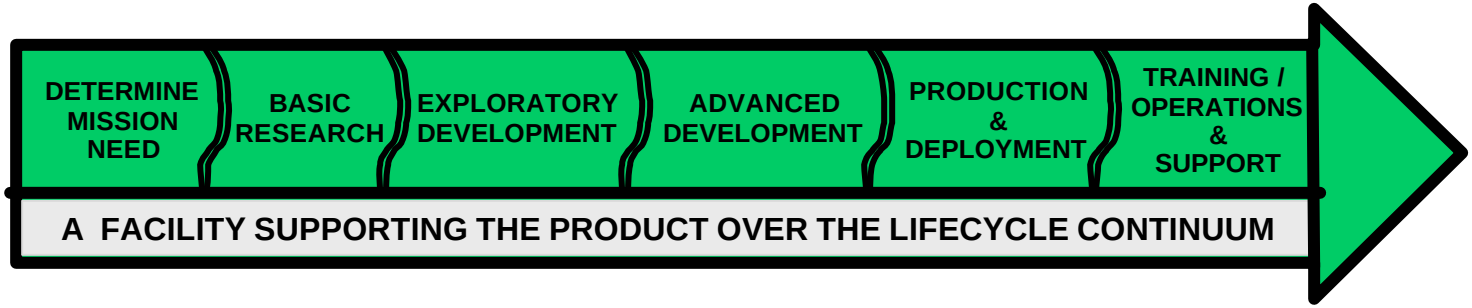
ACETEF Mission

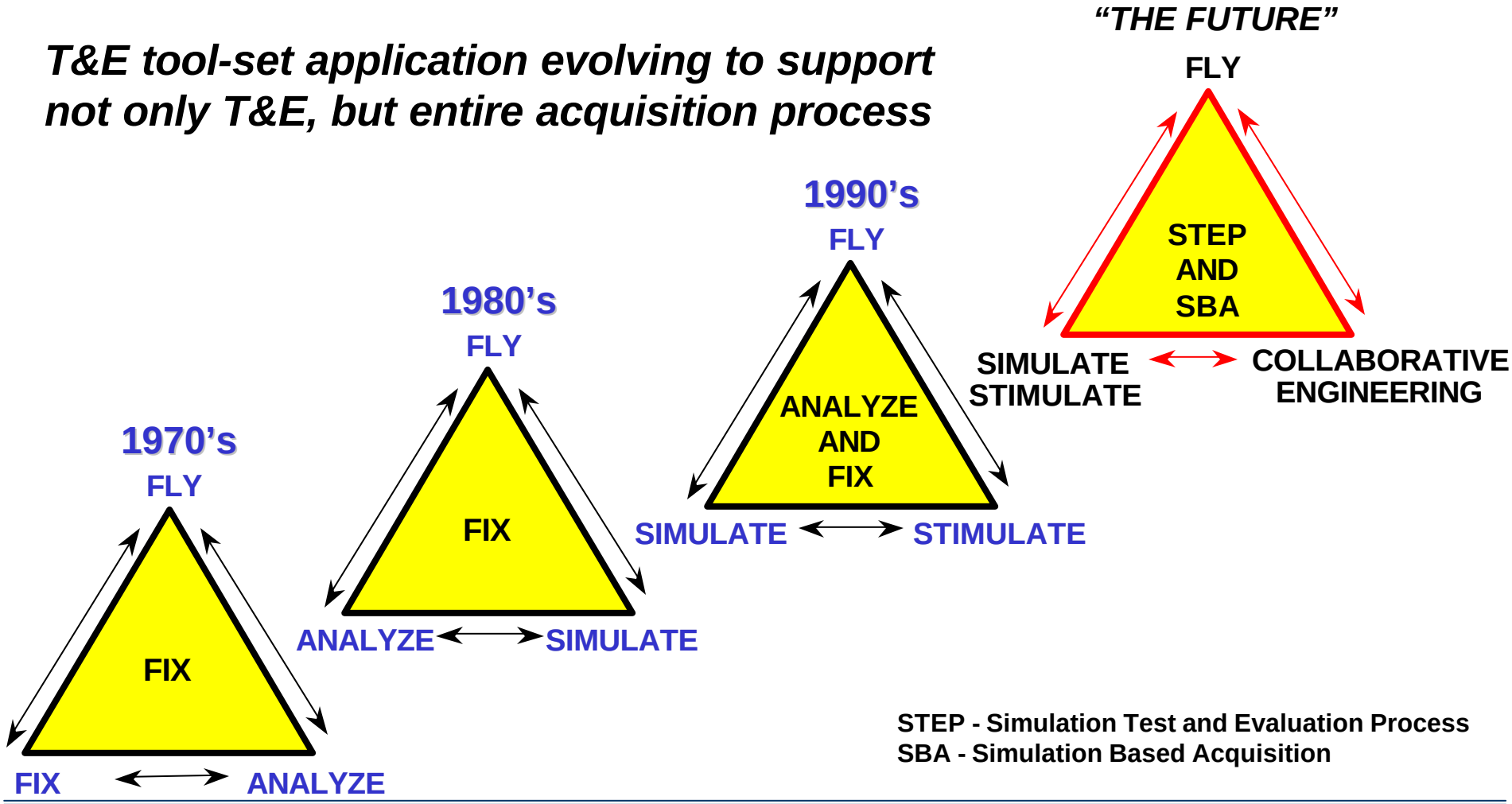
ACETEF's primary mission is to reduce technical risk and cost for Navy aircraft and aircraft systems through the use of simulation and stimulation during installed systems testing. The facility provides a multitude of resources and capabilities which are used for Research, Development, Test and Evaluation (RDT&E) and Training in support of the systems development process and systems deployment.



Providing a capability which makes comprehensive Acquisition, RDT&E and Training more affordable

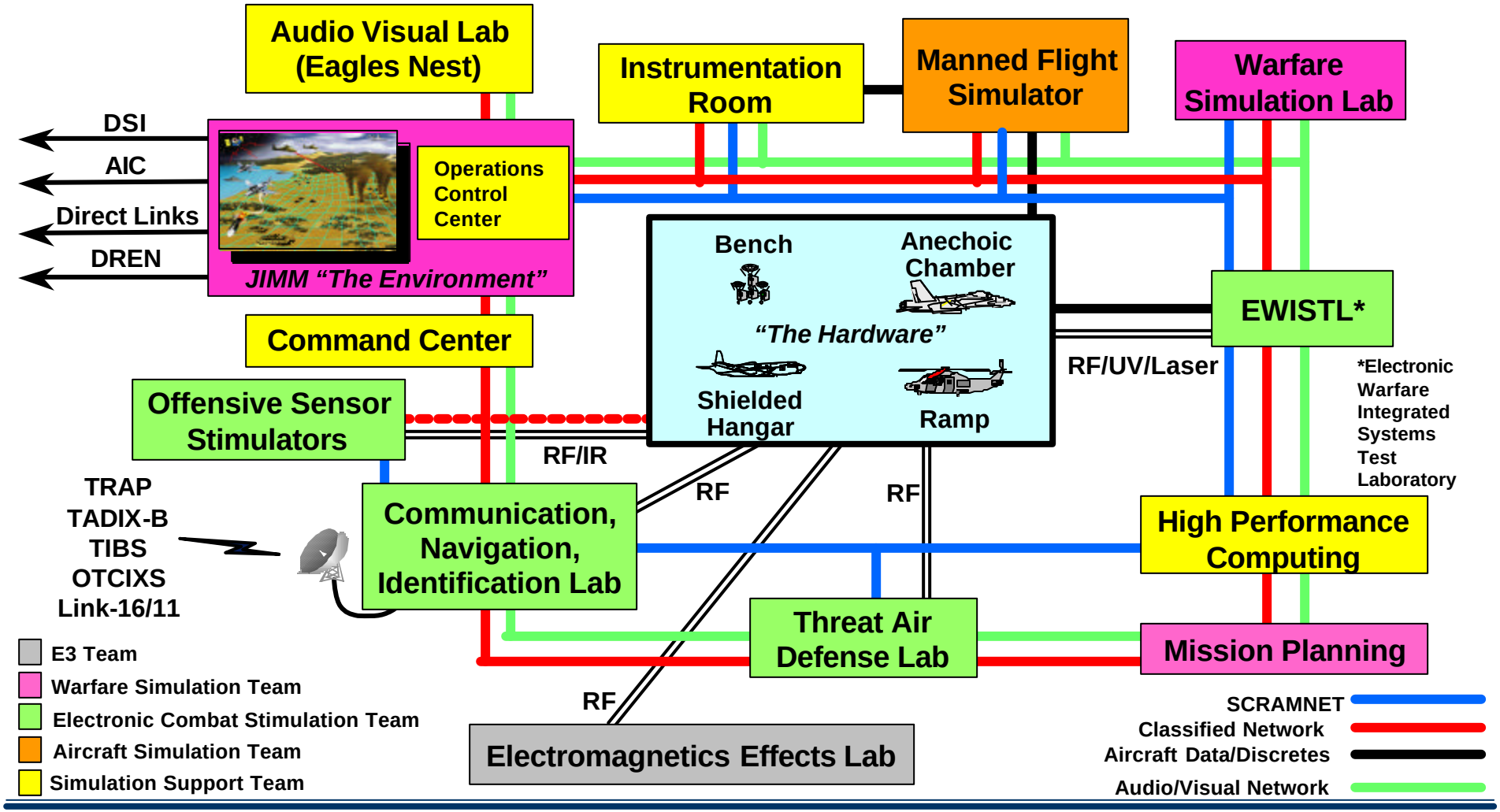
T&E "Tool-Set" Evolution

T&E tool-set application evolving to support not only T&E, but entire acquisition process



STEP - Simulation Test and Evaluation Process
SBA - Simulation Based Acquisition

ACETEF ARCHITECTURE



Manned Flight Simulator

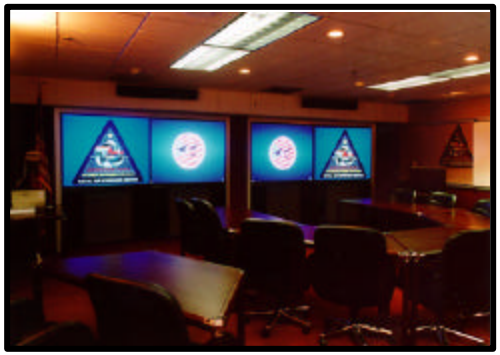
- High Fidelity Test Stations
  - Four M2DART Simulation Stations
  - 6 DOF Motion Platform
  - Wide FOV simulation stations
- Multiple High Fidelity Image Generation Systems

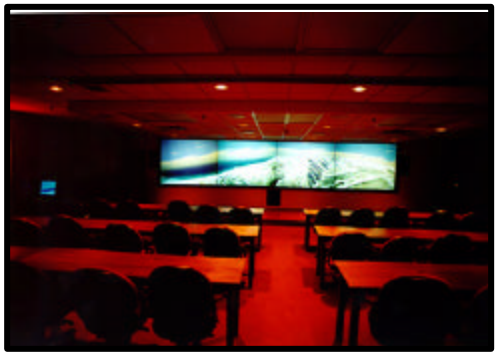
F/A-18 in Dome

V-22 in Motion Bay

- High Fidelity Cockpits
  - F/A-18 C/D
  - V-22 EMD
  - F-14 D
  - F/A-18 E/F
  - V-22 Prod
  - AH-1W
- Hardware-in-the Loop
  - Flight Control Computer Systems
  - Mission Computers
  - Multi-Function Displays

Operations & Control





Operations and Control Center

- Test Command and Control
- Test Visualization
- Facility Instrumentation
  - Loral 550 Front Ends and Alpha Workstations
- Internal/External Links
  - External: DSI, DREN, AIC, Direct Links
  - Internal: Shared Memory, Switched Ethernet/FDDI, Audio, Video
- Facility Video
- Facility Intercom
- Master GPS Time Source

High Performance Computing



HPC Capacity

- Multiple Onyx2 and Onyx3 Computers
- ~180 GFLOPS
- 214 CPUs, 25 Infinite Reality Engines
- 77GB Main Memory
- 5 TeraBytes of Disk Space
- 130 TB Tape Archiver
- NAWC-AD Secure Network
- Defense Research & Engineering Network

Typical Applications

- Multispectral scene generation
- Mission Environment Generation
- Signal/Image Processing
- Computational Fluid Dynamics
- Computational Electromagnetics
- Force Modeling

Warfare Simulation Lab

Mini-Crewstations

- Manned Virtual Stations
  - SGI OTW Image Generation
  - Four Heads Up/Down Stations
  - Ten Heads Up Stations
  - Generic Platform & System Models
    - Attack / Sensors / C2 / Weapons/ Aero / Controls

- Mission Planning and Rehearsal
  - JMCIS / TAMPS
  - AFMSS / CIS
  - CLOAR
  - TOPSCENE / Powerscene

Comm, Nav, Ident Lab

Communications Environment Simulator (CES)

GPS & Aux Nav Simulator

Strategic Data Link Simulator (SDLS)

- Communications Environment Simulator
  - Phase and Amplitude Distribution Ports
  - Number of Simultaneous Emitters: 64 High Fidelity, 128 Background
  - RF Coverage: 500 kHz to 18 Ghz
- Strategic Data Link Simulator (SDLS)
  - OTCIXS/TRAP/TIBS/TADIXS-B
- Data Link Simulator - MLST3
  - Link 4A/Link 11/Link 16 (Link 16 Gateway)
  - LDDS-11 - DTSS-11 (2)
    - Provides Land-line Link-11 (5 site)
- GPS & Aux Nav Simulator
  - 20 Satellite Constellation at RF
    - C/A, P & Y Codes (L1 and L2 Frequencies)
  - Selective Availability/Anti-Spoofing
- Airborne IFF Test System (AITS)

Electronic Warfare Integrated Systems Test Laboratory

Remote Antenna Positioning System (RAPS)

Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

Electronic Warfare Integrated Systems Test Laboratory

- ATEWES
  - Phase and Amplitude Distribution Ports
    - 2 Quad - 8 Element Phase AOA
    - 8 Element Amplitude AOA
  - Number of Simultaneous Emitters: 1024
  - Max Number of Platforms: 255
  - Pulse Density: 1Mpps @2% Drop, 4Mpps Max
  - RF Coverage: 0.05-18.0 GHz, 32.0-40.0 GHz
  - Emitter Library Modes: 7000
- Remote Antenna Positioning System (RAPS)
  - Two Moving Targets in Two Dimensions
  - Mounts Controllable in Azimuth, Elevation and Pointing Angle
  - Supports RF, EO, and IR Sources
  - Provides 10’ x 10’ FOV
  - Max Slew Rate: 50 Inches/Sec

Offensive Sensors

F-14 Tomcat RTS Testing

RTS Display

Radar Target Simulator (RTS)

Infrared Sensor Stimulator (IRSS)

Threat Air Defense Lab

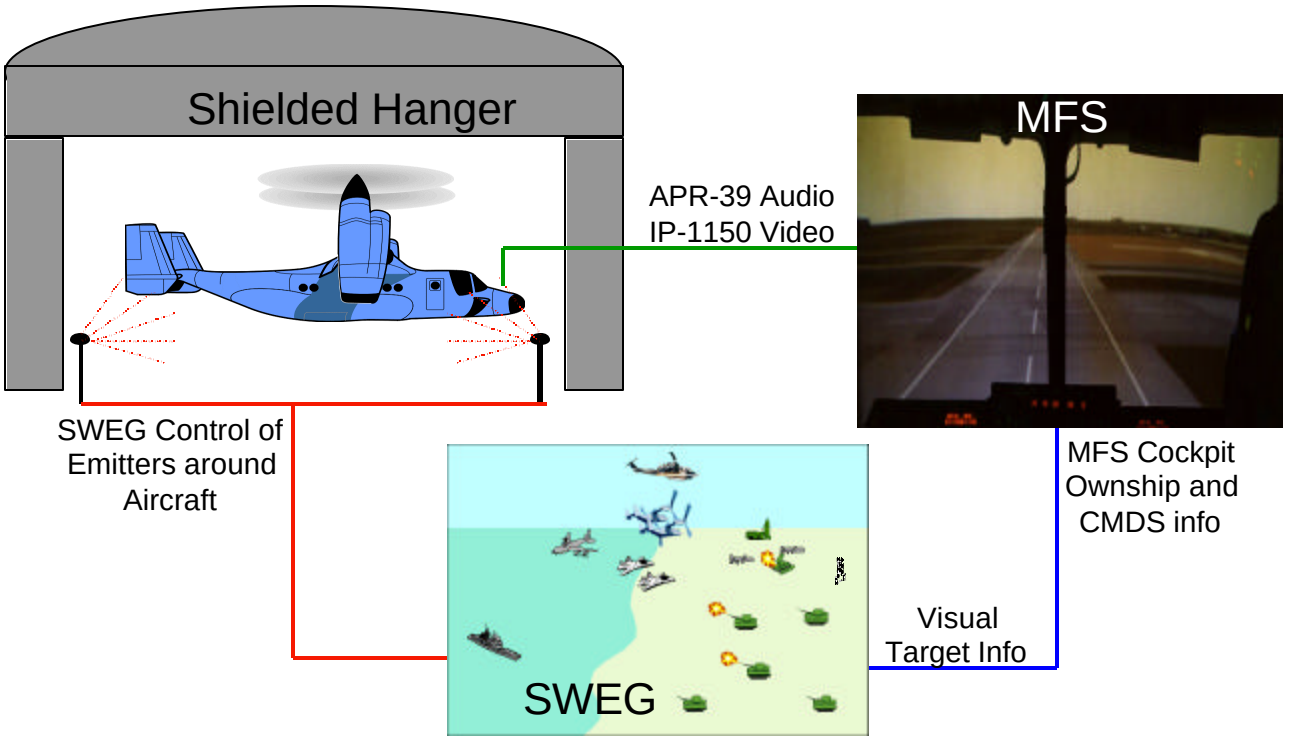
TADL Displays

- SAM Simulation System (I-23)
  - Frequency Range: X-Band
  - Closed Loop Threat Systems
  - Man-in-the-Loop
  - Seeker-in-the-Loop
  - Open Air Range Correlated Equipment
  - Validated Radar and Missile Flyout Model
- EW Acquisition System (EW ACQ)
  - Frequency Range: 800Mhz - 3Ghz Closed Loop Early Warning Radars
  - Man-in-the-Loop
  - Simulates up to 3 RED Systems
  - Provides Handoff to I-23
  - Low Band Threats IOC FY98

Shielded Hangar/ Anechoic Chamber

- Anechoic Chambers provide RF pure environments for Electromagnetic Environmental Effects Testing of components and complete systems
- Secure environments
- Have supported air platforms, weapon systems, ground vehicles and satellites
- Large Chamber Projects since ribbon cutting - S-3B, F/A-18, AH-1W, E-2C, F/A-18E/F

ACETEF Support to OT&E



Rigorous Accreditation Effort
- **COTF**
- **Lessons Learned with ALR-67**
- **TEAM effort w/OTD & ITT**

Initial Trial during OT-IID

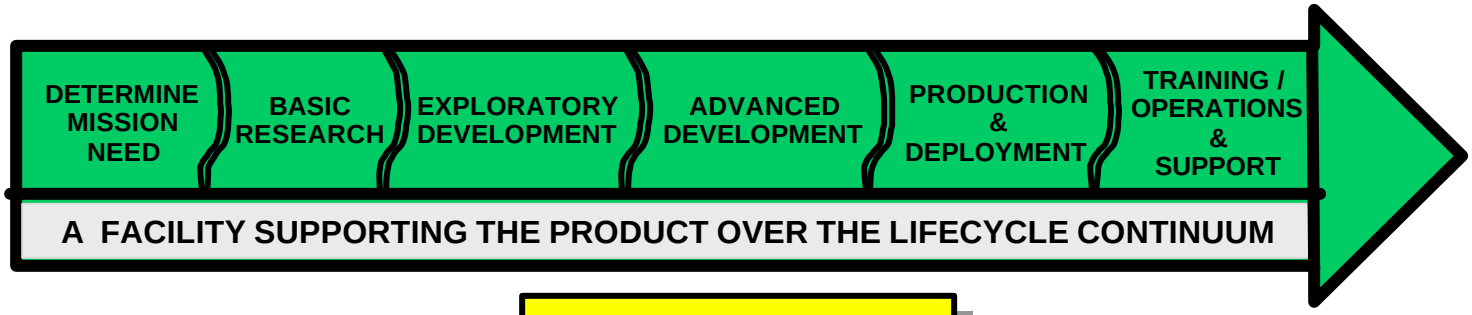
Currently executing OT-IIE
- **Completed first phase**
- **others scheduled CY-00**

Highly realistic TRAP Mission
- **Extensive re-use of JSF work**
- **Scenarios, data bases**
- **Tri-service validation efforts**

Multi-Sensor Stimulation
- **APR-39**
- **AAR-47**
- **AVR-2**
- **FLIR (Simulated)**

Provides scenarios and threat density un-available in the US.

T&E "building blocks" applied beyond "traditional" T&E



Y2K Testing

Joint Strike Fighter
Virtual Strike Warfare Environment Exercises
Force Process Team Exercises

Joint Combat Search and Rescue
Evaluate Multi-Service CSAR doctrine and numerous interoperability issues. AVTB (Ft. Rucker), TACCSF (Kirtland AFB), MCAS Miramar, ACETEF

F-14D
Digital Flight Control System

Joint Theater Missile Defense
Command and control evaluation to search out and destroy enemy surface launchers. ACETEF, RESA (San Diego), TACCSF, DS&ABL (Ft. Sill, OK)

EA-6B, F/A-18
EW Systems Testing

EP-3, P-3, E-2C
TDL, SDLS, GPS simulation and stimulation

V-22
DT, TPS Training, OT

Rapid Response Trainers
AH-1W, F-14A, UH-1N, SH-60

TACCSF - Theater Air Command Simulation Facility
AVTB - Aviation Test Bed
RESA - Research Evaluation Systems Analysis
DS&ABL - Depth and Simultaneous Attack Battle Lab

Any Questions

Manned Flight Simulator

Electronic Warfare Integ Sys Test Lab

Shielded Hangar

Large Anechoic Chamber

Threat Air Defense Lab

Operations & Control Center

Comm, Nav, IFF Lab

High Performance Computing