

# Air Force Flight Test Center

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*We conduct and support the research, development, test and evaluation  
of aerospace systems from concept to combat*



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***Making DT&E and  
Modeling & Simulation  
Better Partners***

**Dr. George Kailiwai III  
AFFTC Technical Advisor  
7 Mar 06**

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# Overview



- **Background**
  - **Need for “Teaming”**
- **Natural Tensions**
- **What Can Be Done to Team Together**
- **Examples of AFFTC Teaming**
- **Recommendations**



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# Background



- **Role of DT&E—independent verification**
  - Does system do what it was designed to do?
- **Role of OT&E—independent validation**
  - Does system do what it is supposed to do?
- **Role of M&S in DT&E**
  - Initial design
  - Refine design
  - Test design when conventional means impractical/not feasible
- **Role of M&S in OT&E**
  - Test system when conventional means impractical/not feasible

# Natural Tensions Between DT&E and M&S Communities



- DT&E may feel threatened by M&S
  - Less Testing → Less DT Work → Less Job Security
- PM may feel DT&E too expensive...takes too long
- M&S says, “We can do it all!!”

## Possible Implication:

PM question value of DT&E and be motivated to perform testing via M&S only

- Global Hawk

**WRONG APPROACH**



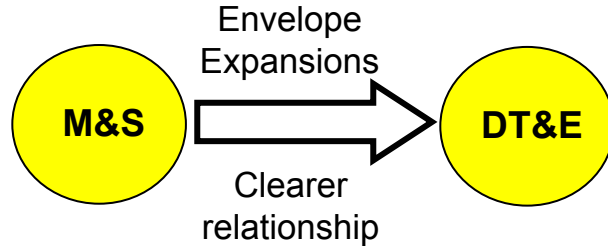
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# Current DT&E/M&S Interaction

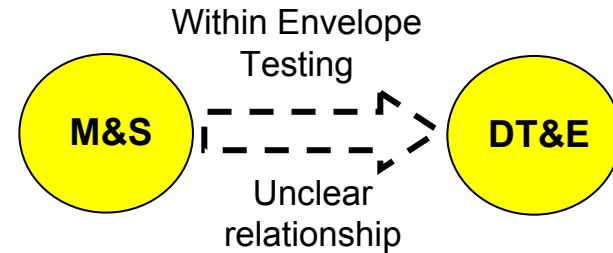


## DT&E/M&S Independent Relationship

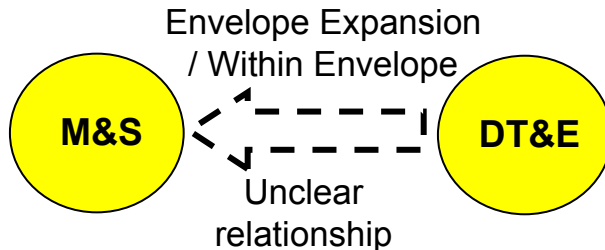
### High Risk Tests



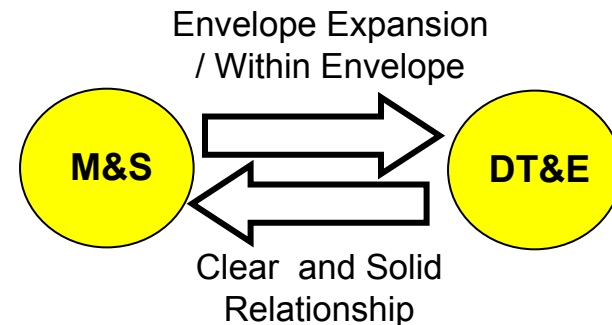
### Routine Tests



### High Risk & Routine Tests



### Preferred Relationship



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# *From Mutual Exclusiveness to Interdependency*



- **Implications of Interdependent DT&E/M&S Relationship**
  - Less Testing Needed...Less Time Needed...Less Dollars Needed....
  - Better Reputation...More Customers....
  - Increase work for DT
    - Ability to test more test articles (increase *throughput*)
    - Higher quality product
  - NCO/W natural “marriage” between DT&E and M&S
    - **Can’t do it all with M&S or DT&E alone**
    - **Full spectrum of LVC**

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# How AFFTC connects DT and M&S



- **AFFTC has successfully teamed with Boeing via CRADA to:**
  - Cross government and contractor networks
  - Tied both M&S networks together
    - Network connectivity enabled the AFFTC and Boeing to conduct exercises using Hardware in the Loop simulators
      - **AFFTC – F-16 IFAST simulator**
      - **Boeing – F-15, F-18, AWACS 4045 (simulators)**
  - Also have used other Link 16 assets in demonstrations
    - **AFFTC Network Mission Support System (in particular the Air Defense System Integrator (ADSI))**
    - **Link 16 Vans**
  - AFFTC also partnering with Boeing in JEFX 06 through AFFTC DREN link

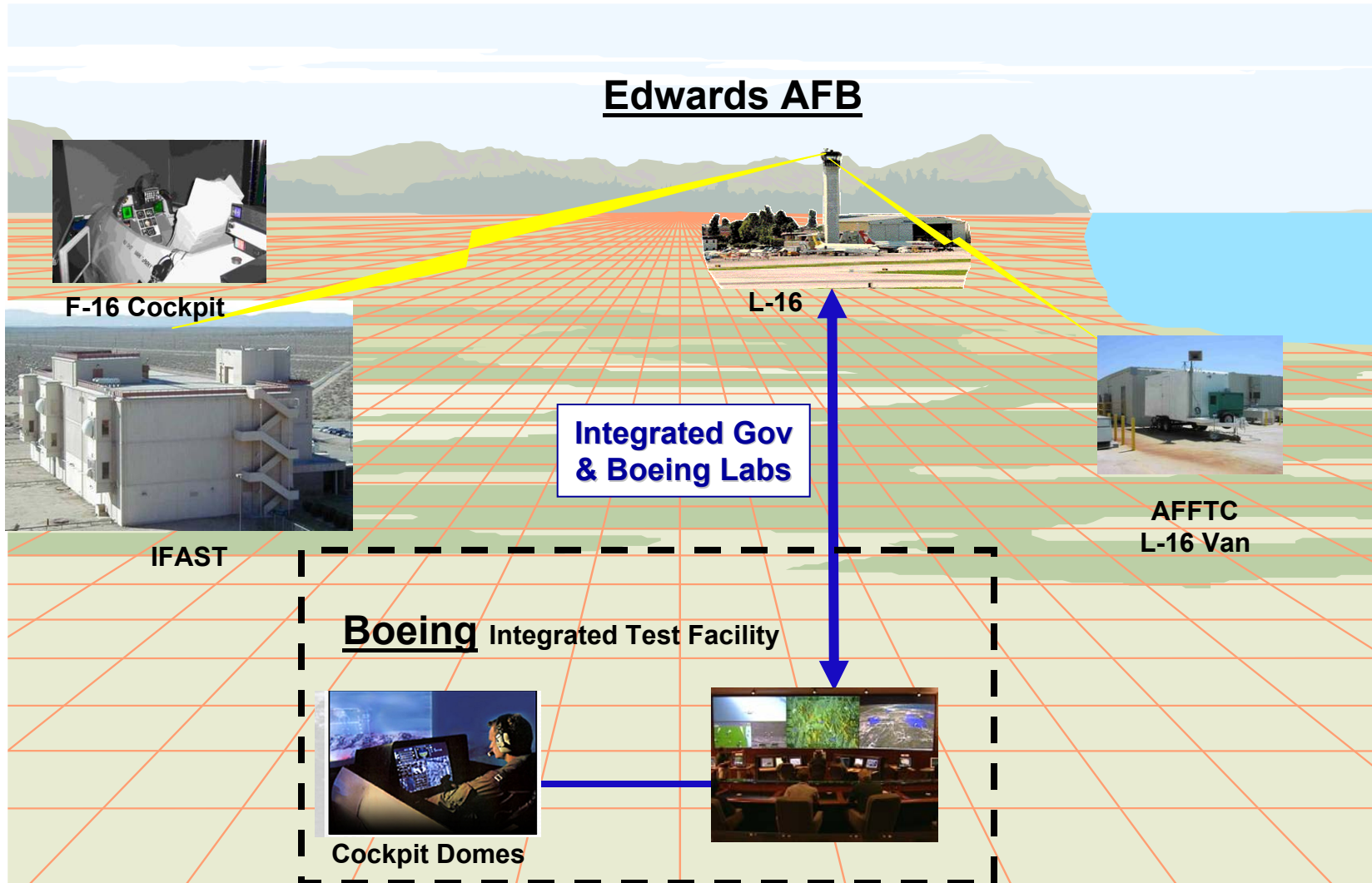


# M&S Infrastructure Integration Demo – June 2005



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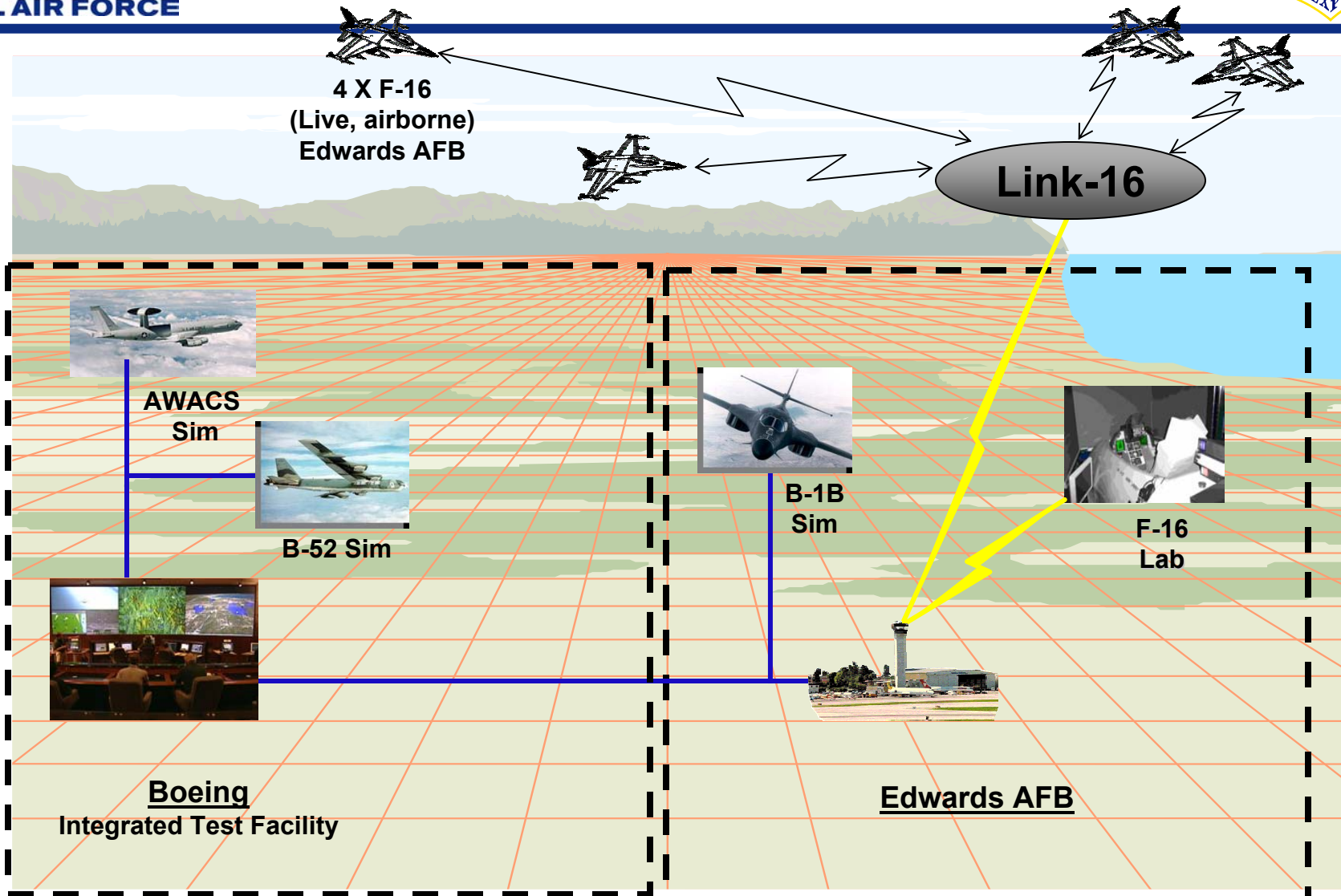
# Live & Virtual Data Link

## Integration Demonstration – December 2005



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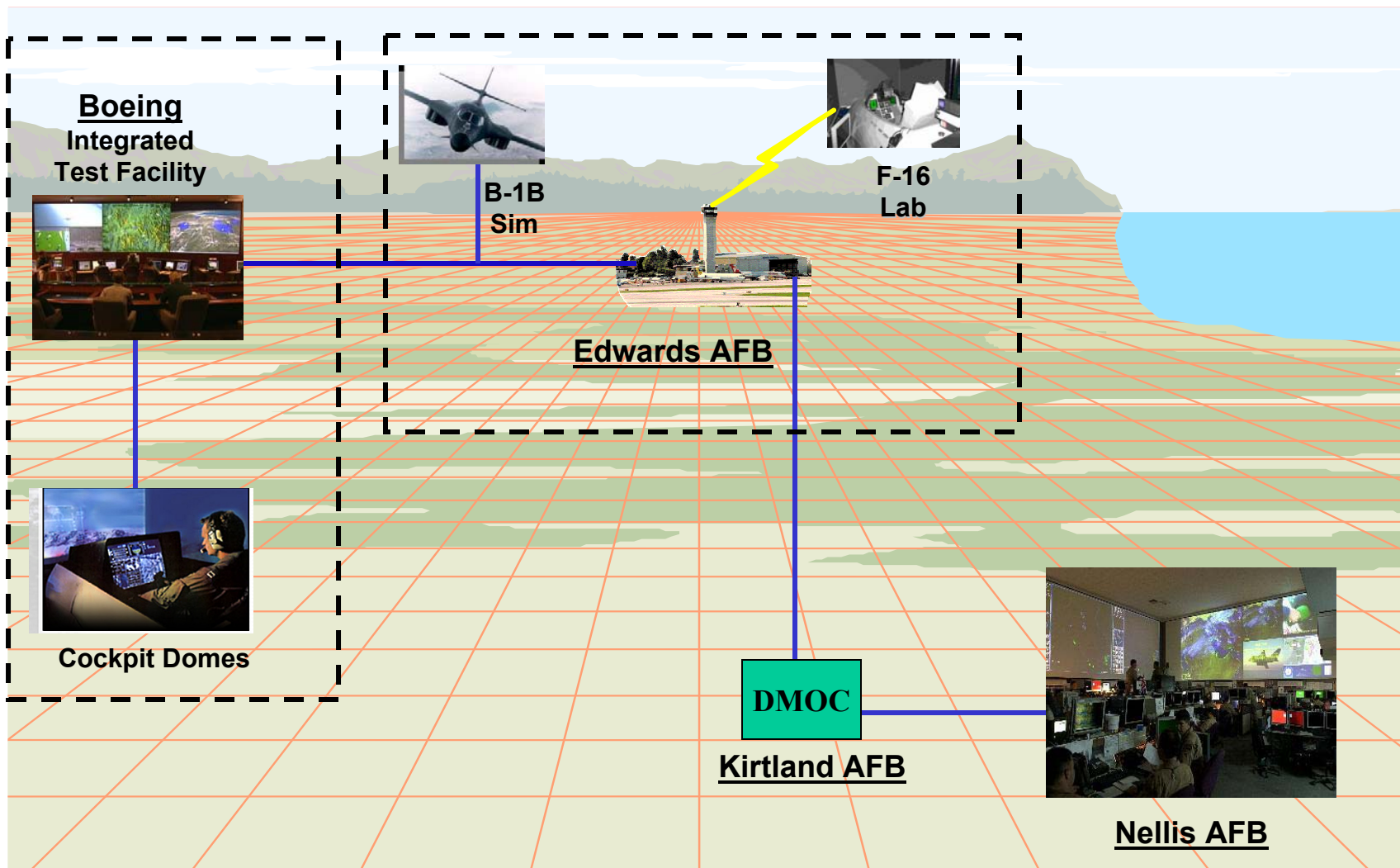
## Virtual Warfighter M&S Infrastructure Activity

April 2006

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# Recommendations



- **Develop Ways for better DT/M&S Partnership**
  - Look at how DT&E uses M&S data in testing today
    - Is M&S used to help determine how much testing is enough?
    - Are M&S data used to do better DT?
  - Look at how DT&E community feeds test data to M&S community and vice versa
    - Are test data used to refine M&S Models?
  - Look at how DT/M&S community is working together in NCO/W
    - Are there lessons learned that can apply to DT&E/M&S communities elsewhere?