Williams Foundation - Air Force Perspective of Future Live, Virtual and Constructive (LVC) Training
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Air and space power for Australia’s security
PLAN JERICHO

Jericho Vision

To develop a future force that is agile and adaptive, fully immersed in the information age, and truly joint.

Implementation Themes applied in the LVC realm

- Train as we fight
- Integrated simulation and experimentation
- Culture of innovation
- System of systems thinking

The Air Force LVC network will contribute to Joint Distributed Mission Training (DMT), Joint Collective Training (JCT) and Experimentation.
LVC Training

Challenges

- Air Force is conducting effective individual or crew training however all integrated training is currently conducted using Live assets.
- We need to train as we should, not as we can.
- The complexity of modern systems necessitates an LVC system that can stress the overall capability and personnel.
- Who is the training audience?
  - Aircrew need high end training and therefore high fidelity simulation
  - Red or White Air can generate the outcomes on lower fidelity systems (Low Cost or Part Task Trainers or Constructive)
- C2 training primacy = Low Cost or Part Task Trainers or Constructive
LVC Training Spectrum

- Training audience v’s intent

<table>
<thead>
<tr>
<th>Collective</th>
<th>Individual</th>
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<tbody>
<tr>
<td>C2 Training</td>
<td>Joint &amp; Complex Training</td>
</tr>
<tr>
<td>Tactical (crew) Training</td>
<td>Joint Test &amp; Eval’</td>
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</table>
LVC Training

Challenges

- Limited ISR integration within training constructs.
- Security
  - Compartmented solutions require Cross-Domain solutions
    - SAP / STO can integrate at lower fidelity levels, or
    - ‘Gonkulator boxes’ to translate between systems
  - Cannot train LIVE with some assets/specific capabilities – training can ONLY be conducted in the Virtual / Constructive environment.
Air Force LVC Vision

- Air Force training is a seamless blend of LVC across multiple platforms and services that challenges the total force in a range of operating environments. Specifically for Air Force the hierarchy of domains are:
  - Conversion
  - Categorisation / RTS
  - Air Force Collective Training
  - Joint ADF Collective Training
  - Combined Collective Training
Where is Air Force now?

Edinburgh
- AP-3C AFS
- AP-3C OMS
- Standalone sims. No DTEN connection.

Williamtown
- FA-18 A/B HACTS locally links multiple high fidelity simulators to each other. No DTEN connection.

Pearce
- HAWK SIM. No DTEN connection.

Amberley
- FA-18F SIM locally links multiple high fidelity simulators to each other. No DTEN connection.
- 6 x FA-18F Part Task Trainers. No links.

Richmond
- C-130J SIM
- Standalone sim. DTEN connection Q2 2015.

Tindal
- FA-18 A/B Sim. No DTEN connection.

JAWBL – linked to DTEN (Q4 2015)

Virtual Wedgetail (DTEN connected)

ADSTC – support major activities (eg. TALISMAN SABRE). White Force injects conducted locally at each SIM. No replication across SIMs. Local enclaves only.
Where Air Force will get to (2020-2025)

**Edinburgh**
- P-8A AFS
- P-8A OMS
- TRITON OMS

**Williamtown**
- 12 x JSF SIMs (~2021)
- E-7 OMS
- E-7 OFT
- ADGE Sim
- HAWK SIM. DTEN Connection.
- JTAC SIM. DTEN.
- JAWBL – linked to DTEN

**Amberley**
- FA-18F SIM locally links multiple high fidelity simulators to each other.
- 6 x FA-18F Part Task Trainers. No links.
- KC-30 OFT
- C-17 OFT
- C-27 OFT

**Pearce**
- HAWK SIM. DTEN Connection.
- Standalone sims. No DTEN connection.

**Delamere**
- LVC Adversary Weapons systems. DTEN connection.

**Richmond**
- C-130J SIM
- Standalone sim. DTEN connection Q2 2015.

**Tindal**
- 4 x JSF SIMs (~2021)

**EA-18G SIM**
Where Air Force would like to get to (2025+)

Edinburgh
- P-8A AFS
- P-8A OMS
- TRITON OMS

Williamtown
- 12 x JSF SIMs
- ADGE Sim
- HAWK SIM
- E-7 OFT
- E-7 OMS
- JTAC Dome SIM
- Virtual Wedgetail

Amberley
- FA-18F SIMs
- 6 x FA-18F Part Task Trainers
- KC-30 OFT
- C-17 OFT
- C-27 OFT
- Navy Bridge SIMs
- Army SIMs

Richmond
- C-130J SIM

Coalition SIMs

 Pearce
- HAWK SIM

Delamere
- LVC Adversary Weapons systems.

Navy Bridge
- Virtual Wedgetail

Tindal
- 4 x JSF SIMs

Scenarios and White / Red Force injects managed by distributed Joint / Combined EXCON. Multiple flexible enclaves engineered as required for training outcomes. ADF LVC network seamlessly integrated into allied LVC network.

Linkages into ADF Battle Management and C2 Systems
# Scenario 1: Defensive Operations

Small Scenario (RTS categorisation training)

Defence against a small air threat.

<table>
<thead>
<tr>
<th>Blue Force:</th>
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<tbody>
<tr>
<td>Darwin:</td>
<td>2 x LIVE JSF</td>
</tr>
<tr>
<td></td>
<td>1 x LIVE E-7</td>
</tr>
<tr>
<td>Williamtown:</td>
<td>2 x VIRTUAL JSF SIM</td>
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E-7 controls using LVC tracks across LINK-16

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<tr>
<th>Red Force:</th>
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<tbody>
<tr>
<td>Tindal:</td>
<td>2 x LIVE FA-18F</td>
</tr>
<tr>
<td>Amberley:</td>
<td>4 x VIRTUAL FA-18F SIM</td>
</tr>
<tr>
<td>Range Control:</td>
<td>CONSTRUCTIVE IADS</td>
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Instructors / White Force:

- FEG based scenario control.
Live aircraft operate from DN and TDL.

Virtual FA-18F and JSF simulators networked from Amberley and Williamtown integrate seamlessly into the battlespace.

Constructive tracks generated on DTEN and distributed via IP and datalink to platforms.

Simple Scenario

E-7 control utilising Live, Virtual and Constructive tracks via LINK-16.
## Scenario 2: Offensive Operations

### Large Scenario (Joint Collective Training)

Offensive operations against a complex IADS.

**Blue Force:**
- Darwin: 4 x **LIVE** JSF  
  1 x **LIVE** E-7 and MRTT  
- Williamtown: 2 x **VIRTUAL** JSF SIM  
- Edinburgh: 1 x **VIRTUAL** UAS  
- Sydney: 1 x **VIRTUAL** LHD Bridge SIM  
- Overseas: 1 x **VIRTUAL** USAF AC-130 SIM  
- Other entities: Linked to Army BMS and C2 constructs

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<tbody>
<tr>
<td></td>
<td><strong>LIVE</strong> EA-18G</td>
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<tr>
<td></td>
<td><strong>LIVE</strong> AWD at sea</td>
</tr>
<tr>
<td></td>
<td><strong>VIRTUAL</strong> JTAC in Dome SIM</td>
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<tr>
<td></td>
<td><strong>VIRTUAL</strong> P-8A</td>
</tr>
<tr>
<td></td>
<td><strong>VIRTUAL</strong> FFG Bridge SIM</td>
</tr>
</tbody>
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**Red Force:**
- Tindal: 4 x **LIVE** FA-18F
- Amberley: 4 x **VIRTUAL** FA-18F SIM
- Delamere: **LIVE** MTTES IADS Emitters / Mockups
- **EXCON:** **CONSTRUCTIVE** IADS  
  **CONSTRUCTIVE** Special Forces  
  **CONSTRUCTIVE** SAG (FFG / DDG)

**White Force / EXCON:** Joint and Combined exercise control.
Live aircraft operate from DN and TDL, AWD at sea

Virtual ISR, JTAC, LHD and JSF simulators networked from the ADF and US / UK integrate seamlessly into the battlespace. Virtual threats stimulate mission systems via ACMI pods.

Constructive tracks distributed via IP and datalink to platforms.
Other LVC Needs - Plan Jericho

- Experimentation
  - Supporting Capability Development
- Collective Training
  - Navy, Army and Coalition
  - The customer is the Joint Force not individuals
- LVC Policy
Summary

Jericho Vision

To develop a future force that is agile and adaptive, fully immersed in the information age, and truly joint.

Key points

• We need to train as we should, not as we can.
• Need to clearly identify the training audience and structure training accordingly.
• Security issues are real and must be addressed