To Advise and Strike

The E-7A Wedgetail
Some History...

- US Presidential Citation – WW2
- Duke of Gloucester’s Citation – Malaya
- Vietnamese Unit Citation - Cross of Gallantry with Palm
- USAF Outstanding Unit Citation with Valour Device
- The Original Magpies
Who we are

• SQNLDR Salmon

• FLTLT Machan
Scope

• Project 5077
  – Intent
  – Timeline
• Aircraft
  – Overview
  – Mission Roles
  – Crewing
• Capability
  – Now
  – Future
• Challenges
• Key Messages
• Questions
The 5077 CONOPS

• As an integral part of a layered ADF Air Defence System, the AEW&C capability will enhance surveillance, air defence, fleet support and force coordination operations in defence of Australian sovereignty and national interests.
E-7A Mission and Roles

surveillance, battlespace management, civil support operations
Timeline

- 1990s – Form the need
- 1996 – RFP
- 2000 – Boeing awarded Project Wedgetail
- 2006 – Delivery…*
  - *18 month slide
  - Boeing incurred damages
- 2008 – Further delay due ESM
Timeline

- 2009 – Scan eagle UAS control
- Nov 2009 – 2 a/c delivered to RAAF
- May 2010 – Formal acceptance by RAAF
- Nov 2012 – IOC (+5)
- Apr 2014 – OP SIO
- Oct 2014 – OP Okra
- May 2015 – FOC (+6)
Okra pre FOC??

- What is your definition of FOC?
- More later
Jet Basics

- **Wing span**: 114 ft
- **Height**: 41 ft
- **Length**: 110 ft
- **Propulsion**: 2x CFM56-7B 27,300 lb thrust
- **Inflight shutdown**: 1 per ~333,333 flight-hours
- **Engine removal**: 1 per ~18,182 flight-hours
- **Power**: 360 KVA + 90 KVA APU
- **Speed**: 0.78 M
  - 473 kt (564 mi/h)
- **Mission endurance**: >8hr combat radius at 300nm (≥20 hr with air refuel)
- **A/C reliability**: >99.6%
- **Ceiling**: 41,000 ft
- **Crew**: 12 + 9 crew rest
- **MTOW**: 171,000 lb
2 SQUADRON
ADVISE AND STRIKE

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Simulator X 2
Mission System
Multi-role Electronically Scanned Array

- Back-to-back side arrays & end-fire 'top hat' array
- High update rates for selected targets
- Enhanced detection in sectors
- Selectable radar revisit rate
- L-band
- Integral IFF system
MESA RADAR MODES

- PDA Mode - Pulse-Doppler Airborne surveillance
- SPS Mode - Single Pulse Surface surveillance
- Modes are interleaved or sectored to function simultaneously
  - Radar/IFF alternate usage of Top Hat and Side Arrays
  - Radar scan
  - Priority surv for track revisit
Modes

- **Airborne Mode (PDA)**
  - Fighter
  - Slow Airborne targets
- **Sector Emphasis**
  - Extended Range Detection
- **Maritime Mode (SPS)**
  - Fast Patrol Boat
  - Frigate
- **Radar Revisit Beams**
- **IFF Modes 1,2,3/A, C, 4 and 5**
MULTI-SENSOR INTEGRATION (MSI)

- Single track on a target with the correct ID
  - Tracking
  - Automatic ID
  - Situation & Threat Assessment
  - Sensor Management
COMMUNICATIONS

- Internal Comm
  - Consoles
  - Flight Deck
  - Radio Interface
  - Public Address
  - Rest Area
  - Group Conf
  - Point-to-Point

- HF(3)
  - BLOS
  - Clear Voice
  - Secure Voice
  - Link 11 (3)
  - ALE
  - SELCAL

- V/UHF Function
  - V/UHF(4) Guard (2)
  - FD VHF (2)
  - LOS
  - Clear Voice
  - Secure Voice
  - Have Quick
  - Guard (Tx/Rx)

- UHF Only (6+2)
  - LOS / BLOS
  - Clear Voice
  - Secure Voice
  - Link 11 (3)
  - SATCOM (2)
    - DAMA
    - Non DAMA
    - or LOS UHF

- JTIDS
  - LOS
  - Sec Voice (2)
  - Link 16 Data

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WEDGETAIL DATALINKS

• Link-11 (TADIL-A)
• Link-16 (TADIL-J/JTIDS)
• Future - Link 22
WEDGETAIL ESM

• Significantly upgraded AN/ALR 2001
  – Improved digitization, additional receiver channel
  – Provides passive detection, classification & location of Tgts
  – Collects emitter data for post-mission analysis
  – All operators can access information - EWO has A-Scope
  – Fully integrated into Mission System
WEDGE TAIL EWSP

• Passive Missile Approach Warning

AN/AAR-54
WEDGETAIL EWSP

• Large Aircraft Infra Red Counter Measures (LAIRCM)
  – Fully automated
  – IR threats
  – Separate sensor if AAR54 degraded

AN/AAQ-24 NEMESIS
COUNTER MEASURES DISPENSING SYSTEM
Crew

Aircraft Captain

Co-Pilot

Senior SCO

3x Surveillance & Control Officers

Mission Commander

Systems Officer

ESM Officer

UNCLASSIFIED
Enablers

AAR
- Day and night
- KC30 trials
Night KC-135
Night KC-10
• AAR Video
Capability NOW

- Robust radar and mission system
- Maturing support and infrastructure
- Exercises
- Operations
Exercise Red Flag Nellis

Tier 1 exercise
Most advanced threat simulation anywhere in the world
Develop/validate TTPs
Conduct check rides and upgrades (force generation/sustainment)
OPERATION SOUTHERN INDIAN OCEAN

• Civil support introduction
• Still only IOC then
• Mission timeline
The lead up to Operation Okra

JUST MENTION OVERSEAS DEPLOYMENT

AND EVERYONE LOSES THEIR MIND

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Pre OKRA Notice to Move (NTM)

– Jun 2014: 2 crews put on 24 + 72 hr NTM (50% of our line crews at the time)
– Jul 2014: NTM relaxed to 7 days. Enabled participation in Ex Pitch Black and Kakadu (RTS)
– Aug 2014 : Spool up, then down. Fish’s take on it all
– Sep 2014: ISIL were engaging ISF heavily and openly beheading captives
Pre OKRA NTM

– Sep 2014: Senior personnel called to CBR
– Sep 14\textsuperscript{th}: Deploy order
– Sep 21\textsuperscript{st}: Land in the MER.
– Sep 28\textsuperscript{th}: First (AG) mission flown
– Oct 1\textsuperscript{st}: First mission into IZ.
OPERATION OKRA

- C2 of all airborne coalition assets in IZ and SY
- ISR of IZ and SY
- 14hr missions, 1 refuel. Record….16.3*hrs
- Mission/planning timeline
OPERATION OKRA
Capability FUTURE

- Robust radar and mission system
  - AESA growth capability
- Support and infrastructure
  - FOC = sigh of relief??
- Exercises
- Operations
Jericho

• Technological and cultural integration of 5th generation capabilities with each other and legacy capabilities

• Realisation of battlespace SA available from new systems

• C4ISR is key to this information fusing
Challenges

- Aircraft
- Manning
- FOC Definition
Key Messages

• An AEW&C capability is vital for any first world Air Force
• The E-7As reputation is well deserved
• E-7A will enable Project Jericho
Key Messages

• The E-7A has become ‘the C2 platform of choice’ in theatre
  – CAF - Australian Aviation April 2015

• We are not special…just different
  – XO42 WG
AAR with KC-30