Australian F-35A Project Update

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19 July 2017
F-35A is the **right capability** for Australia.

F-35A capability is **far beyond** 72 aircraft.

The F-35 Program is **transforming Australian industry** and growing the Australian economy.

We are **on track** to achieve Initial Operating Capability by December 2020.

The risks that remain in the project are being **proactively managed**.
F-35A – The Right Capability for Australia

- F-35A Capability - What it is.
- More than just the aircraft
- The Global Program
- Australian Industry Involvement
- Major Milestones
## F-35A Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Length</td>
<td>51.4 ft / 15.7 m</td>
</tr>
<tr>
<td>Height</td>
<td>14.4 ft / 4.38 m</td>
</tr>
<tr>
<td>Speed</td>
<td>Mach 1.6</td>
</tr>
<tr>
<td>Wingspan</td>
<td>35 ft / 10.7 m</td>
</tr>
<tr>
<td>Wing Area</td>
<td>460 ft² / 42.7 m²</td>
</tr>
<tr>
<td>Combat Radius (internal fuel)</td>
<td>&gt;590 n.mi / 1,093 km</td>
</tr>
<tr>
<td>Max Take-Off Weight</td>
<td>~70,000 lbs</td>
</tr>
<tr>
<td>Range (internal fuel)</td>
<td>&gt;1,200 n.mi / 2,200 km</td>
</tr>
<tr>
<td>Internal Fuel Capacity</td>
<td>18,250 lb / 8,278 kg</td>
</tr>
<tr>
<td>Max g-rating</td>
<td>9.0</td>
</tr>
<tr>
<td>Weapons Payload</td>
<td>18,000 lb / 8,160 kg</td>
</tr>
<tr>
<td>Propulsion</td>
<td>F135-PW-100</td>
</tr>
<tr>
<td>Thrust*</td>
<td>40,000 lb / 25,000 lb Mil</td>
</tr>
</tbody>
</table>

*Max Power (Max) = with afterburner / Military Power (Mil) = without afterburner
PILLARS OF CAPABILITY

- The F-35 is the most capable and affordable aircraft to meet Australia’s future threat environments. Why?
  - Lethal
  - Affordable
  - Survivale
  - Supportable

Next Generation Technology = Total Air Dominance
What is 5th Generation

The Evolution of Stealth

1st Gen
- 1st Jets
- Subsonic
- Guns
- Bombs
- Rockets

2nd Gen
- Supersonic
- 1st Radar
- Missiles
- Guns

3rd Gen
- Multi-Role
- Supersonic
- Radar
- Missiles

4th Gen
- Adv Avionics
- Guided Weapons
- Agility & Speed

5th Gen
- Stealth
- Fighter Performance
- Internal Payload
- Information Fusion
- Network Centric Ops
- Sustainable
- Deployable

Advantage With Training
Total Air Dominance

1st Jets
Subsonic
Guns
Bombs
Rockets

Supersonic
1st Radar
Missiles
Guns

Multi-Role
Supersonic
Radar
Missiles

Adv Avionics
Guided Weapons
Agility & Speed

Stealth
Fighter Performance
Internal Payload
Information Fusion
Network Centric Ops
Sustainable
Deployable

40s
50s
60s
70s
2005+

High and Fast
Air-to-Ground Only at Night
All Stealth – 24/7/365
Jet Fighter Generations

Generation 4.5

The United States Government defines 4.5 generation fighter aircraft as fourth generation jet fighters that have been upgraded with AESA radar, high capacity data-link, enhanced avionics, and "the ability to deploy current and reasonably foreseeable advanced armaments."
Fundamental 5\textsuperscript{TH} Gen Design Features Can Not Be Retrofitted

- Internal Fuel Tanks
- Fixed Array Radar
- Engine Inlets
- Full Line-of-Sight Blockage
- Aligned Edges
- Embedded Antennas
- Reduced Signature Nozzle
- Internal Stores Carriage
- Curved ‘Diverterless’ Inlets
- “Buried” Engine
- Reduced Signature Axi-Symmetric Nozzle
- Composite Structure
- Radar Absorbing Material (RAM)
- Large Capacity Internal Fuel Tanks
- Aircraft Shaping and Edge Alignment
- Embedded Antennas
- Weapons Carried Internally
- Low Observable Seams, RAM Seals
- Low-Emission Radar and Avionics
- UNCLASSIFIED
Survivability Kill Chain –
Break *Any Link* to Survive, Earlier is Better

- Avoid Detect
- Avoid Shots
- Survive Hit
VIDEO – F-35 Smart Fighter for the Warfighter
More than Just an Aircraft
What is ALIS?

The Autonomic Logistics Information System (ALIS)

- The off-board information system for the F-35;
- Essential to F-35 operations;
- Provides the information system infrastructure (hardware, software and data) that performs:
  - Flight Scheduling
  - Mission planning / debriefing
  - Maintenance Management
  - Fault diagnostics
  - Supply support
  - Training Management
The **Off Board Information Support Centre** (OBISC)

- A ‘Sand Pit’ for ALIS
- Provides a safe test environment for upgrades
- Development of Procedures
- Integration into Defence Networks
- Opened 5 July 2017 – JSF’s first Australian Facility
  - Williamtown
Video: Keeping the F-35 Mission Ready
What is ACURL?

- Australia Canada United Kingdom Reprogramming Lab (ACURL)
- Mission Data Files (MDFs) enable the F-35 to be a “smart” aircraft
- MDF compiles information about the threat environment (eg other assets in the area) and is loaded onto the aircraft via a “brick”
- Enables the clearest battle space picture of any modern platform
- The Reprogramming facility that produces the MDFs is due to be operation by the end of 2018
- Located at Eglin Air Force Base, Florida co-located with US Reprogramming Lab
F-35 Global Program

- US Government Leading – Joint Program Office (JPO)
- Nine Partner Nations
- Foreign Military Sales
- Production will reach **200** F-35s by the end of 2017
- Global F-35 fleet of around **3,000** by 2035
- F-35 Global Support Solution (GSS)
- Global Industry opportunities
- Collaboration and competition with Partners
US Services (USAF, USN, USMC)
- US (2443 F-35s)

Partners (signatories to PSFD MoU) < 1000
- UK (135 F-35s)
- Italy (60 F-35A’s / 30 F-35Bs)
- Australia (100 F-35As)
- Turkey (100 F-35As)
- Netherlands (37 F-35As)
- Canada (65 F-35As)
- Norway (52 F-35As)
- Denmark (27 F-35As)

• FMS
  - Israel (50 F-35As)
  - Japan (42 F-35As)
  - South Korea (40 F-35As)
A Maturing Program

- Complex Program – developing, building, operating and sustaining aircraft all at the same time
- Production ramp starting now
- Still in development phase of Program
- Early technical challenges being overcome

<table>
<thead>
<tr>
<th>Egress</th>
<th>Helmet</th>
<th>Weapons/MS Integration</th>
<th>Engine</th>
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<tbody>
<tr>
<td><img src="image1" alt="Egress Image" /></td>
<td><img src="image2" alt="Helmet Image" /></td>
<td><img src="image3" alt="Weapons/MS Integration Image" /></td>
<td><img src="image4" alt="Engine Image" /></td>
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A Maturing Program

- 46 F-35s delivered in 2016
- The F-35 is now operating from 12 different locations
- Collectively, the F-35 fleet has flown over 95,000 flight hours
- Around 200 F-35s in operational service
- More than 400 pilots trained
- Almost 4,000 maintainers trained
- System Development and Demonstration (SDD) phase 95% complete by April 2016
- 229 jets on contract
• Partners in the F-35 Program have invested in a Global Support Solution (GSS)
• Three broad regions – Europe, US and the Asia-Pacific
• Best value, available and common support system for F-35s worldwide
• JPO is challenging Partner nations to find mutually beneficial ways to reduce costs
• Performance based construct
• Overall objective of the GSS is to improve cost, schedule and performance
• Australia leveraging the GSS but also ensuring sovereign support requirements are maintained
• This is a transformational way of doing business
The Global Support Solution (GSS)

GSS Services performed by CoA. ie consciously removed PBA / PBL Construct (ie Sovereign Sustainment Requirements)

Australian Sustainment Services Boundary

ADF Sustainment Services. Australian requirements that are not part of the GSS.

GSS Services delivered by PSM, PSIs and PSPs under the PBA / PBL Construct

GSS Sovereign Obligations that CoA has determined are best delivered through the PBA / PBL Construct. (Aus PBL)

GSS Services delivered by Australia (Sovereign Obligations)
Australian industry involvement in F-35 production is expected to reach $2 billion by 2023.
• Further opportunities expected as F-35 production rates triple

• Performing better than initial Defence forecasts

• Value of Australian contracts increased by 23% (Dec 15 – Dec 16)

• Further opportunities in F-35 Sustainment
The F-35 Program is driving innovation and efficiency and opening up export opportunities for Australian industry.


- Participation in the F-35 production program has supported an additional 2,400 jobs across the Australian economy.

- At peak production workload, forecasts indicate AUD$1 billion (real GDP) contributed to the Australian economy with an additional 5,000 jobs supported across the Australian economy.

- By 2038, Australian economy will be AUD$1.2 billion (real GDP) greater with an additional 6,300 jobs supported.
Australian F-35A Project Update

- First two jets delivered December 2014
- Over 1,000 combined flying hours to date by Australian F-35A’s
- Four qualified Australian pilots and two more in training
- Collaboration with Partners

- On schedule to achieve IOC by December 2020
- Total approved budget for Australian F-35A Project is AU$17.7 billion
- Includes 72 F-35A aircraft along with infrastructure, training and support systems, and weapons.
Australian F-35A Project Milestones

- 2014 – Delivery of first to jets in the United States
- 2015 – Training starts in the United States
- 2018 – First aircraft arrive in Australia
- 2020 – Initial Operating Capability
- 2023 – Final Operating Capability

Australia has one of the most aggressive F-35 integration schedules of any Partner nation outside the United States

Australia’s acquisition profile:

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<td>15</td>
<td>15</td>
<td>9</td>
<td>72</td>
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Areas of Focus / Challenges

- Support systems in place ready for first ferry in 2018
- Adapting F-35 Program training systems to meet Australian requirements
- Integrating the F-35 Autonomic Logistics Information System (ALIS) into the Defence Information Environment (DIE)
- Achieving Australian industry outcomes
- Being a smart customer and supplier of the Global Support Solution (GSS)
- Reprogramming
- Sovereign Data Management (SDM)
- Global Program spares issues
- Training
• We are working together to deliver the largest global Defence acquisition Program in ADF history – challenging and exciting times

• Addressing challenges head on

• 32 full time qualified Australian personnel based in the United States as part of the global Program

• Making steady progress to reach Initial Operating Capability by 2020

• Multi-level advocacy of Australian Industry capability will be crucial to achieving industry outcome
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