

'Archangel' watching over project Air 6000

Trevor J Thomas/CANBERRA

In an unprecedented and radical shift in national defence policy, the Royal Australian Air Force looks set to acquire 24 Boeing F/A-18F 'Super Hornet' strike fighters, as a hedging strategy to offset emerging 'capability gaps' between retirement of the F-111C fighter-bomber force, and delays in the timing (or changes to the cost/benefit mix of early-production units) of the new Lockheed Martin F-35A 'Lightning II' Joint Strike Fighter (JSF).

Boeing officials in Australia have for several years been quietly promoting the F/A-18 'Super Hornet' option to the Australian Government and military-capability officials, under the reportedly code-named project 'Archangel', which is understood to encompass a global endeavour to secure exports of the aircraft to friendly allies, and estimated to be in the order of 200+ units.

The company is believed to have acted in a manner by which it was not seen to be questioning the generally concluded preference of the Australian military for the F-35A, but instead, sought to point out issues of risk associated with any new military technology program, along with implications for RAAF capability sustainment of any accumulating delays in F-35A availability beyond previously nominated critical phase-out dates for Australia's F-111 fleet (see Chart 1 below).

As ADBR reported in its last issue (refer Vol.25, No.10 - 30 November 2006, p14), the technological risk curve leading up to the

Key Points

- A 'bridging' acquisition of 24 'Super Hornet' strike fighters is heading a list of 'options' to sustain Australian air combat capability, should delivery of the Joint Strike Fighter fall outside the RAAF's project Air 6000 F-35 'Best Case' conversion plan.
- Next on the list of options appears to be further sustainment measures beyond the current project Air 5376 'Hornet' Upgrade (including extended range JASSMs), the former of which is currently suffering from delays to vital complementary air-to-air refuelling and airborne surveillance programs.
- Defence is also believed to be entertaining new upgrades to the F-111 fleet, previously cancelled in earlier Defence Capability Plans, but now being regenerated around the addition of new tactical data links and strike weapons, such as the JDAM.
- A revitalised, and Democrat controlled, 110th Congress will shortly commence deliberations on the composition of the FY 2008 US Defense budget, seeking to block funding for extra troop deployments to Iraq, and cut back on development projects (including the JSF), when funds are not properly requested in the formal financial year's budget process.



REPLACING THE 'DUMP & BURN'?: The RAAF's favourite F-111 air show manoeuvre - where fuel is expelled into the hot exhaust gasses of the aircraft's engines in reheat to create a flaming plume - is set to be replaced by the Super Hornet's supersonic 'shockwave', achieved by rapidly accelerating to Mach 1, which creates a large cloud of condensation on the aircraft's flying surfaces. US NAVY PHOTO

first JSF flight on 15 December 2006, is generally viewed as having been well managed by Lockheed Martin. In a brief

statement issued the next day, Defence Minister Nelson said "the Government congratulates the JSF Program Office and Lockheed Martin on their successful management of the JSF Program, and their achievement of this significant milestone in Defence aviation history. In comparison to previous test programs, the JSF continues to exceed in both performance and schedule."

The aircraft's first flight, however, came at the back of the previously advertised flight test envelope, and (acknowledging the intervening holiday season), the second flight was not achieved for a further six weeks (on 9 January 2007), despite assurances in Canberra in October by USAF Brigadier General Charles Davis, Project Executive Officer - JSF, that follow-on flight tests would proceed pretty quickly after the inaugural flight had been undertaken.

According to Davis, when speaking at an official Defence media conference at Russell, "the goal of flying that aeroplane is to make sure that when it flies, it can go up the very next day and fly again, and the next day and fly again, the next day and fly again. We'd much rather make it a viable test plane than try to fly to meet a date."

In the meantime, the growing challenge of funding the burgeoning war in Iraq (and other related 'War on Terrorism' costs) - combined with the Republicans' loss of control of both Houses of the Congress last November - have put a new shadow over major US military capability development programs not considered immediately related to the task at hand in Iraq and Afghanistan. These have been made worse with President George W Bush's 10 January decision to increase US troop numbers in Iraq, estimated to cost an additional US\$5.6 billion.

Further, the Bush Administration's frequent resort (aided by its

Chart 1: RAAF Air 6000 Conversion Plan - Ideal (or 'Best Case')

Unit	Role	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
No. 1 Sqn	Strike	F-111C	F-111C	F-111C	F-111C	F-111C	F/A-18A/B	F/A-18A/B	F/A-18A/B	F/A-18A/B	F/A-18A/B	F/A-18A/B	UCAS	UCAS
No. 6 Sqn	Strike Training	F-111C/G	F-35 AA	F-35 AA	F-35 AA	F-35 B I	F-35 B I	F-35 B I	F-35 B I	F-35 B III	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 3 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F-35 B II	F-35 B II	F-35 B II	F-35 B II	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 75 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F-35 B III	F-35 B III	F-35 B III	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 77 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F-35 B III	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 2 OCU	Tactical Fighter Training	F/A-18B	F/A-18B	F/A-18B	F/A-18B	F/A-18B	Disbanded							
Codes: AA - Adoption Agency; B-1 = F-35 Block I; B II = F-35 Block II; B III = F-35 Block III														
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control of both Houses of Congress) to padding out 'Supplemental' Middle East war funding requests with resources for non-war related developmental programs (including the JSF) - for which adequate funding was not secured in the relevant financial year's formal Defense Budget - has been placed by Democrats at the head of a list of reform activity to be effected by the 110th Congress as it commences New Year sittings.

Early indications are that the Bush Administration will lodge with Congress in late-January another FY 2007 Emergency Supplemental defense appropriations request, seeking a massive US\$99.7 billion (set prior to the decision to commit an additional 21,500 troops to Iraq), and which also includes large sums for developmental programs. There appears no question, however, that the FY08 budget - which itself will be a record request exceeding FY07's \$462 billion - will be sent to the Congress on 5 February.

ADBR further understands an FY08 'bridge' Supplemental is also currently being built within the Pentagon, far earlier and in more detail than any previous bridge request, and perhaps containing cost saving measures in 2007 developmental programs (ie: to find another \$5.6b for Iraq), thus effectively shifting them into FY08 defense budget proposals.

Accordingly, the early consideration by Congress of all these military funding requests, especially the fate of the burgeoning Supplementals, is likely to provide the Australian Government with an improved picture upon which to judge the merits (or in-

evitability) of the lead Block II 'Super Hornet' 'bridging' option, which is now expected to be publicly confirmed by Prime Minister Howard in early-March.

Several iterative updates (incorporating much of the above) by Boeing officials to previously unsolicited proposals by the company, and including a privileged window into Block III development proposals (alluded to in part by company officials at the UK's Farnborough Air Show in July), are believed to have ignited two-way discussions with Department of Defence Capability Development executives earlier this year.

Acquisition 'atmospherics' were then further firmed up after Defence Minister Nelson publicly acknowledged he had asked the RAAF and DMO to look at other options for sustaining RAAF strike capability (should the F-35 be delayed), when confirming 'first pass' approval for phase 2A/B of project Air 6000 on 11 November 2006.

Boeing Integrated Defence Systems (IDS) head, Jim Albaugh, 'Hornet' International Sales chief, Rick McCrary - plus a large entourage of Boeing officials - conspicuously visited Canberra in early-December (at the time of the C-17 delivery - see article page 11), both to meet with senior ADF and government ministers, and to be available to support Cabinet discussions. Such interactions are understood to have ultimately generated a request to Defence to lock down details regarding the 'Super Hornet', in order that they could be formally considered by the National Security Committee of Cabinet early in the New Year.

In short, provisional agreement now appears to have been reached within senior levels of government that the RAAF's lead strike capability 'gap filling' option is for the Air Force to acquire 24 dual-seat F/A-18Fs, principally as a means to bridge the necessary time delays now embedded in US Defense budget forecasts, and thus provide the ADF with a more realistic time frame upon which it can plan to achieve effective JSF introduction.

If progressed in the manner outlined above, such an option would also allow support arrangements for the F-111s to be wound down from 2008, thus achieving major savings (estimated at >\$1 billion) in the run up to a full retirement of all airframes of this type in 2010.

Early supplementation of 'Super Hornet' aircraft to the RAAF's fleet would also provide it with options to cut back on the number of expensive early-build Low Rate Initial Production (LRIP) F-35s first proposed to be acquired under phases 2A/B of project Air 6000 (refer again Chart 1 on page 7).

Due to cut backs in LRIP numbers - the deepest of which are anticipated in the still to be confirmed Lot 3 - early-build JSFs will be much more expensive and less capable than later production aircraft (ie: Blocks III and IV). As such, initial project Air 6000 budgeting has been undermined, thus pushing the Government to further delay Cabinet consideration of any JSF purchase commitment to "late-2007" (read '2008').

The 'Super Hornet', with its Raytheon active electronically scanned (AESA) radar and limited stealth features, is considered

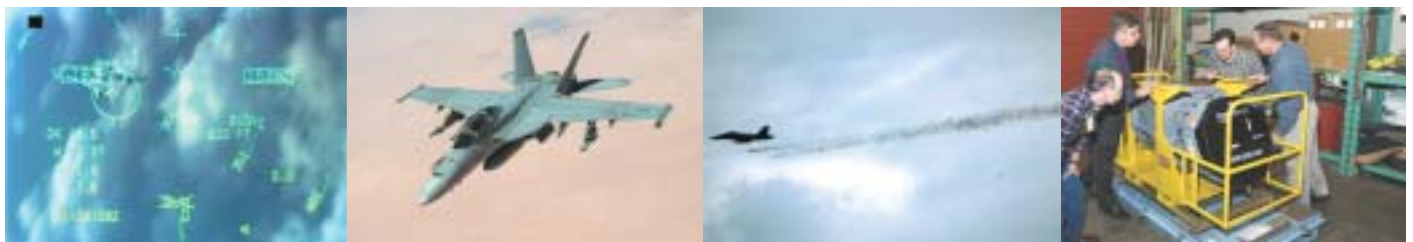
by many to offer the RAAF a comfortable enhanced generational transition aircraft between the fourth generation F/A-18A (HUG), and fifth generation F-35A.

Yet the 'Super Hornet' - which had its genesis in the 1990s - is less of a match for later-Block versions of the F-35, principally due to the F-35s more sophisticated integration of its fused sensor suite, and the intelligence, surveillance and reconnaissance capabilities the plane would bring to future coalition warfare fighting capabilities.

Still, uncertainty within the political elite of the Australian government as to when later-build JSFs will actually become available to the RAAF - given that rapid political developments and Defense funding cuts in the United States might make optimistic statements by Australian military officials (including Defence Minister Nelson) irrelevant overnight - appears to have overtaken reservations within government against the taking of definitive action as the fuller 2007 Australian election year begins to unfold.

The fact that Defence is gearing up for a concerted F/A-18F marketing campaign was confirmed late in 2006 with news of the appointment of Air Commodore Mark Binskin (as the Capability Development Executive's new Director General Capability Management - Air Force), capped by Binskin's ready willingness to talk to specialist defence media.

In short, the case for a bridging transition was suitably summed up in a written statement provided to 'Australian Avia-



WHAT THE 'RHINO' BRINGS TO THE RAAF'S TABLE: Known in the US Navy as the 'Rhino' (in order to prevent confusion with arrestor wire settings for legacy Hornets during delicate carrier landings), the F/A-18F 'Super Hornet' has proven itself in combat as a highly capable tactical fighter and strike aircraft, even getting the F-22A 'Raptor' in its sights on occasion (far left). The aircraft comes already integrated with a range of existing and 'on-order' RAAF weapons, including the JASSM (via a common JSOW integration), although it would require a costly integration to accommodate the ASRAAM - no doubt explaining Defence's issuance in 2006 of an RFI for the AIM-9X to provide IR homing capability for air-to-air combat (left centre). The 'Super Hornet' can also deploy PDU-5 leaflet bombs, providing a ready delivery mechanism for the ADF's new Joint Project 2076 'psychological operations' (or Psyops) capability, as a means of getting the 'right' message out (right centre), and would also provide the RAAF an early window into developing AESA radar ISR capabilities courtesy of Raytheon's APG-79 (far right).

VENDOR & US NAVY PHOTOS

tion' magazine, which quoted him as saying, "the Minister has emphasised that Australia will not accept an air combat capability shortfall. Defence continues to develop contingency options to ensure Australia maintains its air combat capability edge during the transition to the New Air Combat Capability (NACC)."

Binskin acknowledged one option being analysed was "to obtain 24 Boeing F/A-18F 'Super Hornet' aircraft to supplement our fleet of upgraded F/A-18s during the transition from F-111s to a fully operational F-35 JSF force. Selecting the F/A-18F 'Super Hornet' would build on a very successful association with our current F/A-18 fleet. It would (also) provide a highly capable combat aircraft that is currently in service with the US Navy."

Super Hornets are currently being delivered to US Navy units under a multi-year fixed price production plan at a unit cost of US\$53.8m (aka A\$70m). Allowing for foreign military sales fees, weapons, electronic warfare equipment and other add-ons, support infrastructure and equipment, and initial spares, this would likely translate to upwards of A\$100m per aircraft, depending on the longer term sustainability of the recently robust local currency.

Other benefits of a 'Super Hornet' buy would be the opportunity to move to a multiple-type fleet which, by diversifying the force structure, would allow RAAF strategists: greater flexibility in operational planning; a spreading out of funding packages required to replace the 100-strong F/A-18A/B and F-111 force at the end of their lives; and full leveraging of almost three decades of accumulated RAAF investment and F/A-18 operational experience.

Reaffirming such points, Binskin noted the Air Force "has

a deep understanding of F/A-18 systems and technical support, as well as strong relationships with suppliers. This makes the 'Super Hornet' a low risk option to ensure Australia's capability edge is maintained at a time of major equipment renewal and change for Air Force. If obtained, the 'Super Hornet' would provide Air Force with the flexibility to assign all Air Combat force aircrew and technical workforce across a relatively common fleet during the transition to the F-35 JSF."

In order to be properly incorporated into the 2007/08 Australian Federal Budget (due 8 May 2007), formal 'Super Hornet' acquisition submissions and approvals will need to have passed through essential Defence Committees by end-February 2007. Conventional wisdom suggests the RAAF should be able to start taking delivery of Super Hornets by late-2009, given previous Boeing statements its aircraft production system is generated towards delivering on-the-ground capability "within 18 months" of a contract signature.

Aiding this level of responsiveness is a relatively well known fact that F-18E/F Block II deliveries to the US Navy are well past the first dozen aircraft (and moving to production rates of a dozen/a month), whilst also being several months ahead of schedule. So, similar to the RAAF's recent experience with its initial C-17 'Globemaster III' transports (the first of which was delivered within 12 months of contract sig-

nature), 'Super Hornet' aircraft destined for Australia could also be expected to be readily extractable from US Navy production slots.

Additionally, any early decision to acquire 'Super Hornet' aircraft (see Chart 2 below) would assist the RAAF to quickly reorganise hu-



man resources and support arrangements for later F-35A introduction, as similarly done following the un-

expected decision to purchase four C-17s. In short, it could be anticipated the remaining F-111Gs (which fly with 6SQN) could be retired almost immediately, allowing 6SQNs F-111Cs to be transferred to 1SQN.

Training simulators recently installed at RAAF Base 'Williamtown' (NSW) by Raytheon could also receive a rapid software upgrade (as already being used by the US Navy), in order to support an Initial Operational Capability of 12-14 'Super Hornet' aircraft by mid-2011, with Full Operational Capability by the end of 2012.

As previously noted, Boeing's bid to sell Australia the 'Super Hornet' is part of the wider project 'Archangel', which has pitched the aircraft (and supporting industrial production offset plans) to various nations in Australia's wider region, and including: Japan, India and Malaysia.

Japan and India each have 120+ aircraft requirements, as well as a mature indigenous aircraft manufacturing capability eager to attract final assembly work, and major components (including engines) manufacture. Malaysia, in seeking to replace its eight F/A-

18Ds, would no doubt be interested in smaller high technology-intensive components production.

Further, any Australian decision to purchase the 'Super Hornet' would provide Boeing with a critical first export success, thus opening up significant leverage for local Boeing subsidiary, Hawker de Havilland, to secure work across the entire 200+ potential export base (ie: not just for Australia), and before any US Block III upgrade work is taken into account. In the initial stages, it could be expected Hawker's would win additional 'Super Hornet' honeycomb structure and assorted composite fabrication work.

US Navy 'Super Hornet' aircraft are powered by two General Electric (GE) F414 engines, which hark from the same F404 engine family as the RAAF's existing A/B 'Hornet' fighters. A more powerful version of the F414 is, nevertheless, currently being jointly developed by GE and the US Navy, under the US Government's Integrated High Performance Engine Technology (IHPTET) program.

The F414 (or XTE77/SE2) advanced technology demonstrator engine was said 13 December to have successfully completed a test program demonstrating its advanced two-stage, all-blisk (blade and disk) fan and new high-pressure turbine design. The engine was run to 100% of maximum steady core speed, over 20+ hours of testing.

The new fan design incorporates 3D-aerodynamic forward-swept airfoil technology (providing 10% higher airflow), improved efficiency and a reduced parts count when compared with fans in current F414 engines. Officials indicated this second phase of testing built on work completed in 2005, with the aim of verifying the advanced, six-stage compressor configuration. [ADBR]

Chart 2: RAAF Air 6000 Conversion Plan - F-35 Delay (or 'Worst Case')

Unit	Role	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
No. 1 Sqn	Strike	F-111C	F-111C	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F
No. 6 Sqn	Strike Training	F-111C/G	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F	F/A-18F
No. 3 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F-35 B II	F-35 B II	F-35 B II	F-35 B II	F-35 B III	F-35 B III
No. 75 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A18A/B	F/A18A/B	F/A18A/B	F/A18A/B	F/A18A/B	F/A18A/B	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 77 Sqn	Tactical Fighter	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F/A-18A	F-35 B III	F-35 B III	F-35 B III	F-35 B III
No. 2 OCU	Tactical Fighter Training	F/A-18B	F/A-18B	F/A-18B	F-35 AA	F-35 AA	F-35 B I	F-35 B I	F-35 B I	F-35 B I	F-35 B I	F-35 B III	F-35 B III	F-35 B III

Codes: AA - Adoption Agency; B-1 = F-35 Block I; B II = F-35 Block II; B III = F-35 Block III

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