

# Affordability

## and the new air combat capability

Peter Goon

### New air combat capability

To avoid losing our technological edge in the region, Australia's current air combat capability will require significant modernisation over the next decade or so. This will involve either the acquisition of new aircraft, or a mix of new aircraft and the life-of-type extension and 'system of systems' re-equipment of existing ones.

One option is to replace our F/A-18 fighters and our F-111 strike and reconnaissance aircraft with the F-35 Joint Strike Fighter (JSF) currently under design and expected to fly sometime after 2006. Another option is to enhance our existing F-111 fleet and buy a smaller number of new aircraft with greater capability than the JSF, namely the super-cruising F/A-22A Raptor. Such an option would be similar to the hi-lo mix concept employed by many of our allies and considered in Australia at the time the Mirage fighter was replaced with the F/A-18A.

The JSF option enjoys much support in political and defence departmental circles, not least because of a belief that it is seen to suit our strategic alliance with the United States. It is also widely assumed to be a cheaper alternative than latest generation aircraft, especially the F/A-22.

The rolling ten-year Defence Capability Plan (DCP) currently includes a project termed the New Air Combat Capability (NACC). While Australia has not yet formally ordered the JSF as the aircraft sought under this project, the Department has progressively committed us to the preliminary phases of the overall \$US260bn multinational JSF program.

These phases involve the seven countries presently interested in procuring the JSF. Further commitment to the program involves a co-operative agreement in late 2006 and a final decision to order in 2008.

According to the April issue of *Defence*, some 18 Australian companies have won contracts to a value of over \$A60m in the SDD phase. Even assuming a healthy EBIT ('profit') from these contracts of 15 per cent, and considering the level of investment being made by Government and Industry to win this work, such a 'loss leader' business model is certainly a courageous move on the part of all involved.

### Stretch the dollars another way

The effective exclusion of the F/A-22A from consideration for the NACC is mainly based on the assumption that while it is a more capable aircraft than the JSF it is too expensive. The F/A-22 was designed to be at least twice as capable as the F-15 it replaces (in fact, by some measures it is better than eight times more capable). It has been described by many as the best fighter aircraft ever built.

The most brief of comparisons is that the F/A-22A is stealthier, more agile, and much faster than the JSF. It also carries an equivalent internal bomb-load plus two additional air-to-air missiles (internally), can lift around 50 per cent more external payload, has around 50 per cent more total fuel capacity, and has twice the radar surveillance/reconnaissance footprint of the JSF. With its unique supersonic cruise capability and high agility it is more productive and lethal than the JSF is intended to be in many key roles, and is much more survivable. While the JSF is being designed mostly to support ground troops on the battlefield, the F/A-22A was designed to destroy opposing aircraft, and penetrate heavy air defences to destroy key ground targets using smart bombs.

At the end of the currently approved production run of about 180 units for the US Air Force, the F/A-22A will cost around \$US126m each, being its full Initial Operational Capability (IOC) Procurement Price. Analysts in the US, even earlier opponents of the Raptor, believe the current production program is likely to be extended to the full USAF requirement of 380 aircraft, and possibly beyond. This being the case, later aircraft build costs will come down.

Using the DCP's current median budget for the NACC of \$A13.5bn, the full IOC Procurement Price for the F/A-22A would mean that Australia could theoretically afford to buy 75 F/A-22 aircraft (using around a five hedging points exchange rate of 0.700, ie. \$US126m = \$A180m). In capability terms for many key roles, this would be equivalent to buying 150 JSFs or more.

Various cost figures for the Raptor have been quoted by the Department of Defence over recent years, ranging from \$US350m per aircraft to the more recent \$US153m in the ASPI Strategic Insight Paper last year. Even if it is \$US153m, given the mean NACC budget (as per the DCP) of \$A13.5bn, and using the same hedging exchange rate as above, this

mean budget would be able to support procurement of 60 plus aircraft.

It should be noted in comparison that the price most commonly cited in Australia for the JSF is 'around \$US40m' but this is just the Average Unit Fly-Away Cost (UFC) based on a production run of somewhere over 2500 units. In other words, this is the anticipated cost to build an aircraft after the first 1250 have gone down the production line. Defence is keeping the actual costs a closely guarded secret even though detailed cost models from the manufacturer do exist.

At this point in its development, the costings for the JSF are somewhat problematic and 'rubbery', given the levels of risk and unknowns in such a large program. However, an indication as to what the Department expects can be derived from the following, simple calibration check:

NACC Median Budget = \$A13.5bn (as per the DCP).

Numbers of JSF Proposed = 100 units  
(including attrition aircraft).

Budgeted price on a per-unit basis = \$A135m per unit

This latter figure is what would be referred to as the full IOC Procurement Price plus infrastructure costs (ie. hangars, etc), amortised on a per-unit basis. So where does the 'around forty million dollars' figure come from?

## The force mix option

A comprehensive capability analysis was provided to the Department from Industry in 2001. A short summary of this may be found at <http://www.ausairpower.net/TE-F-111-Supercruise-2001.html>. Based on this analysis, an appropriate force mix force structure was derived using the Raptor and improved F-111s. This involved the proposed acquisition of 50 F/A-22 aircraft (with an additional 5 for attrition) and 36 Evolved F-111s (notionally termed the F-111S), engaging Australian Industry to do the upgrades.

This is demonstrably a more comprehensive, balanced and potent force structure than the JSF option.

The cost of developing a force of 36 Evolved F-111S aircraft is around \$A1bn. This would be phased over time so would not strain the DCP. Further developing and sustaining the Australian aerospace industry base would be one by-product of such a 'Buy Australian' Initiative.

In financial terms, such an option is based on the median NACC budget of \$A13.5bn above. With the procurement of 55 Raptors, around \$A3.6bn would be left (on the basis of 20 x \$A180m). This figure would vary depending on how well Australia negotiated the purchase of such a capability from our closest ally. However, given the mounting strategic pressures in our region, Australia having 50 F/A-22A aircraft and retaining its long-range strike capability would be seen by all our allies as a valuable contribution to the maintenance of regional stability.

Some of this \$A3.6bn 'acquisition surplus' would be used for infrastructure and introduction into service costs (over and above the IOC Procurement Price). The bulk of this surplus, along with the remainder of the \$A15bn NACC budget, could then be used for provision or upgrade of other much-needed defence capabilities, such as network strengthening and hardening the Army, without necessarily needing to increase the overall defence budget.

The other thing to note is that if the USAF acquires the 381 F/A-22s it seeks for its expeditionary force structure, Australia having 50 units would make us a significant part of the world fleet. This is a position of strength and influence Australia has never been in with any new capability.

Another aspect to consider is the opportunity for commonality of systems (radar, cockpit, weapons systems, etc.) and, ultimately engines, between the F/A-22 and the Evolved F-111s. With regard to the engines, using a variant of the F/A-22A's F119-PW-100 provides a cost effective solution which would enable the F-111 to achieve supersonic cruise (around Mach 1.4, perhaps even higher). Supercruise much improves survivability and makes an aircraft a lot more productive in roles such as Strike, Close Air Support and cruise missile/bomber interdiction.

## Implementing the alternative

The F/A-22A is a real aircraft, flying today and in full-rate production. Based on current production rates, Australia should be looking at buying this aircraft towards the end of the current approved full-rate production run.

By that time (around 2008-09) the F/A-22A will be operational in the US Air Force as their Tier-1 Air Dominance Strike Fighter. It will have far more capability and be a far more cost effective and productive platform than any of its rivals, including the JSF, which will still be in SDD and low-rate initial production. Current plans for the JSF Program do not have it coming up for full-rate production approval until some time after 2013, making it a developmental aircraft until that time.

What has been proposed with the F/A-22A and F-111S force mix 'system of systems' option is a solution which provides better 'bang for buck' than the current JSF option. The F/A-22A is true Tier-1 capability in all areas, particularly where the JSF is not likely to perform strongly. This alternative solution also provides lower risks, lower costs, greater capability, a robust Industry development model which is controlled by Australians, and the opportunity for timely introduction of advanced capabilities. The force mix option avoids any capability gap which, on current plans, is looking like it will be of chasm-like proportions after 2010, if not earlier. On a financial basis, the force mix option also negates the need to spend the \$A4.5bn or more required by current plans, in their attempt to fill the gap out to 2015 if the F-111 is retired early.

Our focus should be on providing Australia and future generations of Australians with the best air combat capability our nation can afford. Our current involvement in the SDD Phase of the JSF Program should also continue for reasons to be covered in a separate article. These primarily rest in issues of Industry engagement, technology transfer and capability development. But they also include our ability, given the unique skills and assets we Australians have, to assist in the mitigation of some significant risks in the overall JSF program. ♦

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