Submission No 22

Inquiry into Australian Defence Force Regional Air Superiority

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The Honorable Bruce C. Scott
Chair, Defence Sub-Committee
Joint Standing Committee on Foreign Affairs and Trade

A Submission to JSCFADT Inquiry into Australian Air Superiority

Dear Mr Scott,

I am a retired RAAF Group Captain with 34 years of service. I have some combat experience in fighter operations, some staff exposure and a significant amount of military flight testing experience. I am qualified on 69 different aircraft types and have spent two periods totalling five years as Chief Test Pilot of the RAAF. I accepted the first F-111C for the Australian Government on 05 September 1968 at General Dynamics, Fort Worth, Texas.

Subsequent to my RAAF service, I spent 14 years in high technology organisations dealing with satellite systems, radars and communications systems.

I have watched the build of submissions to this Committee with growing concern over not only the variation in standards and depth of knowledge, but more importantly, the subtle shift of emphasis on some issues. I decided to make this submission to highlight these aspects.

At the outset, I do not propose to write on issues that have already been covered, either adequately or largely satisfactorily. I have studied all the Submissions (except #17) carefully, and I wish to state that I give my unequivocal endorsement to the content of Submissions #3, #9, #16, #20 and #21. Further, I support the general thrust of the statements and opinions contained in Submissions #6, #7 and #19.

The issues of emphasis I wish to bring before the Committee follow.

1. The assets required for covert, long range strike capability. You will be aware there is a very large body of expert opinion that holds the F-111 to be ideally suited for Australia's defence, being able to project a very significant potential threat towards any likely adversary. In a hypothetical situation, for example, a single F-111C aircraft can deliver an 8,000lb weapon load (4x2,000lb stores) with precision against a maximum range target, maintaining high subsonic speed during ingress and egress.

The use of the F-35 to achieve the same result will require a minimum of two such aircraft, with the support of one Wedgetail AEW&C and one A330 tanker. Additional F-35 aircraft may be required for protective fighter escort. This package of high value assets must

proceed towards the target to the point where the strike aircraft can continue alone. In practice a backup tanker would most likely be needed as insurance against refuelling mishaps, and this, in turn, may require further fighter support.

In summary, to replace the capability of a single F-111 requires an impressive armada.

The further implications of this are addressed at Issue 4.

The mission rules could, of course, be changed and have the F-35 element employ standoff weapons. This would reduce exposure to the F-35 force but could involve an increase in cost of weaponry by a factor of 20 or more, depending on the weapons used.

2. The F-35 as a Stealthy vehicle. Information readily available shows the F-35 is optimised against X-band radar in the forward sector. X-band is in common use, frequently employed in fighter air interception radars and surface to air missile defence engagement radars. Despite the incorporation of saw tooth patterns into the afterburner nozzle, the F-35 will retain a very significant radar cross section when viewed from behind, especially in the lower bands used by search and acquisition radars.

The F-35 is not at all optimised for air to air combat, and this is particularly so if the adversary is any of the current Russian Sukhoi fighters. This has been explored in other submissions, but is essentially a function of the limitations of the wing planform and the agility available from the thrust to weight ratio resulting in part from fixed air inlets. For those who believe all air to air combat will be beyond visual range, I would remind them of the frantic evolution of the F-4E early in the Vietnam war.

Equally important, but frequently overlooked, is the fact that the F-35 ***is not stealthy at all*** *if it is configured with external stores, or opens the weapon bay doors when in the clean configuration. Without its stealth, the F35 is little more than a small battlefield strike optimised fighter, with limited performance and payload and only marginally better than the F/A-18*

3. The robustness of Network Centric Warfare (NCW) Systems. Following discussion and briefings from the ADF, one could be forgiven for forming the opinion the senior RAAF Staff are dazzled with the concept, embracing it with almost a religious fervour. I agree the concept of information distribution throughout the battle space is a tremendous advance over any previous system. While NCW should be actively and progressively introduced, it must not be regarded as the panacea and must certainly not be regarded as a substitute for vehicle capability.

What rarely rates a mention today is the effect of a comprehensive and competent jamming system that can destroy the links essential for information distribution. Our American friends are already having major problems with Link 16, since the modulation does not cope well with interference, and multipath radio propagation. The common practice of overloading Link 16 nets by multiplexing multiple channels is proving highly troublesome. The system is believed to be far more fragile than the US will admit to.

Committee Members may have experienced interference problems with digital television, where the transmission can collapse completely without warning. Such a collapse is a frequently seen feature in complex digital transmission schemes (non-linear degradation). Small amounts of interference or jamming are rejected with no effect, but beyond some threshold, the system fails to function completely. The often graceful degradation of analogue systems no longer exists. If an opponent can push the networked ‘system of systems’ past this knee in the degradation curve, we would lose NCW capability, and hence battlespace awareness.

I note the Russians have a long history (from the earliest days of the Cold War) of building very good, high power jammers, ranging from noise/ broadband through to focussed, very high power, frequency hopping systems. Russia has exported such equipment to our regional nations recently.

In the event competent jamming is active in the battle space, we could expect some networks to be cut and others reduced to a small fraction of capacity. Under these conditions, battle managers not accustomed to working with only minimal information available would find their decision processes impaired by the absence of the clear picture they have grown up to expect. Once the network collapses, or is seriously impaired, the enemy is then able to take out our high value assets like the AEW&C and tankers.

4. Opposition Weaponry. Discussion with Wedgetail personnel generally reflects a high level of confidence in their ability to survive in the battlespace. Such confidence is likely generated by the provision of protective countermeasures such as chaff/ flare/ expendable jammer dispensers, laser warning receivers, radar warning receivers, missile approach warning systems and perhaps others that I have no knowledge of. This certainly puts the Wedgetail crew well ahead of their UK and US counterparts who do not have such defensive capabilities.

The tanker aircraft are not as well placed as the Wedgetail.

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The Russians have built a series of missiles designed to defeat aircraft such as AEW&C, B-52, and tanker aircraft. These missiles are
air launched from a distance of 200 nautical miles or more and reach Mach 5 at rocket burnout, somewhere above 80,000'. At about 50 nautical miles the missile commences a 10^{o}-20^{o} dive down to the target, lighting up the active radar component of its guidance seeker at about 30 nms. Since it is a big seeker it burns through defensive jamming early. The flight time from the 30 nautical mile light up point to target impact is about 37 seconds. If the automatic defensive systems built into the Wedgetail fail to protect, manual effort would obviously be futile.

As far as the tanker is concerned, waiting to refuel the egressing F-35s, the outcome is obvious.

I believe the only viable strategy against these missiles, (such as the R-172 and R-37), is to take out the missile carrier before missile launch.

The F-35 is not adequate for this task.

There are, of course, many other issues demanding clarity, particularly concerning the F-35, but the cases 1-4 above represent some of the most important in relation to Air Superiority for Australia. From these cases, the conclusion emerges that we should continue to operate the F-111 force for as long as possible.

At this point I should note that I, together with a number of my contemporaries, have been unable to have any significant discussion on these issues with ADF officers. When attempts have been made to hold discussions with working level staff officers, it has become apparent immediately that these persons are subject to strict discipline when it comes to freedom to debate and attempts to hold free flowing discussion are frustrating. One could be forgiven for concluding there was no freedom to deviate from the approved policy line or even to query it.

As far as senior staff are concerned, there appears to be an attitude of condescending paternalism when concerns are voiced, with the party raising the issue being given a virtual pat on the head and being told, effectively, to "….trust us, we are the experts…".

I certainly do not dispute that there is an enormous level of expertise within the ADF. I believe, however, there are cases of rampant intellectual tunnel vision and the pursuit of the F-35 is probably the prime example. Why else would the ADF be seeking to acquire a

capability in 2010 or thereabouts which is already inferior in many respects to the air superiority assets now being introduced in service in the countries to our North ?

I believe, Sir, your task is an unenviable one. I wish you well.

Yours sincerely,

(R.G.Green)