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Submission to: The Foreign Affairs, Defence and Trade Committee
Australian Senate
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Canberra ACT 2600
Transmitted by email to: fadt.sen@aph.gov.au

Subject: The Planned Acquisition of the F-35 Lightning II (Joint Strike Fighter).

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1. About the Author: Marcus Kollakides is a primary producer and also proprietor of a web based business for rural services and products. He has a degree in political science and international relations with special interest in defence as it affects the shifting balance of power in the Asia Pacific.

2. Executive Summary:

This Inquiry into the F35 acquisition would not be necessary happening had the original F35 order been subject to proper process or sound governance. At the RAAF level, the conflict between towing the Government line to favour the F35 versus the realisation that this aircraft will place its pilots at unacceptable risk in combat, is a crisis which cannot be admitted. This submission does not however focus on the master and servant relationship which led to Australia's failure to conduct due diligence in the selection of the F35, but rather on its dire consequences.

Both the selection process and the aftermath pressure to misrepresent the F35 somehow fit for any of the roles for which it is claimed to be able to fulfil, do demand though, a complete rethink of how the mediocre manner in which the Australian Defence acquisition community have mismanaged the analysis of the F35 and the worst failure in strategic planning since we were placed into a similar position in the lead up to the attack on Pearl Harbour and soon after on Darwin.

The rescue task confronting Australia now is a matter of imperative to simply cancel the F35 now, or if necessary to go through the motions and conduct an urgent to competitive evaluation including fly offs against other aircraft, and then cancel the F35 and buy a different and superior aircraft. This latter point being crucial to understand that we have been doubly misinformed. Misinformed that the F35 is capable of doing what its proponents claim it can do, when in truth the aircraft is a fraud. And then misinformed or deceived again, that somehow there are no alternative and superior aircraft to choose to purchase. There are in fact at least two superior alternatives.

Reform of the Defense acquisition establishment is essential to our national security and the necessary cancellation of the F35.

3. Introduction

- **The RAAF promotes the myth of F35 capability.**

" The F-35A Lightning II will provide for Australia's future air combat and strike needs."

(<http://www.airforce.gov.au/Technology/Future-Acquisitions/F-35A-Lightning-II/?RAAF-ZRnYQhJUh1u0e44uR32oIoT1rt+Ym4K3>)

In this bold opening to the [airforce.gov.au](http://www.airforce.gov.au) website, the RAAF is half right. Yes Australia will have future air combat and strike needs. And no, the F-35A Lightning II, is never going to be capable of providing for those needs.

One has to hope the RAAF leadership is not utterly incompetent and the support it lends to the F35 is only caused by political pressure to support the (failed) F35 cause.

We tend to take for granted that Australian national security, since WWII, all with it, our stability and prosperity and safety, has been built on air superiority. The same has been true for all members of the Western alliance. The rise in recent years of the economic and military power of our regional neighbours and the concomitant rise in tensions concerning undersea and other valuable resources have been all too obvious. Territorial claims already extend to gunboat diplomacy. Many of our regional neighbours in the Western Pacific and Indian Ocean can now afford to purchase and are already acquiring the ability, to shoot the F35 out of the sky. This does put our national security at stake. The F35 be it the A model, or the B or C model, is falsely claimed to be a multi role fighter. The truth is that it cannot perform any role well. The paramount role of air superiority being furthest from its capability.

A step-by-step analysis of the F35 reveals its many failings.

F35 performance standards have been progressively lowered to allow it appear successful.

The F35 project itself is said to be too costly to cancel. Politically in the USA the F35 components are made all over the country. Even in Australia to induce us to buy, we were tossed a few bones to make some parts here. These job creating pork barrels will be of no value to a pilot in combat.

Our trade and prosperity are tied to China. The F35 cannot survive in a hostile environment against existing Russian SU Flanker aircraft or current Chinese fighters. Russian fighters are already in the Indonesian Air force. The position will only worsen as those countries roll out their PAK FA and Chengdu fighters, many of which

will have export orders to other countries in our region and which are purpose built to destroy the F35.

4. Surely all Great Aircraft start out with a few Bugs ?

Yes they do, but the critical factor is always the starting point, the basic design. A fundamentally good aircraft can have its bugs ironed out. A badly designed aircraft, no matter how good the add on systems are, still remains a bad aircraft.

Australia has previously ordered a high tech aircraft and once the bugs were ironed out, it did become a first class aircraft. The F111 supersonic bomber was such a success.

The F35 cannot be compared however to the F111. Cutting edge technology as it was at the time, the F111 started out as a brilliant design for one mission above all else. To be unstoppable as a supersonic low level attack bomber. One mission for which it was purposefully designed and for which once it has its bugs ironed out, it was an unrivalled success.

The F35 is the opposite. A bad and fatally compromised design from the start, hopelessly compromised to be so multi role that it is sub standard at any role.

To understand the falsity of such excuses and comparisons made on behalf of the F35 joint Strike fighter however one must look at basic design. The F111 was a brilliantly designed single purpose aircraft with variable wing geometry, two powerful engines and all the basic ingredients for success built into its shape and engine capabilities. Put simply, this meant that all the sophisticated radars, weapons and avionics etc. fitted to it, were in fact being fitted to the fundamentally excellent design of the F111.

Unfortunately the same cannot be said for the F35. It is fundamentally a bad flying machine, with a bad wing, a poor and only single engine and compromised shape, which can only slightly fulfil its so-called 5th generation stealth claims. The F35 may well have an advanced pilot awareness helmet with electronic networking to other assets, but the fact remains no matter how good these add ons are, they are being fitted to an inferior aircraft. It demands an answer of a simple question. If these add ons are so good, then why not fit them to a fundamentally well designed good aircraft rather than the inferior F35 ?

5. About the F-35 Joint Strike Fighter.

The F35 cannot hide, cannot run, cannot win.

This is an aircraft whose supporters adopt exactly the same and proven to fail policy of the US during the Vietnam War. US F4 Phantoms started out there with no guns and would not need to dogfight in visual range (VR) , because supposedly they would defeat Russian MIGs beyond visual range (BVR) with their supposedly superior US air-to-air missiles. The result was a (US) disaster and hasty changes had to be made. That lesson was learned and for nearly 40 years US planes were built to win in VR or BVR. From far away and close up. But now that lesson has been forgotten with the F35 and once again we asked to believe our gadgetry can make up for the bad plane which is the F35 and somehow it will prevail without ever coming close to or being seen by an opponent. The evidence says otherwise.

6. What are the Basics of a Fighter Jet ?

It starts with a fuselage with wings and one or more engines. Then come the add-ons such as avionics, and weapons.

Fuselage: The F35 has a compromise fuselage downgraded from the original prototype to accommodate the B version requirements for a lift fan. The fuselage skin is thin and vulnerable to ground fire in the event the aircraft is tasked with providing close air support to our ground forces. The downgraded (from stealth to partial stealth) fuselage shape results in inadequate internal weapons carrying capability or complete loss of stealth if extra weapons are carried externally.

In uncontested airspace where the F35 might be tasked to provide close support for ground forces, the thin skin of the F35 renders it highly vulnerable to small arms ground fire. This supposedly all-purpose aircraft is not fit for combat, of any mission type.

Wing: The F35 lacks the manoeuvrability of competitors with close-coupled canards ahead of it. The main wing has a high drag coefficient, poor lift and bleeds energy turning and climbing.

The F35 wing is a poor compromise wing intended to serve its purported multi role capabilities. The result is the F35 lacks the high manoeuvrability of competitors, can't evade beyond visual range incoming missiles, can't turn to save itself in visual range dogfights and together with the poor engine performance can't climb fast enough or reach dominant altitudes to match the competition.

Engine: The Pratt & Whitney F135 engine with its current 43,000lbs max thrust is inadequate will remain so even with the planned 2019 block 6 engine upgrade. Although powerful, this engine is pushing an overweight and badly designed fuselage and compromise wing, which came out of the compromise to try and build an all purpose fighter which in the end can do all things but nothing well. For performance and reliability and to have some chance of survival if an engine fails or is damaged, the single engined F35 is inferior to its twin engined competitors.

In the case of the F35, it has the vulnerability of just one engine and is inadequate to match much less to defeat the competition.

The F35 engine cannot supercruise like its faster competitors. So the F35 has a much shorter range than a Sukhoi. When the F35 runs out of its limited weaponry or its small fuel load and it seeks out an airborne and highly visible non stealthy refuelling tanker or when it turns for home and exposes its heat signature, then any loitering enemy aircraft will have fuel, weaponry, higher altitude and superior speed to easily run down the basically defenceless F35 and kill it.

Scoring the Field: (Source Airpower Australia)

	US F22 Raptor	Russia T50 PAK FA	China Chengdu J20	F35 Joint Strike Fighter	Current Russian SU35 4th gen ++ Fighters
Super Cruise	Yes > mach 1.7 (0)	Yes mach 1.8 (0)	Yes (0)	No (-1)	Yes (0)
High agility super / sub sonic	Yes (0)	Yes extreme (+1)	Yes (0)	No neither (-1)	Yes extreme (+1)
High specific excess power	Yes (0)	Yes (0)	Yes (0)	No (-1)	Yes (0)
Thrust vectoring	Yes 2 D (0)	Yes 3 D (+1)	Yes accommodated 3 D (0)	No (-1)	Yes 3D (+1)
Highly integrated avionics	Yes (0)	Yes (0)	Yes (0)	Yes (0)	Yes (0)
Electronically	Yes high	Yes high	Yes (0)	Yes but only	Yes high

steered array radar (ESA)	power aperture (+1)	power aperture (+1)		medium powered aperture (0)	powered aperture (+1)
Side looking ESA apertures	Fitted for but not equipped with (0)	Yes (+1)	Unknown but expected.	No (-1)	Yes (0)
High situational awareness	Yes (0)	Yes (0)	Likely (0)	Yes (0)	Yes (0)
Supersonic weapons delivery	Yes (0)	Yes (0)	Yes (0)	No (-1)	Yes (0)
Large thrust to weight multi engine thrust growth	Yes 2 engines large thrust growth (0)	Yes 2 engines large thrust growth (0)	Yes 2 engines large thrust growth (0)	No only 1 engine with poor thrust growth (-1)	Yes 2 engines with large thrust growth (0)
Look down shoot down high combat Ceiling Loiter / Operate (plus > 7 deg/sec turn rate, sustained @ 30 kft)	Yes > 55,000ft (0)	Yes > 60,000 ft (0)	Yes > 50,000ft (0)	No < 50,000 ft (-1)	Yes > 55,000ft (0)
Stealth or very low observable	Yes all aspect (+1)	Yes All aspect or Partial (0)	Yes All aspect or Partial (0)	Yes but only partial (0)	No (-1)
Good non RF observables	Yes (0)	Yes (0)	Yes (0)	No VOVS/WVE (-1)	No (-1)
Large internal usable fuel load	Yes > 18,000lbs plus thermal cooling (0)	Yes 22,000lbs plus thermal cooling (0)	Yes 25,000lbs plus thermal cooling (+1)	No < 18,000lbs and minus fuel for thermal cooling (-1)	Yes > 23,000lbs (+1)
Internal weapons carriage hard points.	Yes 6 + 2 (0)	Yes 6 + 2 (0)	Yes 6 + 2 (0)	Yes 4 (0)	Partial (Tunnel pod) 2+4 (-1)
SCORE by 5th Gen Metrics	+2	+4	+1	-10	+1

7. Deterrent Effect of Air Superiority.

Up until now any potential adversary of Australia has been deterred from war or conflict because of knowledge or doubt they could prevail in the air against us.

The F35 would reverse that view and a potential adversary could be very confident of defeating the RAAF, thus making conflict much more tempting even likely.

8. F35 Not Stealthy:

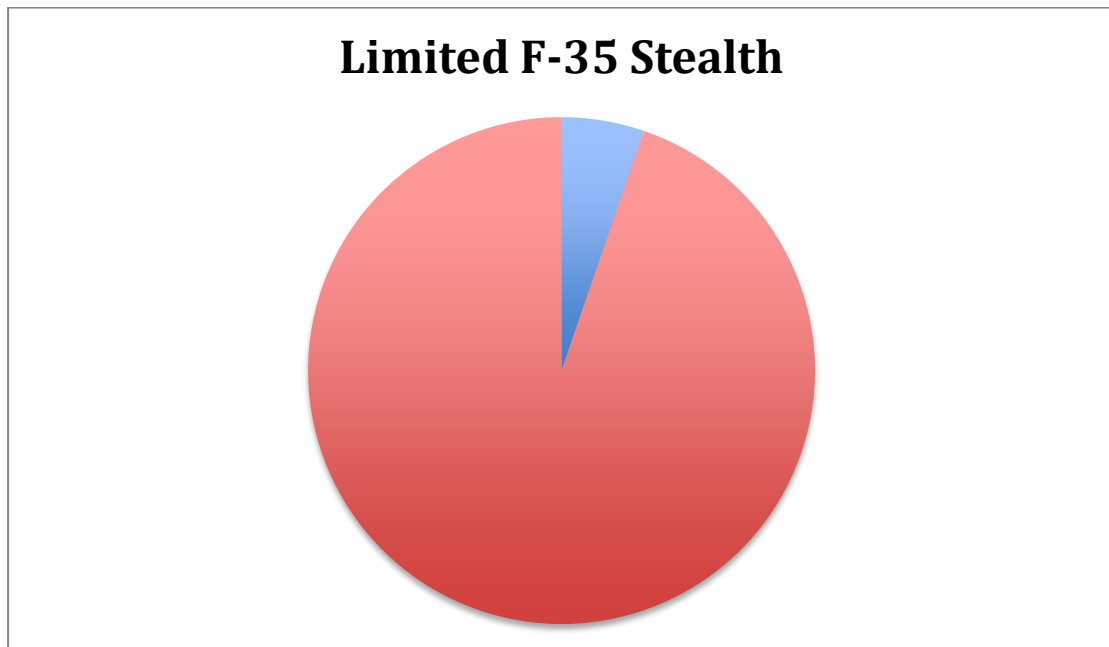
The F35 is not the stealthy original Lockheed Martin X35 aircraft which was awarded the US contract over the Boeing X32 in the contest to decide which company would build the Joint Strike Fighter for the US Air Force.

The underbelly of the F35 is a downgraded redesign of the more stealthy X35. The result is that the F35 is not a true "stealth" aircraft and at best can only hide from some, not all, Russian radars, and only then when searched across a tiny 19 degrees of the head on position. For the other 341 degrees of the horizon, the F35 is easily located, targeted, attacked and destroyed. New Russian and Chinese long wave radars already come close to defeating stealth technology.

Even without these new radars however the pie charts below illustrate the F-35 partial stealth problem. To evade detection from head on the F35 has stealth across only 19 degrees (5%) of horizon. Therefore for any enemy in the 95% of sky not head on to the F-35 it is visible and vulnerable.

The F-35 cannot remain stealthy outside its 19 degree head on angle of approach to an enemy. Simple triangle geometry reveals the simple and effective enemy tactic, which will defeat the F-35. Oncoming enemy aircraft even at 100 miles range, will need only fly 33 miles or about 5 minutes apart, to ensure they are outside the F-35 stealth zone and attack and defeat with their longer range and multiple missile types. An important point to note here that the F-35 systems can evade or defeat many of the individual enemy air-to-air missiles but it cannot simultaneously defeat multiple different types of enemy missile. Which is exactly what aircraft like the heavily armed SU-35 and PAK50 are equipped to carry and launch simultaneously, multiple different air-to-air weapons, such as an active radar homing missile together with an infrared seeker. Against which salvo the F-35 cannot survive by any means, be it jamming or outmanoeuvring or outrunning. The f35 may avoid one type of missile but the other will knock it out. Enemy systems like the SU-35 are purpose built to destroy the F-35. Indonesia is building up its fleet of SU35's now and are expected to have more than a 2:1 numerical advantage over Australia's planned 72 fighters and each Indonesian fighter will have twice the combat range of the F35. The result will be forced air to air refuelling of the F35 from our

non-stealthy air tankers and like lions waiting for zebras to inevitably gather at the waterhole, it is logical to expect the F35's will be targeted during refuelling.



9.



9. Hope US F22 Raptors protect our F35 Joint Strike Fighters

For any recalcitrant who would claim that US Air force F22 Raptor fighters would come to our aid we must ask why we are seeking to buy the world's most expensive and ridiculed fighter plane if it then needs to be protected by other planes from the US ?

The F22 was produced like a badly fitting jig saw puzzle from around 46 States from 1996 onwards. Reliability is not an F22 strength. Of the 187 produced only about 122 are thought to be currently airworthy and for those around 13 hours in the maintenance shop are required, for every one hour spent in the air.

Coming through the very same pathway the F35 quality control is already proving to be just as bad.

In any event the F22 is soon to be matched and probably overtaken by Russian and Chinese aircraft including the PAK FA.

US war planners openly state they will need all the F22 Raptors they have to clear the skies for their own F35's. No more F22's are to be built, none are available for export sales and none appear likely to be available to come to the aid of any F35's we might be foolish enough to purchase

10. Weapons.

The F-35 carries only limited weaponry. To preserve even its limited stealth, it can only utilise 4 internal weapons hard points (mounts). Using the 6 external hard points renders the F-35 non stealthy and visible to radar.

The fact that Russia and China are both deploying now, the S400 area denial surface to air missile system means that the F35 will not be able to enter the battle space. The S400 is almost immune to electronic warfare countermeasures or jamming and has been described as throwing an "iron dome" over its theatre of deployment.

To counter the assertions that the F35 need not dogfight (because it can't) as that it will somehow destroy an enemy beyond visual range (BVR) is also given the lie when one considers that the F35 radar although sophisticated is underpowered and it can only defend effectively against one type of threat at a time. Which is no counter the Russian and Chinese air battle doctrine of designing heavy lift heavily armed twin-engine fighters such as the Sukhoi flankers, which can fire salvos of multiple types of weapons from great distances at the hapless F35. The facts that the Russian radars are more powerful than the F35, that their long wave bands overcome the partial stealth of the F35 and critically that even the planned newest generation of air to air missiles for the F35's will be completely outranged by Chinese and Russian air to air missiles already coming into service such as the R77 evolution missile, is a fact which seems to have gone unnoticed by advocates for the F35. Even the promised 180km BVR range of the latest Amraam Aim 120D will be severely outranged by the latest Russian and Chinese air to air missiles fielded by the MIG Fulcrum, Sukhoi Flanker, Chengdu and PAK FA, 4th ++ Gen and 5th Gen fighters which the F35 would have to face.

It is not simply that the West has been overtaken by Russia in missile terms but we do not even have a catch up weapon on the drawing board yet. Even if we did have such a long range, jamming resistant missile the F35 problem is the compromised fuselage design which means it could not fit such a weapon into its concealed weapons bay. Alternatively to hang such a larger missile out in the open on one of the F35 under wing mounts, would immediately render even its partial stealth qualities null and void and the F35 would be attacked and destroyed even more readily by an enemy combatant.

11. Nothing Can Fix the F35.

There is no room for a more powerful radar or more and larger weapons in the stealthy concealed weapons bay.

The single engine might be replaced if a new more powerful one is built but it will still remain just one engine leaving the aircraft with no engine redundancy in the event that its thin skin is penetrated or the lone engine develops a fault in flight.

The sensitive stealth coatings of the fuselage will continue to require high levels of maintenance and the current stated minimum range maintenance required, 9-12 hours in the workshop, for every one hour of flying time, is at best, an optimistic hope.

12. Scenario of Highest Probability

It is widely accepted the F35 cannot win a close encounter dogfight. Neither is it true to say the F35 could destroy its enemy at beyond visual range (BVR). The plain fact is that the enemy already has more powerful radars that can see the F35.

They can fly higher and faster than the F35 and for longer with many more and longer range weapons. By flying a few miles apart they easily obtain the angle to see the F35 before it can see them

The enemy will fire a long range salvo of a mix of sophisticated jam resistant air to air missiles against **the F35 which will be:-**

- Too far away to fire its own weapons.
- Trying to jam some of the varied types of incoming missiles.
- Slowing down to subsonic to be able to fire back.
- Tracking the remaining incoming missiles it cannot defeat.
- Lacking lift from its compromise wing shape.
- Lacking power from its single engine
- Unable to perform last ditch evasive manoeuvres because of no close coupled canard winglets and no thrust vectoring.
- **Destroyed.**

The following 10 minute video produced the US Air Force Association itself, amplifies and confirms the above has been developmentally in train for a decade and that the outlook for the F35 is not improving but deteriorating.

<https://www.youtube.com/watch?v=VnnMNF-UKxE>

13. Are there superior alternatives to the F35 ?

Yes, there are superior alternatives.

If we accept the reality the F35 has already lost its first shot capability and that even Indonesia will be off limits to the F35 then 4 excellent alternative aircraft are available now and a fifth one is in development and which we would be well advised to consider partnering. The wise course of action is to cancel the F35 order and purchase two other and cheaper more effective aircraft for our specific needs

13(a) The First Choice:

Purchase an air superiority fighter which given our limited means, has some multi role capability.

Three excellent aircraft from countries in the Western Alliance are available now.

- The single engine SAAB Gripen Next Generation (NG).
- The twin engine Eurofighter Typhoon.
- The twin engine Dassault Rafale.

All three planes are fourth generation ++ fighters to the extent they (together with advances in Russian and Chinese long wave radars) render so-called 5th generation stealth ineffective.

All three planes have close-coupled canard manoeuvrability which the F35 lacks.

All three planes have powerful networked avionics, combat systems and radars the equal or better than the F35.

All three planes are war gamed to defeat the F35 and potential adversaries like the Russian Sukhoi.

All three aircraft have very low observable (close to stealth) capability and all three have excellent beyond visual range strike capability.

All three aircraft have far higher build quality than any American fighter such as the F35 or F22, as evidenced by their far lower requirements for maintenance as expressed in ratios of flying hours, to in the workshop service times.

The SAAB has the advantage of being able to land and take off from roadways, which would be a valuable capability if our scarce northern runways were attacked. In the other hand it is a small fighter with only one engine, which like the F35 makes it vulnerable to reliability or battle damage concerns.

The Eurofighter Typhoon is probably the world leading dogfighter and air superiority fighter, possibly just inferior to the F22 Raptor, if and when the Raptor is not in the workshop for maintenance.

Similarly the Dassault Rafale is a brilliant dogfighter, so close to the Typhoon in ability it is difficult to call. Where the Rafale shines is that not only does it possess all of the above qualities, it has exceptional strength and design features which lend themselves to multi role capabilities above and beyond the Gripen or Typhoon.

Another advantage of the Rafale being that we would re-establish our successful relationship with Dassault, from when we flew the highly successful Dassault Mirage fighters.

Although obviously this Submission is dealing with the need to cancel the F35, whilst noting there would need to be an evaluation of alternatives, this brief synopsis points to the fact the F35 need not be purchased for want of an alternative, because the RAFALE would meet or exceed all the requirements for Australia, notwithstanding the fact that the RAAF has the bad habit of answering its own question about what is the sexiest plane it would like to have, and then formulating a set of "requirements" in such a way that only the plane it is in love with can qualify. Such considerations would likely be cast aside if the RAAF pilots found themselves in a jet like the Rafale with could actually defeat the enemy rather than in an F35 which is most likely to result in a swim home.

The geo political advantages of buying European for the bulk of our fighter force and keeping clear of being dragged into another questionable regional conflict, via the "tilt to the Pacific" or otherwise, are sufficient to fill a book and probably best not gone into publicly here or elsewhere. Suffice to say we know who our most important new trading partner is and that if we do not go looking for trouble then they will be unlikely to bring it to us,

leaving aside the dangerous practice embarked upon of us hosting foreign forces in our North.

What we do need and need now, is a fighter to protect our sea-lanes, approaches and offshore assets against near to home threats. The F35 will not be up to the job and for an aircraft that is anything but a bargain it should be up to the job and not plagued with "bugs" to be ironed out, with the certainty that even if they are ironed out it will still be a bad plane with some good gadgets.

The Rafale on the other hand would be up to the job for many years to come and at the right price

13 (b) Force Structure Problems Affecting our Aircraft Choice.

To consider the 4th type of aircraft available to purchase now it is necessary to consider the aggravating obsolete structure of our Defence Forces.

Anyone from an Ancient Roman General to a modern day US Marine Corps Commander would wonder why when a force structure numbers only in the tens of thousands, such as our ADF, why we operate three distinct Services instead of one integrated battle group. Unless of course one appreciates the humour encased in (sadly) the documentary quality analysis found in *Yes Prime Minister Series 2 Episode One "Man Overboard"* when the PM tries unsuccessfully to persuade the Field Marshal that the army should move 'up North where the threat will actually come from.'" No no, the Field Marshal replies, its too far from Wimbledon and Harrods.

So it is with the Australian Defence Force. Top heavy with chiefs and not enough indians. Why we have not merged the ADF into an Australian Marine Corps defies common sense. Something is wrong.

Australia ranks as:-

- 12th largest economy (sources IMF, UN and World Bank)
- 14th largest defence budget.
- 20th most powerful military.
- Indonesia ranks 19th militarily. (Source: Business Insider)

Australia's Defense staffing inefficiency ratio and our poor bang for the buck is obvious and sick. It underscores our failure to comprehend that neighbours like Indonesia, with less money, already field the Sukhoi fighters which can knock out the F35.

13(c) How does ADF Force Structure affect our decision about the F35 ?

The answer is inter service rivalry.

Years ago Australia placed orders with Navantia of Spain for 2 ships, which have just come into service, the Canberra Class Landing Helicopter Dock Ships (LHD's). These ships are aircraft carriers in all but name. They turned out to be the most cost effective purchases, on time, on budget and almost bug free purchases in the history of Australian defence acquisitions. We have never got so much flexible bang and utility for our bucks.

But these ships had one major problem we were not willing to face. Which branch of the ADF would have the glory of flying the fast jets they could carry. Would it be the old way and we resurrect the RAN Fleet Air Arm ? Or would the RAAF show offs get the nod ?

So while this argument went on, we ordered the ships with the ski jump for jet take-offs, but having an each way bet as we often resort to, these ships would be without the few extra dollars necessary to provide fuel and stores lockers to provide for the jets. Laughably we are now told by Defence Force spokespersons that "it would have *cost more* to order the ships *without* the ski jumps for jet take-offs". As if it would cost more to build a one-storey house than a two storey. Enough said.

The reality was that our own forces inter service rivalry meant we placed a tentative order for the worst performing version of the F35, the B model, which has short take off and vertical landing (STOVL) capabilities.

With these F35 B model jets we were told our troops would have the benefit of close air support and vital fighter cover in the skies above. The F35 B would go aboard our Canberra class ships to bring them up to the same level as their sister ship, the *Juan Carlos* ship of the Spanish navy with its compliment of Harriers.

We were also told that with the F35B's would give us fleet protection therefore we could send these ships on missions without the benefit of having their own anti aircraft missile defences on-board. When that explanation was greeted with derision, the ADF changed tack and claimed the new Air Warfare Destroyers (AWD's) would accompany the LHD's and protect them against air attack. Argument just reached stalemate. If one accepts though that the AWD argument has some merit though, then the focus must come back to the ships and the complete lack of fighter protection for the

fleet or any troops embarked ashore. The very mission these ships were built for.

And these LHD ships or aircraft carriers without aircraft if you like, are the very devil in the minds of some in the Defence establishment. For they are the embodiment of efficiency and integration. They bring together, the medical corps in the ships hospital, the army with its battle tanks and troops in the amphibious dock, the air force on the flight deck and the navy commanding the ship from the bridge. The Canberra class LHD's are in effect a floating blueprint of how to create a single integrated force structure battle group. And many Defence people for the sake of their own careers would not want to those efficiencies spread out into reform of the whole ADF chiefs and mandarins.

So we cancelled the F35 B model and put a few helicopters on board.

But whilst cancelling the worst of the F35 variants, the B model, was wise, it did not resolve the need for a jet fighter for these ships and the troops they are required to protect. There is however one plane which is purpose built and combat proven to be up to the job.

13(d) The AV-8B II Harrier.

This is not, repeat not the old aircraft which the UK sent to the Falklands, as highly successful as that first Harrier was.

The US Marine Corps, which is probably the worlds most successfully integrated force structure, comprising air land and sea forces, commissioned the Boeing corporation to build a new Harrier. The result was the AV-8B II Harrier. This aircraft provides fleet protection for the Marine's equivalent of our Canberra class LHD, the Wasp and America class ships and crucially as the Marines 'go in first' it is specifically designed to provide troops on the beach-head with close air support.

The AV-8B II Harrier is in service now with NATO countries such in the Italian Navy and the Spanish Navy as well as with the US Marines Corps. The US Marines want to keep it flying until they are forced to accept the F35B as its replacement.

This completely redesigned Harrier has a new fuselage and airframe, just a single but exceptional Rolls-Royce F402-RR-408 (Mk 107) vectored-thrust turbofan jet engine and a host of weaponry, night attack and advanced radar features which make it

an exceptionally capable aircraft now and for years to come. It is capable of flying up to Mach one carrying more weaponry than the F35 and it can launch its missiles at the same speed as the F35.

Twenty of these aircraft and spares could be purchased from the US Marine Corps at bargain basement prices. 16 to be embarked upon our LHD's (8 on each ship) and 4 spare aircraft kept ashore in reserve. The force multiplier effect of these Harrier AV8 B II's for fleet protection and support of our troops ashore would be incalculable. The fact that we will shortly have the Air Warfare Destroyers to augment the Harriers ability to defend against enemy jets is simply a fortunate confirmation of their worth.

13(e) The Fifth Aircraft. Our Further Future Choice.

We probably should not purchase Japans Soryu class submarine copy of the premier stealth submarine in the world today, the German U 216 class. But Japan is a valued trading partner and ally intent on building something better than the US F35 Joint Strike Fighter or F22 Raptor. Accordingly Japan is developing the Mitsubishi ATD-X Shinshin, which would be the worlds first 5th Gen ++ stealth fighter.

This ATD-X aircraft will be a generation ahead of any European, Russian or American stealth fighter and would come into service around 2030. The timing will be ideal to retire the Rafales.

If it makes sense to scrap the F35 and acquire the Dassault Rafale now, it makes even more sense that for the sake of our national security and to re-acquire our strategic security in aerospace development by making a Heads of Government approaches to the Government of Japan for us to joint venture with them in the development of this advanced aircraft.

14. Recommendations.

- I. Competitively Evaluate then Cancel completely, the F35.**
- II. Purchase 75 Dassault Rafale fighter jets.**
- III. Purchase 20 refurbished AV-8B II Harriers.**
- IV. Negotiate with Japan to joint venture the development of the ATD-X Shinshin.**