

## Submission to Senate Inquiry on the Joint Strike Fighter (F-35A)

### Introduction:

Recommendations by author are supported by irrefutable evidence from DOTE annual report 2015 and by statements by senior Pentagon officers to U S Congress on the state of the F-35 joint strike fighter project.

The following recommendations are entirely those of the author and no one else. Author has been analysing defence projects for more than forty (40) years of many Western nations and has made many submissions to Secretary of the Department of Defence and Ministers of Defence over several decades. Too many defence projects have been over time, over cost and failed to deliver the expected performance in the Western world.

Author has been scrutinising the Joint Strike Fighter project from its inception in 1996 (X-32 and X-35 aircraft) from a independent, cost conscious, technical viewpoint. Author made his own submission to the Department of Defence regarding the 2015 defence white paper which provides recommendations to build a strong Army, Navy and R.A.A.F. at minimum cost which is in stark contrast to the 2009 and 2013 Defence White Papers.

### Recommendations to Senate Inquiry on the Joint Strike Fighter by author:

- (1) NO more F-35A's to be purchased until the many hard to fix problems with the F-35A are fixed and the F-35A is made fully combat capable with Block 4.1 to 4.2 software and all its weapons operational with the F-35A. (Read DOTE 2015 annual report)
- (2) (2) F-35A to be flown over Darwin and the N.T. And W.A. during the monsoon season with lightning in the sky to determine if lightning affects F-35A performance and its overall performance in the monsoon period. (Read DOTE 2015 annual report)
- (3) R.A.A.F air bases in northern Australia such as Tindal, Curtin and Learmonth have their runways extended to allow an F-35A at full combat weight in both a monsoon and on a hot, dry 40 degree centigrade day to safely operate. Facilities for the operation of the F-35A over an extended period be constructed. (Read DOTE 2015 annual report)
- (4) F-35A is fully tested at Red Flag exercises to determine its full combat capability where all the weapons to be fitted to the F-35A are fired successfully. It is critically important to determine if the F-35A has more unknown problems which can only come to light in air to air combat and air to ground exercises against aggressor F-16's at Red Flag exercises and in over the ocean live missile and bomb drops. (Read DOTE 2015 annual report)
- (5) NO more than a maximum of thirty-six (36) F-35A's to be purchased for the R.A.A.F. starting at 2022 after Block 4 software has been fitted and proven to fully work on the F-35A and F-35A weapons are fully trialled. (Many superior alternative and supplement aircraft and weapon systems to F-35A which the R.A.A.F. never mention to Parliament)Parliament fund purchase of alternative manned and unmanned aircraft and NASAMS instead of funding 72 -100 F-35A's which are listed in this submission. (Read DOTE 2015 annual report)
- (6) **Building a powerful R.A.A.F. at minimum cost:**

**Royal Australian Air Force (R.A.A.F.) will NEVER advise Parliament about practical. Smart, low cost alternatives to the F-35A J.S.F. And the P8A Poseidon. Author has scrutinized R.A.A.F. capabilities and discovered deficiencies in many critical areas which reflects a myopia with manned aircraft.**

**Author proposes an alternative minimum cost mix to purchasing 72 to 100 F-35A joint strike fighters:**

(a) The Royal Australian Air Force (R.A.A.F.) is severely deficient in KC-30A aerial tankers and **requires a minimum of twelve (12) KC-30A's** instead of the five in service plus two(2) more on order to provide a critically important multiplier effect to its other types of aircraft. KC-30A has proven itself over Iraq in 2015 and 2016.

*Purchase five (5) more KC-30A's.*

(b) The R.A.A.F. is severely deficient in brand new 21<sup>st</sup> century jet fighters and requires a minimum of forty-eight (48) new Hornets in operation by 2018. **Twelve (12) more EA-18 G Hornets should be purchased** to provide a critically important multi-role aircraft to replace all 72 obsolete and a worn out A model Hornets from 2018 which are **NOT** fully combat capable against an Su-35 and to avoid the impending strategic gap caused by the severe delay in the F-35A Joint Strike Fighter **NOT** coming into full combat operational state until 2023 to 2025 with Block 4 software with all the weapons to be fired from R.A.A.F. F-35A's to be fully combat operational. New Hornets would be a powerful partner to the F-35A.

*Twelve (12) more EA-18 G Hornets should be purchased to be operational by 2018.*

(c) R.A.A.F. has **NO** unmanned multi-role attack-ISTAR aircraft. R.A.A.F. requires three types of unmanned aircraft to greatly strengthen its war fighting-ISTAR capabilities at minimum cost. **Purchase thirty-six (36) Improved Gray Eagle attack-ISTAR unmanned aircraft; twelve (12) Predator B Guardian for maritime patrol and maritime attack and thirty-six (36) Predator C stealthy jet powered attack-ISTAR unmanned aircraft.** Vastly lower in cost to purchase and to operate and all three are powerful aircraft with many capabilities. Joint A.D.F.-Customs use.

*Purchase thirty-six (36) Improved Gray Eagle attack-ISTAR unmanned aircraft; twelve (12) Predator B Guardian for maritime patrol and maritime attack and thirty-six (36) Predator C.*

*Anathema to R.A.A.F. because Parliament would reduce the purchase of F-35A's to a maximum of thirty-six (36) F-35A's instead of 100 as the R.A.A.F. would like; whatever the cost.*

(4) R.A.A.F. requires ten (10) NASAMS surface to air missile systems to protect northern cities and air fields and ports and Army overseas in combat.

*Purchase ten (10) NASAMS surface to air missile systems.*

*Anathema to R.A.A.F. because Parliament would reduce the purchase of F-35A's to a maximum of thirty-six (36) F-35A's instead of 100 as the R.A.A.F. would like; whatever the cost.*

(7) **Critically important problems severely delaying and damaging the F-35 Joint Strike fighter project and the R.A.A.F.'s 72 F-35A's**

Block four (4) software required to get the F-35A to full combat capability (and NOT Block 3F as U.S.A.F. advises the public)

- (1) J.S.F. (f-35a) program has begun working on a long-range modernization plan to upgrade *the Joint Strike Fighter's combat power*.
- (2) This modernization package, with the so-called Block 4 software upgrade at its core, is essential to the aircraft reaching its "full warfighting capability," *Maj. Gen. Jeffrey Harrigan*, the Air Force's F-35 integration director, told Congress yesterday. (OCTOBER 21,2015)
- (3) The *Air Force F-35A model* will reach Initial Operating Capability (IOC) in December 2016, but it won't have all the advertised features — i.e. full capability — at that time. The modernization effort will cost \$2.6 billion in R&D through 2020 alone.
- (4) Major General Harrigan statement is a critically piece of information because it provides irrefutable evidence that the U.S.A.F. is misleading the public and the U.S. Congress by declaring I.O.C. with Block 3F software and declaring its F-35A's will be fully combat operational.
- (5) Major General Harrigan statement is a critically piece of information because it provides irrefutable evidence that the U.S. Marines decision to declare I.O.C. for its F-35B's is misleading the public and the U.S. Congress by declaring I.O.C.
- (6) Joint Strike Fighter project has been yet another project which is too many years over time, vastly more expensive than planned and has failed to deliver the expected performance in the F-35A , F-35B and F-35A as explained in great detail in DOTE annual reports.
- (7) The Pentagon bears much of the responsibility for failing to adequately supervise Lockheed Martin and its many subcontractors from 2001 which caused the J.S.F. project to slow to a tortoiselike pace in its development, testing and trials. In 2001, the first J.S.F. flew and will take more than twenty (20) years to get to a full combat operational state . Its tortoiselike pace has produced a very ugly and very expensive problem because obsolescence has now started to damage the project. EOTS requires replacement and a wide area radar added to the AESA radar.
- (8) Lockheed Martin also bears responsibility for delays, cost over runs, slow development and slow testing because it too failed to to adequately supervise its many subcontractors.
- (9) For many years; the DOTE Annual Report on the Joint Strike Fighter has been severely critical of the project and continues to be so in its latest 2015 report sent to the U.S. Congress in early February 2015. It provides irrefutable evidence to the Senate inquiry on the J.S.F. that the project has enormous number of many very hard to fix problems which will take to around 2025 (another ten years) to completely fix which will then finally get the F-35A jet fighter; which Australia is purchasing to a full combat capability.

DOTE Annual Report on the Joint Strike Fighter makes it plain to see that an enormous

*amount of software writing and lab trials of its electronics and software plus rigorous testing of the F-35A at Red Flag exercises to prove the F-35A is fully combat capable is required.*

*It will be a very difficult task to achieve; given the past history of the J.S.F. project from 2001 to 2015. Read D.O.T.E. Annual reports for 2011, 2012, 2013 2014 and 2015 and also read statements to U.S. Congress by Pentagon senior staff supervising the project such as Lt General Bogdan and U.S.A.F. Major General Harrigan.*

*The F-35A must be flown at Red Flag exercises to prove the F-35A is fully combat capable against the Su-27, Su-30 and Su-35 (fitted with AESA radar and infra red search and track (IRST) NOT done to date.*

*The F-35A must be flown at military exercises over the ocean to prove the F-35A is fully combat capable against naval ships fitted with long range SAMS similar to ESSM and SM-6. NOT done to date.*

*The F-35A must be flown at military exercises over land to prove the F-35A is fully combat capable against enemy forces equipped with long range SAMS similar to ESSM and SM-6. NOT done to date.*

J.S.F. Project will NOT provide an F-35A jet fighter with full combat capability until BLOCK FOUR (4) software has been written, tested and trialled in the F-35A and weapons proven at Red Flag exercises:

*It is plain to see from Major General Harrigan's comments to U.S. Congress and DOTE annual report in 2015 that the J.S.F. Project will NOT provide an F-35A jet fighter with full combat capability until BLOCK FOUR (4) software has been written, tested and trialled in the F-35A and weapons proven at Red Flag exercises.*

Australia' F-35A joint strike fighters will NOT be fully combat capable until around 2023 to 2025 (after Block 4 software and JSOW-C, LRASM, Konigsberg J.S.M. And N.S.M. and

AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)

*By combining all the information in the 2015 DOTE annual report and earlier annual reports plus the statements made by both Lt General Bogdan and U.S.A.F. Major General Harrigan to the U.S. Congress; a reasonable person with a strong technical knowledge of the J.S.F. Project can reasonably conclude that Australia' F-35A joint strike fighters will NOT be fully combat capable until around 2023 to 2025 after Block 4 software and JSOW-C, LRASM, Konigsberg J.S.M. And N.S.M. And many other weapons have all been successfully integrated and fully tested in combat trials.*

The AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) is a medium range, supersonic, air-launched tactical missile whose primary job is to attack and destroy enemy radars. To be fitted to EA-18G Hornet which will be operated by R.A.A.F. To be integrated on F-35A at an unknown date which could easily be 2025 because there are so many weapons to be integrated on the F-35A.

*R.A.A.F. will dispute this date of 2023 to 2025 for full combat operational state for F-35A but the onus is on it to explain what it defines as fully combat capable and in what years Block 4.1 to 4.4 is scheduled to occur and when weapons trials for all the weapons to be*

*fitted to the F-35A will occur.*

Defining what capabilities the F-35A requires to be fully combat capable:

Author defines what capabilities the F-35A requires to be fully combat capable.

- (a) being fully capable of successful air to air combat at both Beyond Visual Range and short range against the Su-27, Su-30 and Su-35 ( all fitted with AESA radar and infra red search and track (IRST);*
- (b) successfully dropping the JSOW-C glide bomb; JDAM and JDAM ER glide bombs and laser guided bombs in R.A.A.F. inventory in a combat environment;*
- (c ) successfully firing the Konigsberg air to surface missile in a combat environment which Australia is financially contributing to along with Norway ;*
- (d) successfully firing both the Harpoon and Advanced Anti-Radiation Guided Missile (AARGM) missile in a combat environment*
- (e) successfully firing the LRASM and JASSM and JASSM ER in a combat environment;*
- (f) successfully firing the AMRAAM radar guided air to air missile in a combat environment;*
- (g) successfully firing the AIM-9X infra red guided air to air missile in a combat environment;*
- (h) pilot's helmet is fully functional in a combat environment;*
- (i) ejector seat is safe and fully functional in a combat environment;*
- (j) F-35A is fully operational in Australia' monsoon and can take off from Darwin, Tindal , Learmonth and Curtin during the monsoon and operate safely in thunderstorms and in heavy monsoonal rain. This can only be determined by lengthy trials which the R.A.A.F. have NOT discussed in public because DOTE annual report makes it plain to see that a lightning strike will cause the F-35A to crash. Read D.O.T.E. annual reports for a technical analysis of this critical problem.*
- (k) successfully firing the long range Meteor ramjet air to air guided air to air missile in a combat environment; Critically important capability because rocket powered AMRAAM is much inferior to this missile and Meteor is required when against Su-27, SU-30 and Su-35.*
- (l) ALIS system is sufficiently functional to be used in a combat environment such as in a 1950's Korean war scenario;*
- (m) Block 4.1, plus 4.2. plus 4.3. plus 4.4. software is fully functional in a combat environment;*
- (n) F-135 jet engine has been fully trialled at Red Flag to determine if the "fix" being done to F-135 jet engines for the J.S.F. is sufficient to allow the J.S.F. to be fully combat capable in air to air combat against the Su-27, 330 and 35 jet fighter aircraft.*
- (o) electronics such as current EOTS has been replaced with a superior version under Block 4*
- (p) electronics are replaced as they become obsolete. A major problem because*

*tortoiselike development causes the F-35A to become obsolete in regard to its electronics such as EOTS.*

Cost of F-35A is outrageous:

Australia had already purchased two JSF at the costs of U.S. \$120 million each totalling U.S. \$240 MILLION and got next to nothing for the money as both are only useful for limited training and a long way from being fully combat capable (around 2025 and they will be 10 years old) , Fantasyland thinking to state that future F-35A will drop substantially in price given the limited production for the U.S. Navy, U.S. Marines and U.S. A.F. And international buyers wary of buying immature aircraft.

NO mention by R.A.A.F. of the cost of “concurrency” ie refitting the aircraft because of design faults coming to light and electronics becoming obsolete.

NO mention by R.A.A.F. that the 2 F-35A's already bought are obsolete and require new EOTS and new wide area radar in a Block 4 upgrade.

Current R.A.A.F. plan is to purchase an additional eight in 2018; another eight in 2019 and then purchase 15 aircraft a year up until 2023, when it would make a final purchase of 9 JSF. NO mention by R.A.A.F. of the cost of “concurrency” ie refitting these aircraft because of design faults coming to light and their electronics becoming obsolete.

NO mention by R.A.A.F. that all of the 72 F-35A's will be obsolete because they will all require Block 4 software and require new electronics such as replacing their EOTS in the 2020's and taxpayers will be paying for new EOTS and for new wide area radar in planned Block 4 upgrade. Block 3F software does NOT provide full combat capability.

NO mention by R.A.A.F. that the F-135 jet engine has a critical design failure which became evident in June 2014; when an F-35A was destroyed and written off and used for spare parts. NO long term fix. NO mention by R.A.A.F. that the F-135 jet engine has NOT yet been tested at Red Flag exercises.

Author provides minimum cost alternatives to the F-35A for Senators to assess.

Ugly hidden costs to Australian taxpayer which R.A.A.F. is silent about:

A reasonable person with a solid technical knowledge of the F-35 joint strike fighter project can easily determine that Australian taxpayers will have to fund many of the Block 4 software upgrades and many of the weapons trials to get Konigsberg JSM-NSM fully combat operational along with ASRAAM and JDAM, JDAM ER, JASSM, JASSM ER, LRASM and AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) and many other weapons.

*Development of the Block 3F version of the Lockheed Martin F-35 Joint Strike Fighter (JSF)*

Development of the Block 3F version of the Lockheed Martin F-35 Joint Strike Fighter (JSF) cannot be completed on the current schedule—by July 31, 2017:

DOTE annual report 2015 examines delays in Block 3F software:

Development of the Block 3F version of the Lockheed Martin F-35 Joint Strike Fighter (JSF) cannot be completed on the current schedule—by July 31, 2017—without shortcuts that risk failure in the initial operational test and evaluation (IOT&E) program, according to Michael Gilmore, the Pentagon's director of DOTE. Block 3F is supposed to be the culmination of the system development and demonstration (SDD) phase. But lengthy delays in earlier versions of software has also severely delayed Block 3F causing weapons capabilities to shift to Block 4.1 to 4.4 software upgrades.

**New replacement to current EOTS (Electro-Optical System) is a high priority for F-35A Block 4 software upgrade**

**Source: July 2, 2015 Aviation Week & Space Technology**

OBSOLETE EOTS needs replacing:

Electro-Optical Targeting System (EOTS) is already behind the state of the art in EO imaging and processing, and will fall further behind by 2020 as a new generation of pod-mounted systems enters service.

A comprehensive overhaul of one of the most important sensor systems on the Lockheed Martin F-35 Joint Strike Fighter is a high priority for the Block 4 upgrade program, say company officials. It is needed because the Electro-Optical Targeting System (EOTS) is already behind the state of the art in EO imaging and processing, and will fall further behind by 2020 as a new generation of pod-mounted systems enters service. Block 4 software project will allow many weapons and sensors to become fully combat operational.

The DOTE annual report for 2015 stated that the current schedule for Block 3F software to complete System Development and Demonstration (SDD) and enter IOT&E by August 2017 is unrealistic. Instead Block 3F development and flight testing would finish around January 2018. Based on these projected completion dates for Block 3F developmental testing, IOT&E would not start earlier than August 2018.

In september 2015, Lockheed martin announced a new improved version of its EOTS. The new sensor developed internally by Lockheed is similarly sized and shaped to fit neatly into the same forward undercarriage position on the F-35, and the first prototype is expected in 2016. The new and improved capabilities include short-wave infrared, high-definition television, infrared marker and superior image detector resolution than the baseline EOTS.

EOTS is obsolete:

Even though the company's current targeting systems, which combines forward-looking infrared and infrared search and track for precise air-to-air and air-to-ground targeting, was considered revolutionary in the 2000s, more than 15 years have passed since it entered development and the technology and threat has moved on.

The company says the current sensor, miniaturised for low drag and stealth, meets all the contractual specifications required by the Pentagon. The new system offers the F-35 programme a significant leap in terms of target recognition and detection capability. Advanced EOTS is consistent with the timeline set forth by the F-35 Joint Program Office, which includes follow-on development for F-35 software and hardware in Block 4.

Lockheed Martin Missiles and Fire Control says it has delivered 170 baseline EOTS sensors to date from its sensor and datalink production facility in Orlando, Florida, and the advanced system has been designed internally "with significant investment from Lockheed Martin and its suppliers". It would be a further upgrade option purchased at the discretion of the DOD and international F-35 partners and customers. "Due to its similarity in shape and size to EOTS, Advanced EOTS can be installed with minimal changes to the F-35's interface," Lockheed said in a 10 September 2015 news release. "It will be housed behind the same low-drag window, maintaining the F-35's stealthy profile. Advanced EOTS production will be completed on the current EOTS line."

Two of the Lockheed Martin F-35's key sensors should be priorities for a future operational standard in Block 4 software upgrade, says a top US Air Force general.

Big SAR-Upgrading the Lockheed electro-optical targeting system and adding a wide-area high-resolution synthetic aperture radar (SAR) mode – dubbed "– Big SAR" to the Northrop Grumman APG-81 active electronically scanned array (AESA) are must-haves, says Gen Herbert "Hawk" Carlisle, chief of Air Combat Command on 3 June 2015.

"I think as we look to the future, the Big SAR and advanced EOTS are the things we have to have on the sensor side." says Carlisle, who spoke at an Air Force Association event in Washington, DC, this week. "The Big SAR radar can't afford to move, and we've got to get to that advanced capability on the EOTS. Those are two that are kind of in the lurch right now. I'll tell you, the advanced capability on the EOTS is one we're working hard on."

In 2007, Flight International magazine reported that the Big SAR capability was originally approved to be introduced in Block 3, which enters service next year. But that capability was delayed to at least Block 4.

The Pentagon is deciding what new weapons and capabilities will be integrated with the fifth-generation aircraft beyond those planned for the Block 3F configuration, which represents the "full warfighting capability."



Those improved capabilities will be rolled out in Block 4, which will be delivered in cycles through the early 2020s.

The air force is also keeping an eye on software issues discovered during testing, namely the fusion of information from the aircraft's sensor suite. "It's one of the things we're working hard on a making some progress, but we've got a ways to go," Carlisle says.

For weapons, he places a premium on the integration of Raytheon's Small Diameter Bomb II and delivery of more advanced air-to-air combat weapon systems beyond the AIM-120C Advanced Medium-Range Air-to-Air Missile being integrated in earlier configurations.

Carlisle says improved air-to-air capabilities are vitally important since the air force did not buy enough F-22 Raptor air superiority jets. The air force currently has 180 Raptors, significantly fewer than the original plan calling for buying 750. He says it is simply a capacity issue.

"Probably one of the greatest mistakes made was the lack of more F-22s," he says of the decision to end Raptor production early.

### Sixth-generation" fighter for both the Navy and Air Force: 21 january 2015

Northrop Grumman has stood up a pair of teams dedicated to developing a "sixth-generation" fighter for both the Navy and Air Force.

LOS ANGELES —\_Northrop Grumman has stood up a pair of teams dedicated to developing a "sixth-generation" fighter for both the Navy and Air Force, years before the services intend to issue requests for information on potential replacements for current aircraft.

It's an aggressive move that Tom Vice, president of Northrop's aerospace division, hopes will pay off in a big way for his company.

"Northrop Grumman will compete for the next generation fighter," Vice flatly declared, noting that there is a program manager already leading a team of Northrop staffers on the program.

When asked whether he envisioned Northrop acting as a prime contractor on a future fighter, he added "of course."

Vice's comments were made during a trip to Northrop facilities in California, arranged and paid for by the company.

Both the Air Force and Navy have begun preliminary planning for what is referred to as next-generation air dominance, or "sixth-generation" fighters. After working together on the F-35

joint strike fighter, the two services are looking at procuring their own respective jets.

The Navy's program is dubbed F/A-XX, while the Air Force's effort is known as F-X. In September, Col. Tom Coglitore, Air Superiority Core Function Team chief at Air Combat Command, told Defense News he wants to see Milestone A acquisition activity in early fiscal 2018.

A spokesman for Northrop confirmed that there are individual teams focused on each of the service requirements.

Vice indicated that Northrop is looking at a supersonic, tailless airplane design as a potential solution, something he noted no one has ever done before.

"You don't see any supersonic airplanes today without tails," Vice said. "Why? It's really hard. But if you think about new ways to do advanced computing, very high speed processing, new materials – that's why the research we do is so important, so we can build what could likely be the next-generation fighter in 20 years. It's going to require that kind of technology, because to build that airplane is going to be really, really hard."

He also hinted that making a system optionally manned would be relatively easy for the company.

While Vice may be confident in his program, outside analysts have questioned whether Northrop can survive long-term as an attack airframe manufacturer, especially if it loses out on the Air Force's Long Range Strike-Bomber program.

That program is expected to award a contract to either Northrop or its competitor, a team of Lockheed Martin and Boeing, in late spring or early summer.

*COMMENTARY-F-35A could easily become obsolete by 2025 when 6<sup>th</sup> generation aircraft begin to be operated in trials USAF requires many hundreds of 6<sup>th</sup> generation jet fighters to add to its paltry 150 fully combat operational F-22 Raptors. Most urgent priority now the Chinese are building modern jet fighters superior to the F-35A. R.A.A.F. silent on this point and a likely waste of A\$17 BILLION.*

**UPDATED 1/21/15: This story was updated to clarify that there are two Northrop teams working individually on the Navy and Air Force programs.**

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When will the F-35A be fully combat capable to operate over Syria?

*U.S.A.F. and J.P.O. obfuscation CANNOT hide the plain to see fact that the F-35A CANNOT be sent to war in Syria because it has so many critical faults and shortfalls as explained in DOTE annual report for 2015..*

Commentary by author- F-35A CANNOT be sent to war in Syria for many years to come because there are so many hard to fix problems requiring a fix as DOTE annual 2015 report proves. A F-35a would require a fully operational ALIS and Block 4.2 software with all its weapons fully trialled and able to be fired from F-35A. New design EOTS and Big SAR need to be fitted too. A new design jet engine is required because the F-135 has a fatal flaw in its design as shown in the catastrophic June 2014 jet engine fire. NO long term solution. Just a short term high risk fix and jet engine has NOT been proven at Red Flag exercises to date. Block 4.1 to 4.4 software will need to be fully proven to allow important SMDB Block 2 version to be dropped. New jamming electronics would be required if there was an enemy SAM threat.

**F-35A would fail in air to air combat (defending Darwin) against the su-30 and su-35 because the sum of its many air to air combat deficiencies makes it an easy target for skilled su-30 and su-35 pilots:**

*F-35A would fail in air to air combat such as defending Darwin) against the Su-30 and su-35 because the sum of its many air to air combat deficiencies makes it an easy target for skilled Su-30 and su-35 pilots. R.A.A.F. is silent on the limitations in the F-35A design and its limited capabilities against 21<sup>st</sup> century Su-30 and Su-35 jet fighters fitted with AESA radar andIRST infra red search and track to track the hot exhaust plume emanating from the rear of the F-35A*

**Author's own objective and independent list of critical problems with the F-35A in a combat scenario:**

**(a) NO supercruise capability for F-35A; a fatal flaw in air to air combat against Su-30/35.**

**NO supercruise capability for F-35A is a fatal flaw if the F-35A is involved in air to air combat against the dangerous Su-30/35.**

**(b) too few, just four ( 4) AMRAAM air to air missiles are carried internally:**

**Too few, just four ( 4) AMRAAM air to air missiles carried internally by F-35A which are easily jammed by digital jamming equipment (DRFM) carried by enemy jet fighter aircraft. DRFM wrecks F-35A air to air combat capability. F-35A pilot is then forced to rely on too short range AIM-9X; another fatal flaw and the F-35A is involved in a close in dog fight, air to air combat against the dangerous Su-30/35 and is likely to be shot down.**

**(c) tortoiselike transonic acceleration from Mach 0.7 to Mach 1.2 is a fatal flaw in air to air combat:**

Tortoiselike transonic acceleration from Mach 0.7 to Mach 1.2 is a fatal flaw in air to air combat if the F-35A is involved in air to air combat against the Su-30/35.

**(d) no rearward facing radar , no left side lobe and no right side lobe AESA radars is a fatal flaw in air to air combat against Su-30/35:**

**NO** rearward facing radar , **NO** left side lobe radar and **NO** right side lobe radar are fatal flaws if the F-35A is involved in air to air combat against the Su-30/35.

**(e) radius of action is too limited in air to air combat against the Su-30/35:**

Radius of action is too limited in air to air combat against the Su-30/35 because the F-35A internal useable volume of fuel is too small causing the F-35A to spend too little time in enemy air space before being forced to go back to base because fuel is running out.

**(f) No long range infra red guided air to air missile in U.S.A.F. inventory; a fatal flaw in air to air combat against Su-30/35:**

**NO long range infra red guided air to air missile in U.S.A.F. inventory; a fatal flaw in air to air combat against Su-30/35.** European made ASRAAM would be superior to AIM-9X which is now obsolete. Reliance on the too short range, infra red guided AIM-9X air to air missile is a fatal flaw in air to air combat against Su-30/35.

**(i) AMRAAM air to air missile is obsolete because it is rocket powered only and is old design:**

AMRAAM air to air missile is obsolete because it is rocket powered only; a fatal flaw in air to air combat if the F-35A is involved in air to air combat against the Su-30/35. Compare AMRAAM to the far superior Meteor with its 100 mile Mach 4 plus speed and ramjet engine.

**NOT** fitted to F-35A. Bad decision making.

**(j) AIM-9X is obsolete because it is rocket powered only and is too short in range.**

AIM-9X is obsolete because it is rocket powered only and is too short in range. MBDA European made ASRAAM would be superior. **NOT** fitted to F-35A at present Requires Block 4 software to be written and trials done.

**(k) F-135 jet engine is inferior to RR-GE designed F-136 jet engine and is a serious flaw because the F-35A should be flying with the higher tech, superior F-136 jet engine made by RR-GE:**

F-35A should be flying with the more high tech, superior F-136 jet engine made by RR-GE which was wrongly cancelled by U.S.A.F.

This inane decision has undermined (a) performance of the F-35A in air to air combat and

Catastrophic fire in the F135 jet engine in June 2014 has NOT got a long term fix Read jane's. Great concern as jet engine could easily fail under high "G" forces. NOPT trialled at Red Flag exercises and remains unproven to date.

**(l) Block 4 software to be written and to be proven at Red Flag before 250 pound small diameter bomb 2 to be carried internally:**

Block 4 software to be written and to be proven at Red Flag before 250 pound small diameter bomb able to be carried internally.

**(m) NO capability of safely operating from 55,000 to 60,000 feet and above 60,000 feet for F-35A's human pilot because there is NO full pressure suit for F-35A pilot to wear which is similar to U-2):**

**F-35A has NO capability of safely operating from 55,000 feet to 60,000 feet and above 60,000 feet for F-35A's human pilot because there is NO full pressure suit for pilot which is similar to U-2 available.**

Operating above 55,000 feet will likely cause hypoxia and likely loss of aircraft. Inane decision making by U.S.A.F. to have NO full pressure U-2 type suit for F-35A pilot to wear because it would give the F-35A pilot a clear advantage against the Su-30/35..

**Sum of the F-35A's many combat deficiencies makes the F-35A an easy target for skilled Su-30 and Su-35 pilots:**

**The F-35A would fail in air to air combat against the Su-30/35 because the sum of its many combat deficiencies makes it an easy target for skilled Su-30/35 pilots. Air war would be lost by the R.A.A.F. by heavily relying on F-35A against Su-30/35.**