





## 131<sup>st</sup> Fighter Wing

### **A description of the mission, capabilities, and accomplishments of the personnel and aircraft located at Lambert IAP AGS.**

- Summary of the extensive involvement of the 131<sup>st</sup> Fighter Wing in recent combat operations and a review of the unit's outstanding inspection record.
- Summary of the 131<sup>st</sup> Fighter Wing's F-15Cs capabilities as the aircraft best suited for Homeland Defense.
- Talking paper on the combat effectiveness and cost efficiency of the 131 FW under the Air Force BRAC concept of 18 Primary Aircraft Authorized (PAA) versus the 24 PAA of an Active Duty squadron.

## 131<sup>st</sup> Fighter Wing Deployments and Inspections

### PURPOSE:

The following information describes the 131<sup>st</sup> Fighter Wing's support of combat operations and its inspection record.

### DISCUSSION:

#### 1. Deployments

- a. 1996 - Operation PROVIDE COMFORT, Incirlik AB, Turkey
- b. 1997 - Operation NORTHERN WATCH, Incirlik AB, Turkey
- c. 1998 - Operation NORTHERN WATCH, Incirlik AB, Turkey
- d. 2000 - Operation SOUTHERN WATCH, Prince Sultan AB, Saudi Arabia
- e. 2002 - AEF rotation to Keflavik AB, Iceland
- f. Operations NOBLE EAGLE, ENDURING FREEDOM and IRAQI FREEDOM
  - i. Security Forces
  - ii. Civil Engineers/Firefighters
  - iii. Services
  - iv. Logistics Support
  - v. Operational Support
  - vi. Locations include: Central Asia, Turkey, Saudi Arabia, Oman, Germany, Qatar, United Arab Emirates, Afghanistan, Kuwait, Southwest Asia

#### 2. Inspections

- a. March 2001 – 8<sup>th</sup> Air Force Standardization and Evaluation Inspection
  - “Outstanding”
- b. October 2002 – ACC Unit Compliance Inspection
  - 97% In Compliance
- c. August 2003 - Health Services Inspection
  - “Excellent”
- d. April 2004 – ACC Operational Readiness Inspection
  - “Excellent”
- e. July 2004 – ANG Environmental, Safety, Occupational Health, Compliance Assessment and Management Program (ESOHCAMP) Inspection
  - “Best Seen to Date”
- f. March 2005 – 12<sup>th</sup> Air Force Standardization and Evaluation Inspection
  - “Outstanding”

## Why The F-15 Is Best Suited For The ONE Role

**PURPOSE:**

The following information describes how the F-15C weapons system demonstrates a distinct advantage over the block 30 F-16 in 6 of 8 key Homeland Defense mission requirements.

**DISCUSSION:**

1. The F-15C Eagle and F-16 Fighting Falcon are two weapons systems that share a solid history of wartime success. The F-15C, with a 104 to 0 kill ratio, is the most lethal combat proven air-to-air weapons system ever created. As we transition to the Homeland Defense mission, we need to assess the advantages and disadvantages of the F-16 Block 30 and F-15C weapons systems to determine which airframe is better suited for the role.
  
2. Eight areas of emphasis will demonstrate which weapons system is better suited to deter a threat aircraft in an asymmetric environment. These eight areas include:
  - a. On station time
  - b. Communications
  - c. Maintenance Safety Record
  - d. Navigational Aides
  - e. Data Link
  - f. Situational Enhancements
  - g. Radar Detection Capabilities and Upgrades versus large and small aircraft
  - h. Interrogator Capabilities and Upgrades

	F-16 Block 30	F-15C	Advantage
On Station Time	2 Hours	2 Hours	----
Communications			F-16
Mx Safety Record			F-15C
Navigational Aides			F-15C
Data Link			F-15C
Situational Enhancements			F-15C
Radar Detection			F-15C
Small Aircraft			F-15C
Large Aircraft			F-15C
Radar Upgrades			F-15C
Small Aircraft			F-15C
Large Aircraft			F-15C
Interrogator			F-15C
			F-15C
Interrogator Upgrades			F-15C
			F-15C

Yellow = No advantage



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### 3. On station time.

- a. A block 30 F-16 with 2 external fuel tanks is capable of carrying 11,700 lbs of fuel. Calculate engine burn rates (3000lbs/hour) at a standard CAP altitude of 20-25K MSL, with a standard Homeland Defense weapons loadout. Subtract enroute fuels (2500 lbs) and RTB fuels (3500lbs) the average time on station without air refueling is 1 hour and 54 minutes.
- b. An F-15C with 2 external fuel tanks is capable of carrying 22,200 lbs of fuel. Calculate engine burn rates (3000lbs/hour/per engine) at a standard CAP altitude of 20-25K MSL, with a standard Homeland Defense weapons loadout. Subtract enroute fuels (4000 lbs) and RTB fuels (6500 lbs) the average time on station without air refueling is 1 hour and 55 minutes.
- c. During Homeland Defense missions, the block 30 F-16 and F-15C weapons systems demonstrate the same capability for on station time.

### 4. Communications.

- a. A block 30 F-16 has 1 UHF and 1 VHF radio. VHF is the most common form of communication between FAA assets, commercial, and privately owned aircraft. Block 30 F-16's are able to verbally communicate with private or commercial aircraft that are violating or close to violating No-Fly Zones.
- b. An F-15C has 2 UHF radios. FAA assets are able to communicate with F-15C aircraft via UHF radios. F-15C aircraft are unable to verbally communicate with commercial or privately owned aircraft. F-15C's stationed at Elmendorf AFB, AK have been successfully modified with VHF radios. VHF radio funding for all F-15C's operating under the Homeland Defense mission has been approved and will soon be fielded.
- c. During Homeland Defense missions, the block 30 F-16 weapons system with VHF capability demonstrates a slight advantage over the F-15C until the F-15C is modified with VHF radios. In some cases, such as the 11 May 2005 White House violation, if the target of interest (TOI) is not on the correct VHF frequency, verbal communication is not possible. Once modified, the F-15C will demonstrate an advantage by still retaining dual UHF capability in addition to VHF capability.

### 5. Maintenance Safety Record.

- a. From 10 June 1995 to 09 June 2005 the total number of F-16 aircraft lost due to engine failure is 40.
- b. From 10 June 1995 to 09 June 2005 the total number of F-15 aircraft lost due to engine failure is 3.
- c. During a ten year span over 13 times as many F-16 aircraft have been lost due to engine failure than F-15 aircraft. During Homeland Defense missions, the maintenance reliability of the F-15 weapons system demonstrates an advantage over the F-16 weapons system.

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### 6. Navigational Aides.

- a. A block 30 F-16 is able to effectively navigate through the use of INS/GPS waypoints and TACAN. INS/GPS waypoints and TACAN are used during Homeland Defense missions to establish No-Fly Zones.
- b. An F-15C is able to effectively navigate through the use of INS waypoints and TACAN as well. In addition, the F-15C is equipped with a programmable Situational (SIT) display allowing pilots to always maintain awareness to FAA restrictions, No Fly Zones, and airborne aircraft. This capability allows an F-15C pilot to easily discern his location within the area of concern and make effective intercept decisions.
- c. During Homeland Defense missions, the F-15C weapons system demonstrates a slight advantage over the F-16 weapons system due to the addition of a Situational Display.

### 7. Data Link.

- a. A block F-16 is equipped with an internal data-link that allows pilots to share on-board information. This Situation Awareness Data-Link (SADL) is a F-16 specific data-link system that is not fully integrated with the LINK-16 architecture. Studies and funding do exist to incorporate SADL into the full Net-Centric concept of operations. Until that time, the block 30 F-16 will continue to operate autonomously within its own data-link architecture.
- b. The F-15C is equipped with Fighter Data Link (FDL) class 2 terminals that are fully integrated within the current LINK-16 data-link architecture. F-15C's share own-board data not only with other F-15C's, but with high value assets such as AWACS, and command and control centers.
- c. During Homeland Defense missions, the F-15C weapons system demonstrates a large advantage over the block 30 F-16 weapons system due to its' current interoperability within the established Homeland Defense LINK-16 architecture. The F-15C's ability to data-link targets of interest (TOIs) to the command and control center provides effective and real time non-verbal information that is critical to the Homeland Defense command authority. The command authorities ability to "see" the scenario developing real-time versus relying solely on verbal communication from the pilots provides the best overall picture.

### 8. Situational Enhancements.

- a. The block 30 F-16 is not funded or scheduled to receive any further upgrades that would increase the pilots' situational awareness during a Homeland Defense mission.
- b. The F-15C is fully funded and is currently being upgraded with the Joint Helmet Mounted Cueing System (JHMCS). JHMCS provides the pilot with a situational display and cueing system over the right eye that greatly enhances applicable information. During intercepts versus low-slow aircraft, JHMCS allows the pilot to operate "eye's out" in a low altitude, slow environment while still effectively intercepting the aircraft. The 110<sup>th</sup> Fighter Squadron at St Louis will be the first Air National Guard squadron to receive JHMCS in October of 2005.
- c. During Homeland Defense missions, the F-15C weapons system demonstrates a large advantage over the block 30 F-16 weapons system due to the Joint Helmet Mounted Cueing System (JHMCS). The F-15C's ability to intercept low-slow

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moving targets while maintaining a true “eye’s out” capability is vital to intercept success.

9. Radar Detection Capabilities and Upgrades versus large and small aircraft.
  - a. The block 30 F-16 is equipped with an APG-68 Mechanically Scanned Array (MSA) radar. The APG-68 is capable of searching and tracking both small and large aircraft at classified ranges. The block 30 F-16 is not funded or scheduled to receive significant upgrades to its current radar system.
  - b. The F-15C is equipped with an APG-63 Mechanically Scanned Array (MSA) radar. The APG-63 is capable of searching and tracking both small and large aircraft at twice the range of the APG-68. Congressional measures are being put forth to fund the F-15C with a new radar called the APG-63(v)3. This radar is an Active Electronically Scanned Array (AESA) that is similar to the APG-62(v)2 fielded at Elmendorf AFB, AK. An APG-63(v)3 is capable of searching and tracking both small and large aircraft at three times the range of the APG-68.
  - c. During Homeland Defense missions, the F-15C weapons system demonstrates a large advantage over the block 30 F-16 weapons system due to the F-15C current radar search and track capabilities. Prior to fighter aircraft detecting a target of interest (TOI), the pilot must rely on FAA and area defense to point the pilot in the correct direction. Until the pilot is able to locate the TOI with its’ radar, the probability of deterring or intercepting the TOI is very low. With the addition of the APG-63(v)3, F-15C aircraft will be able to detect and track TOI’s at three times that of the block 30 F-16. The further out a pilot can detect and track a TOI equates to valuable time the command authority has to make crucial decisions during Homeland Defense missions.
10. Interrogator Capabilities and Upgrades.
  - a. The block 30 F-16 is not equipped with an Air-to-Air Interrogator (AAI). The block 30 F-16 is not funded or scheduled to receive AAI upgrades.
  - b. The F-15C is equipped with an Air-to-Air Interrogator (AAI). All commercial and private aircraft are required by FAA regulation to “squawk” a specific transponder code while operating in specific airspace. This code is transmitted in a manner that F-15C’s are able to detect and correlate with radar contacts. The F-15C is able to interrogate Modes 1, 2, 3, 3c, and 4. The APX-114 interrogator is part of the APG-63(v)3 radar. This interrogator allows the pilot to interrogate Modes 1, 2, 3, 3c, 4, 5, and S. In addition, once the pilot achieves radar contact on a TOI, the APX-114 will display to the pilot the specific code sequence the TOI is squawking.
  - c. During Homeland Defense missions, the F-15C weapons system demonstrates a large advantage over the block 30 F-16 weapons system due to the Air-to-Air Interrogator (AAI). The block 30 F-16 has no current or future capability to positively identify a TOI. The F-15C has the current ability to positively identify a TOI. With future upgrades to the APX-114 the F-15C will be able to increase its’ interrogator abilities to cover Modes 5, and S.
11. Source Data for F-15 vs F-16
  - a. Block 30 F-16 APG-68 Radar Data: Air Force Classified Manuals
  - b. Block 30 F-16 Situation Awareness Data Link (SADL): Air Force Classified Manuals

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- c. F-15C JHMCS Data: Air Force Classified Manuals and Boeing Proprietary Data
- d. F-15C APG-63 Radar Data: Air Force Classified Manuals
- e. F-15C APG-63(v)3 Radar Data: Raytheon Proprietary Data
- f. F-15C APX-114 Interrogator: Boeing Proprietary Data
- g. FAA Regulations and Rules of Flight

## Primary Aircraft Authorized (PAA)

### PURPOSE:

The following information discusses the 2005 Air Force BRAC's varied approach to the optimum Primary Aircraft Authorized (PAA) for a fighter unit.

### DISCUSSION:

1. The following is an excerpt from 2005 BRAC Report, Volume V, Part 1, Chapter 1, Page 1.

“The Air Force recommendations in this report maximize warfighting capability by fundamentally reshaping the Service, effectively consolidating older weapons systems into fewer, larger squadrons. Small squadrons are inefficient; these more optimally sized units are more efficient and more effective operationally. The optimal size for an active duty fighter squadron is 24 aircraft. For stand-alone reserve component units, 18 aircraft is an acceptable fit because reserve component organizations generally have higher experience levels and recruit locally to keep units manned.”

2. According to the BRAC report, due to efficiency and effective operational capability, fewer, larger fighter squadrons are preferred by the Air Force.
  - a. There isn't a report or study mentioned that lends any credibility to this argument.
  - b. The 131<sup>st</sup> Fighter Wing performs the same mission as Air Combat Command (ACC) units at a significant cost savings and, therefore, is more efficient.
    - i. According to ANG, Logistics Division, the cost per flying hour (CPFH) difference between ACC and the 131 FW is over \$3000 (the 131 FW's cost per flying hour is approximately 30% more efficient than an ACC squadron).
    - ii. AFI 11-2F-15v1 mandates the minimum sorties required to maintain Combat Mission Readiness (CMR) status.
      1. AD minimum requirements
        - a. 110 sorties per year for an inexperienced pilot
        - b. 98 sorties per year for an experienced pilot
      2. ANG (131 FW) minimum requirements
        - a. 90 sorties for an inexperienced pilot - 19% less than the AD
        - b. 76 sorties for an experienced pilot - 23% less than the AD
  - c. The ANG can perform the mission more effectively than the AD.
    - i. The ANG is recognized by the Air Force (and the BRAC report) as being able to do the same mission as the AD with fewer aircraft. Reference the statement above that says, "...18 aircraft is an acceptable fit because reserve component organizations generally have higher experience levels...".
    - ii. This is further validated in the BRAC report, because the Hawaii ANG (Hickam AFB) has been determined to be an "acceptable fit" since it remains a 15 PAA squadron. The BRAC report gave no further explanation.

## Primary Aircraft Authorized (PAA)

3. Conclusions based upon the 1.25 pilot-to-aircraft ratio that both the ANG and AD utilize (calculations use CMR experienced pilots only)
  - a. The numbers below are used as a reference. Actual flying hour budgets take into consideration many more factors, but the percentage should be similar. The numbers are based upon the following calculation:
    - $PAA \times (\text{crew ratio}) \times (\text{pilot sorties required}) \times (\text{hours per sortie}) \times \text{CPFH}$
    - $ACC = 24 \times 1.25 \times 98 \times 1.0 \times 10,327$
    - $131 \text{ FW} = 18 \times 1.25 \times 76 \times 1.0 \times 7,300$
  - b. AD minimum cost per year to perform the mission = \$30,361,380.
  - c. 131 FW minimum cost per year to perform the mission = \$12,483,000.
  - d. **Bottom line: the 131 FW does the mission more effectively at 41% of the cost.**