AIR DOMINANCE: THE ESSENTIAL REQUIREMENT

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Smithsonian Institution
16 Sep 2008

USAF Photo by SrA Garrett Hothan
A Century of Air Warfare...

- World War I
- Spanish Civil War
- World War II
- The Korean War
- The Suez Incursion
- Southeast Asia
- Desert Storm
- Northern/Southern Watch
- Allied Force
- Global War On Terror
A Century of Air Warfare…

- World War I
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- The Korean War
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- Desert Storm
- Northern/Southern Watch
- Allied Force
- Global War On Terror

…and Control of the Air has been crucial…
Control of the Air (I)

• Enables fullest range of operations
  – Simultaneous offensive “Sword” and defensive “Shield”

• Secures:
  – Commander’s Initiative
    • Fulfills “what-where-when”
  – Operational Freedom
    • Execute “as you wish” not “as you have to” operations
  – Dominant Maneuver
    • Shields friendly mobility; denies enemy mobility
Control of the Air (II)

• The Single Most Important Function of an Air Force
  – Defines the very essence of the term “Air Force”

• The Enabler of Other Forms of Power Projection
  – 3D Attack dominates the 2D force

• Essential for Successful Joint Effects-Based Warfare
  – Joint Forces without it are at grave risk

• Is Not a Guaranteed American Right
  – Like democracy, it can be lost within a generation
The Air War Spectrum…

AIR SUBORDINATION

Paralysis
Fr. AF
Battle of France
(1940)

Inferiority
Ger. Air Ser.
Western Front
(1918)

AIR PARITY

Situational
GAF-VVS
Russian Front
(1943)

AIR DOMINATION

Superiority
USAF
Korean War
(1952)

Supremacy
USAF
Desert Storm
(1991)

“BAD” to “WORST”

“GOOD” to “BEST”
Comparative Design Practice, 1912

FRANCE

Deperdussin
“Monocoque Racer”

Top Speed: 108 mph

Musée de l’Air et l’Éspace Photo

AMERICA

Wright Model D
“Speed Scout”

Top Speed: 67 mph

National Museum of the USAF Photo
“Aviation has zero value for the Army”
“Only superiority in aviation permits the superiority in artillery that is indispensable for having superiority in the actual battle.”

“Victory in the air is the preliminary to victory on land.”

Général Ferdinand Foch

Photo Courtesy Wikipedia
Beginnings...

Capt. Eddie Rickenbacker and his SPAD XIII fighter

“In aviation we were entirely dependent upon our Allies.”

--Gen. John Pershing, AEF Commander, 1919
The Decline of French Power (I)

“French Aviation is Quite ill.”
--Henri Paté, 1928
“The Battle of France . . .proved that an Army can do nothing without the support of an adequate air force.”

--Pierre Cot, former French Air Minister
…and the Price Was…

“Table for 100,000, Monsieur?”

(Hitler Victory Tour, 1940)

National Archives and Records Administration Photo
Why?

- Inadequate Political and Financial Support
- Multiple Service Secretaries and Service Chiefs
- Constantly Changing Military and Political Priorities
- Shifting Doctrinal Foundations
- Inadequate Industrial Base
- Social Welfare Mindset
- “Avoid War at All Cost” Mindset
- “Self before Service,” not “Service before Self” Mindset
- Army Dominant over Air Force Through 1920’s-1930’s
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...thus was French air dominance, and France itself, lost within two decades...
Overlord: the Chief of Staff View

North American P-51 Mustang Air-Superiority Fighter

“We are about to invade the Continent and have staked our success on our air superiority…”

--Gen. George Marshall, Army Chief of Staff, 1944

National Museum of the USAF Photo
Control of the Air was the Essential

“Without air supremacy, I wouldn’t be here.”

--Gen. Dwight Eisenhower, at Normandy, 1944
Overlord: Air Dominance as Enabler...

...With Allied Fighters Dominating the Sky...

Close Air Support

Interdiction

...Allied Fighter-bombers Were Free to Paralyze Mobility...

USAF HRA Photos
“No road movement by day was possible in view of this air umbrella.” (LTG Zimmerman, early June 1944)

“Our movements are extremely slow” (VAdm. Ruge, June 9)

“Air superiority has a very grave effect on our movements. There’s simply no answer to it.” (GFM Rommel, June 10)

“The Anglo-American air force is the modern type of warfare, turning the flank not from the side but from above.” (VAdm. Ruge, mid-June)

“Where is the Luftwaffe?” (German Army Colonel, July 6)
Overlord: The German Reaction…

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So, Where was the *Luftwaffe*?

![Messerschmitt Me 262 jet fighter (1944)](image)

German Aeronautical Science and Technology Produced Potentially Significant Advances...
...Grounded...

but

Allied Air Dominance

destroyed the

Luftwaffe’s

manufacturing, sustaining and basing infrastructure, denying it technological advantage

Destroyed Me 262s, 1945

AHB MoD UK Photo
...Postwar Air Supremacy...

Global Reach

Global Power

Naval Superiority

Mach 3+ Cruise

Hypersonics

Stealth
### USAF Fighter Development, 1948-1972

<table>
<thead>
<tr>
<th>Unrealistic Concepts</th>
<th>Aircraft Needing Extensive Work</th>
<th>“Out of the Gate” Successes</th>
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</thead>
<tbody>
<tr>
<td>XF-85, YF-93</td>
<td>F-84, F-101</td>
<td>F-86</td>
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<td>F-86D, F-102</td>
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<td>XF-88, F-104</td>
<td>F-89, F-105</td>
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<td>XF-90, F-108</td>
<td>F-94, F-106</td>
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<td>XF-91, F-109</td>
<td>F-100, F-111</td>
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<tr>
<td>XP-92, YF-12</td>
<td>(48%)</td>
<td>(40%)</td>
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<td>(12%)</td>
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Southeast Asia…

F-8 Crusader vs. MiG-17 Fresco

F-4 Phantom II vs. MiG-19 Farmer

MiG-21 Fishbed

USN (top) AFFTC (bottom) Photos

National Museum of the USAF Photos
...Taught Hard but Beneficial Lessons…

SEA Reaffirmed:

Training and Combat are strongly synergistic

No substitute for experience

Fighters must be *Fighters*

Test must be *realistic*

Colonel Robin Olds, USAF
…Reshaping the Fighter Force…

McDonnell-Douglas (Boeing) F-15C Eagle
Air-Superiority Fighter

CENTCOM Photo
“Air Superiority” is never Enough...

- Battle of Britain
- MiG Alley
- Vietnam “Up North”
- 1973 Arab-Israeli War
- Falklands War

In all cases, the victor experienced surprising constraints and losses that prevented achieving decisive victory at minimal cost.
…Desert Storm…
Desert Storm’s Legacy…

- 11 nations contributed 2,614 aircraft
- Coalition formation eased by UN Action
- Built upon longstanding partnerships
- Relationships between airmen critical
- Operations faced intense scrutiny/skepticism
- Established pattern for future air organization
- Powerful “Benchmarking” legacy remains
Onset of Crisis

- 2 Aug 1990, Invasion of Kuwait
- 6 Aug 1990, King Fahd agrees to basing
- 8 Aug 1990, 1FW arrives in Gulf
- 9 Aug 1990, RAF “600 kt Gunboats” arrive
Effects-Based Air Dominant Warfare

- Iraqi AF destroyed by creative attack
  - 35 a/c lost air-to-air
  - 200 a/c lost to PGM attacks on HAS
  - 120 a/c “flushed” to Iran

- 44,145 American sorties
  - 67% by USAF
  - 19% by USMC
  - 14% by USN

- U.S. dropped 84,200 tons of bombs
  - 72% by USAF
  - 28% by USMC and USN

- PGMs were 9% of weapons (7,400 tons)
  - 90% dropped by USAF (6,660 tons)
  - 10% dropped by USMC/USN (740 tons)
“Gulf Lesson One is the value of air power”:
   --President George H. W. Bush

“This war in the Persian Gulf provided a textbook example of what air supremacy means”:
   --Lt. Gen. Anatoliy Malyukov

Desert Storm taught us something about air dominance. *We had it, we liked it, and we’re going to keep it.*
   --SecDef William Perry
…Increasing Time to IOC…

SELECTED US AIR FORCE JET FIGHTERS

Approximately a Ten-fold Increase Over Six Decades

Source: M. Knaack, *Post-World War II Fighters* (1986); data from SAF/PA
Acquisition: The “Logical” View

- Strategy
- Doctrine
- Plans
- Requirements
- Budget
- Technology
- Capabilities
- Threats

Structured, Rational, Teleological
Acquisition: The "Complex" View

- Strategy
- Doctrine
- Plans
- Requirements
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- Threats
...The Acquisition “Soup Bowl”...
...The Playing Field...

THE AMERICAN DECISION-MAKING ENVIRONMENT

- 6 PRESIDENTIAL TERMS (≧ 3 Administrations)
- 4 SENATORIAL TERMS
- 12 REPRESENTATIVE TERMS
- 8 SERVICE CHIEFS
- CONTINUOUS PERSONNEL CHANGES
- CONTINUOUS TECHNICAL/EXTERNAL CHANGES
A Bicentennial Perspective, 1976

Global Air Transport
Regional Air Transport
Business Aviation
General Aviation
Military Systems
Commercial Space
Res./Education/Workforce
Hypersonics

The Future Looked Pretty Bright!
...and the 2008 Perspective…

- Global Air Transport
- Regional Air Transport
- Business Aviation
- General Aviation
- Military Systems
- Commercial Space
- Res./Education/Workforce
- Hypersonics

An Uncertain, Problematical Future!
…Tough Times Ahead…

Source: HAF Strategic Planning Office Data; Congressional Budget Office Estimates
Evolving Defenses

- Fighters
- SAMS
- C4ISR
- AAA
- RADARS
...Pose Threats to Air Dominance...

“Double Digit” SAMs deny non-stealth forces access to the battlespace

“4th Generation Fighters” (now serving in 59 nations) outperform America’s legacy fighter force of F-15s, F-16s, and F-18s

Sukhoi Su-30 V-T Flanker (more maneuverable than any fighter except F-22)
...For Example...

...Today, if NATO wanted to establish an air exclusion zone over Georgia, it could not do so with any aircraft other than the 5th Generation F-22 Raptor...

USAF Photo by A1C Jamal D. Sutter
...The Legacy Fighter in Perspective...

<table>
<thead>
<tr>
<th></th>
<th>F-15</th>
<th>Su-30</th>
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<tbody>
<tr>
<td>Radar</td>
<td>=</td>
<td>=</td>
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<tr>
<td>Weapons</td>
<td>=</td>
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<tr>
<td>Electronic Attack</td>
<td>= =</td>
<td>+</td>
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<tr>
<td>Range</td>
<td>=</td>
<td>+</td>
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<tr>
<td>Maneuvering</td>
<td>=</td>
<td>+</td>
</tr>
<tr>
<td>Airframe Age</td>
<td>=</td>
<td>+</td>
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</table>

Average F-15 age: 25.2 years
Average Su-30 age: 6.5 years
...Legacy Systems are Compromised...

Reported Detection Capabilities

Su-35BM (Irbis-E)
Su-30MKI/MKM (N011M)

...Just One Kind of Threat...

Source: Dr. Carlo Kopp, Air Power Australia, June 07
F-22 and F-35 have already demonstrated the value of Fifth Generation Fighter Technology...
...The Sincerest Form of Flattery...

...as evidenced by the Russian PAK-FA and Chinese XXJ
F-22 and F-35 have already demonstrated the value of Fifth Generation Technology… as evidenced by the Russian PAK-FA and Chinese XXJ.

F-22 Performance but at F-35 Quantities.
F-22/F-35 vs. D-D SAMS and TST*

70,000 square miles
F-22 with JDAM
Stealth + Hi Alt + Mach 1.5+
Advanced Sensors
150 nm

31,000 square miles
F-35 with JDAM
Stealth + Mach 1.0+
Adv Sen
100 nm

Potential target coverage within 10 minutes of initial detection

Advanced SAM Coverage: HQ-9, SA-20

*SAM—Surface to Air Missile
TBM—Theater Ballistic Cruise Missile
CM—Cruise Missile

Super cruise and Stealth Expand Potential Kill Zones and Ensure Attack

F-15, F-16, F-18 are not survivable
With Air Dominance Threats Growing…

- USAF needs new aircraft to ensure it can meet its Joint Force power-projection responsibilities.
- Threat evolution requires they have 5th Generation capabilities.
- Ensuring future Air Dominance requires acquiring the F-22 in meaningful numbers to counter future anti-access strategies.
A Century After Eddie Rickenbacker, Securing Air Dominance Remains The Most Critical Task for the UNITED STATES AIR FORCE
...Questions? Comments?...

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