



# AIR DOMINANCE: THE *ESSENTIAL* REQUIREMENT

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# A Century of Air Warfare...

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- 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...

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- Desert Storm
- Watch
- Allied Force
- Global War On Terror

*...and Control of the Air  
has been crucial...*

# Control of the Air (I)

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- 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)

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- 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**

**AIR  
PARITY**

**AIR  
DOMINATION**

*Paralysis*

*Inferiority*

*Situational*

*Superiority*

*Supremacy*

Fr. AF

Ger. Air Ser.

GAF-VVS

USAF

USAF

Battle of  
France  
(1940)

Western  
Front  
(1918)

Russian  
Front  
(1943)

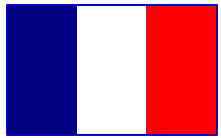
Korean  
War  
(1952)

Desert  
Storm  
(1991)

“BAD” to “WORST”

“GOOD” to “BEST”

# Comparative Design Practice, 1912



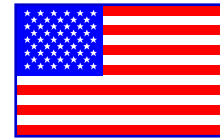
FRANCE

Deperdussin  
*“Monocoque Racer”*



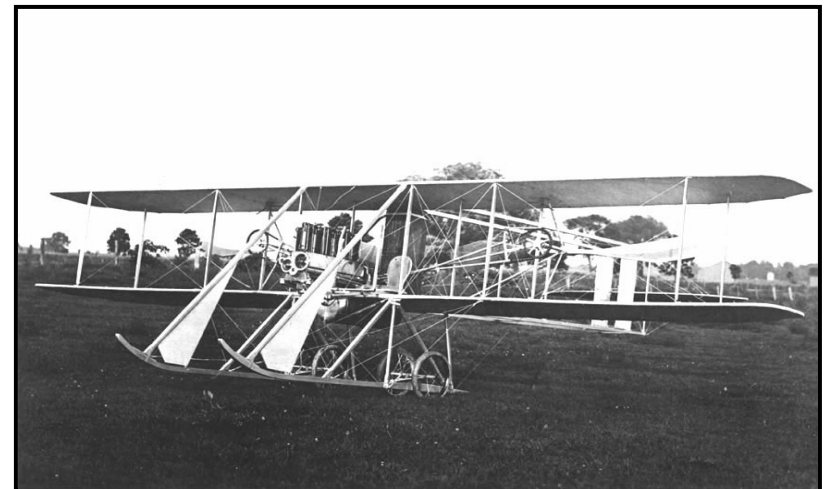
Top Speed: **108 mph**

*Musée de l'Air et l'Éspace Photo*



AMERICA

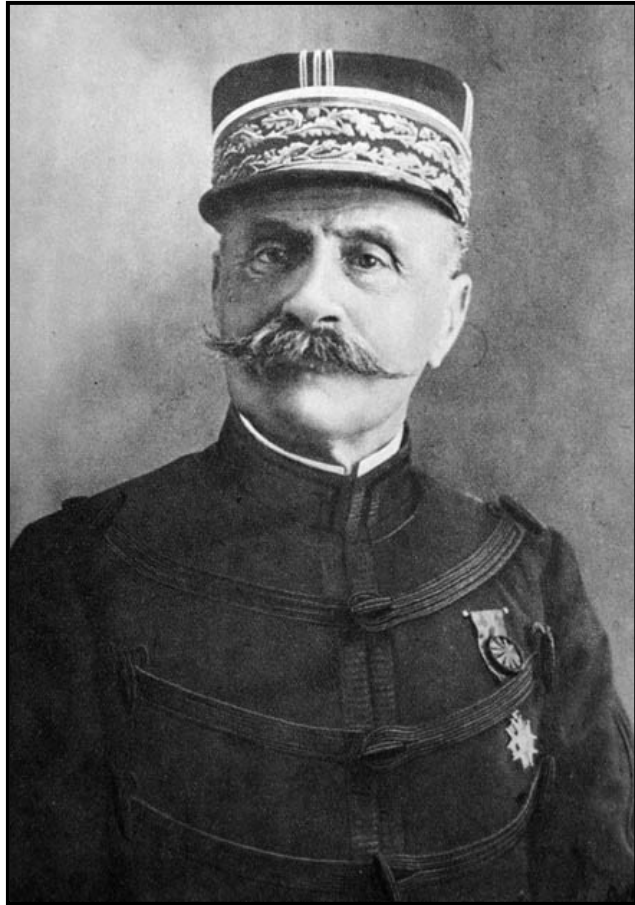
Wright Model D  
*“Speed Scout”*



Top Speed: **67 mph**

National Museum of the USAF Photo

# Foch on Air Power, August 1910



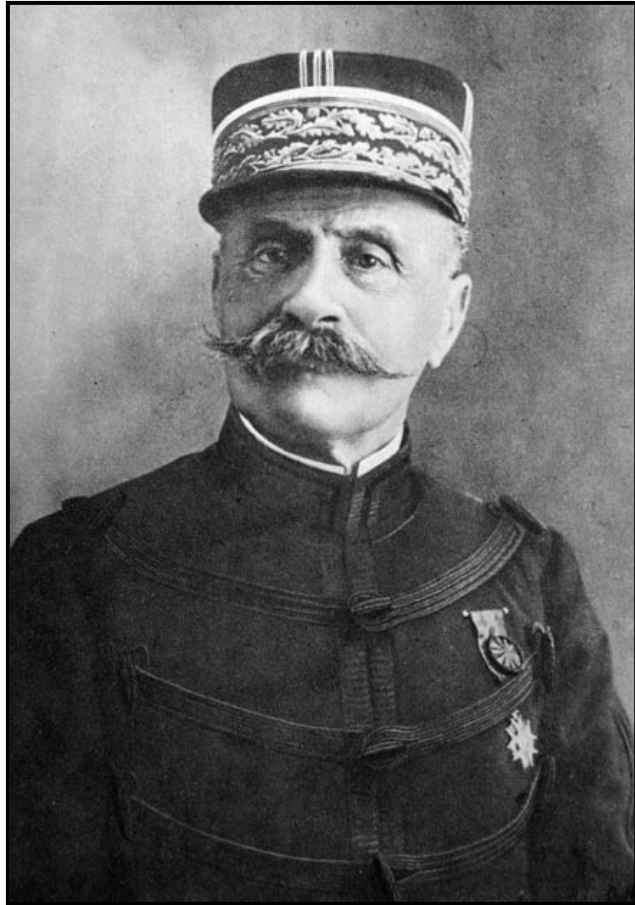
Général Ferdinand Foch

Photo Courtesy Wikipedia

“Aviation has zero  
value for the Army”



# Foch on Air Power, November 1916



Général Ferdinand Foch

Photo Courtesy Wikipedia

“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.**”

# 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)



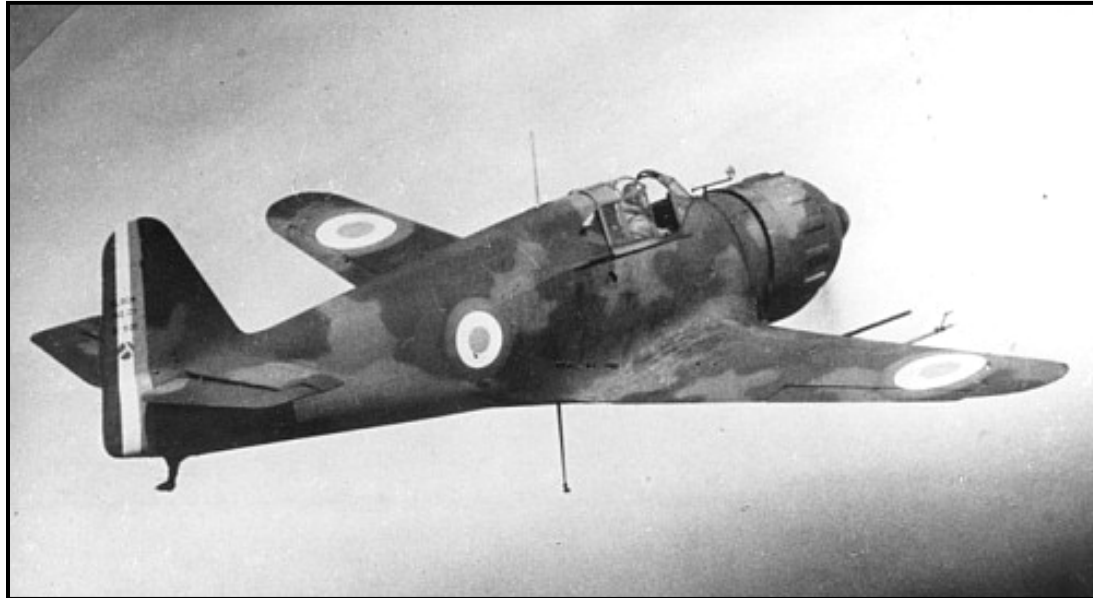
Nieuport-  
Delage  
Ni-D 62  
Biplane  
Fighter

SHAA Photo

“French Aviation is Quite ill.”

--Henri Paté, 1928

# The Decline of French Power (II)



Bloch  
MB 152  
Fighter  
1940

Dassault Aviation  
Photo 91-593

“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)

# Why?

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- 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

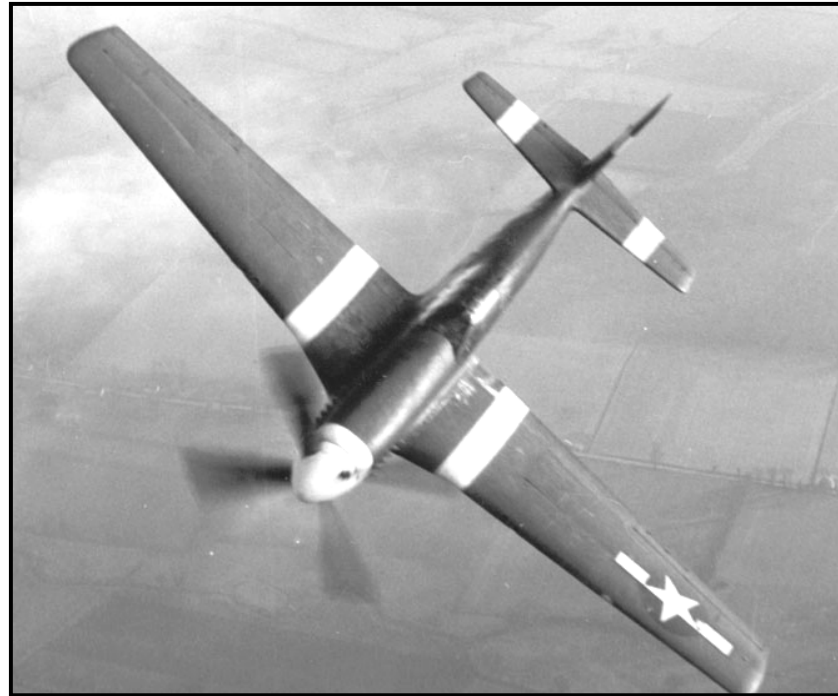
# Why?

- Inadequate Political and Financial Support
- Multiple Service Secretaries and Service Chiefs
- Constantly Shifting Priorities
- Shifting Priorities
- Inadequate Funding
- Social Wariness
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- Army Dominant over Air Force Through 1920’s-1930’s

*...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



# Control of the Air was *the* Essential



Republic P-47  
Thunderbolt  
Fighter-Bomber

“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...

# Overlord: The German Reaction...

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“**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...

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

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“The Anglo-American 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)

Rommel Strafed off  
Road and Seriously  
Wounded, 17 June

# So, Where was the *Luftwaffe*?



Messerschmitt Me 262 jet fighter (1944)

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

# ...Grounded...



Destroyed Me 262s, 1945

AHB MoD UK Photo

but  
Allied Air Dominance  
**destroyed** the  
*Luftwaffe's*  
manufacturing,  
sustaining and  
basing infrastructure,  
**denying it**  
**technological**  
**advantage**

# ...Postwar Air Supremacy...



Global Reach



Global Power



Naval Superiority



Mach 3+ Cruise



Hypersonics



Stealth

# USAF Fighter Development, 1948-1972

Unrealistic Concepts		Aircraft Needing Extensive Work		“Out of the Gate” Successes
XF-85	YF-93	F-84	F-101	F-86
XF-87	F-103	F-86D	F-102	F-4
XF-88	F-104	F-89	F-105	F-5
XF-90	F-108	F-94	F-106	
XF-91	F-109	F-100	F-111	
XP-92	YF-12			
(48%)		(40%)		(12%)



# Southeast Asia...



F-8 Crusader



F-4 Phantom II

USN (top) AFFTC (bottom) Photos

VS.



MiG-17 Fresco



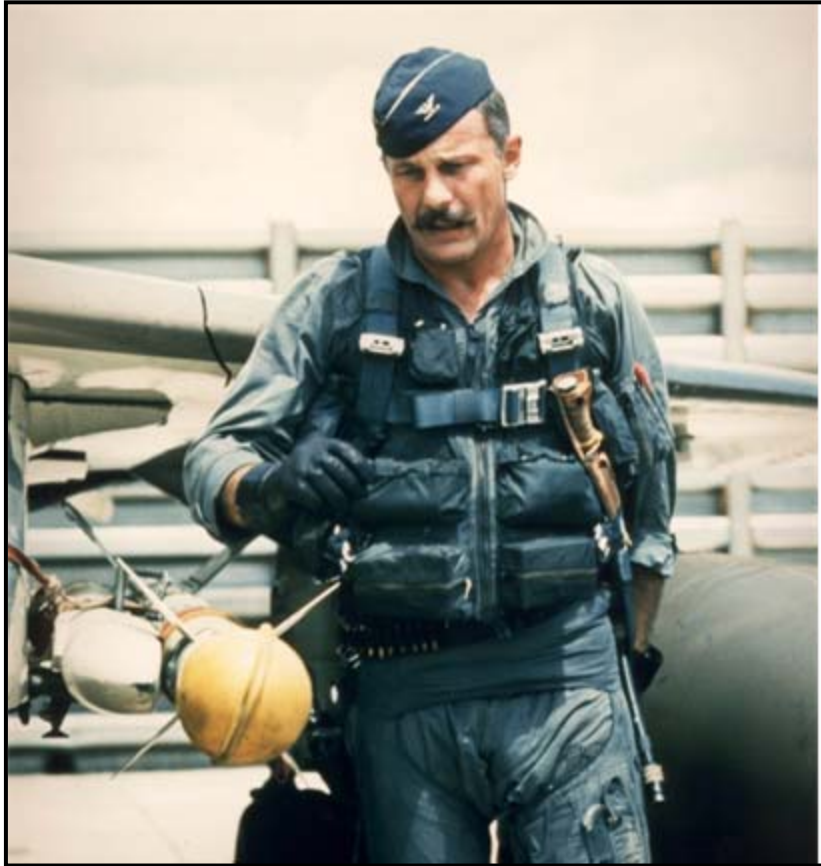
MiG-19 Farmer



MiG-21 Fishbed

National Museum of the USAF Photos

# ...Taught Hard but Beneficial Lessons...



Colonel Robin Olds, USAF

USAF Photo

## SEA Reaffirmed:

Training and Combat  
are strongly synergistic

No substitute for  
experience

Fighters must be  
*Fighters*

Test must be *realistic*

# ...Reshaping the Fighter Force...




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

# “Air Superiority” is *never* Enough...

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- 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...

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- 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

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- 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

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- 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)



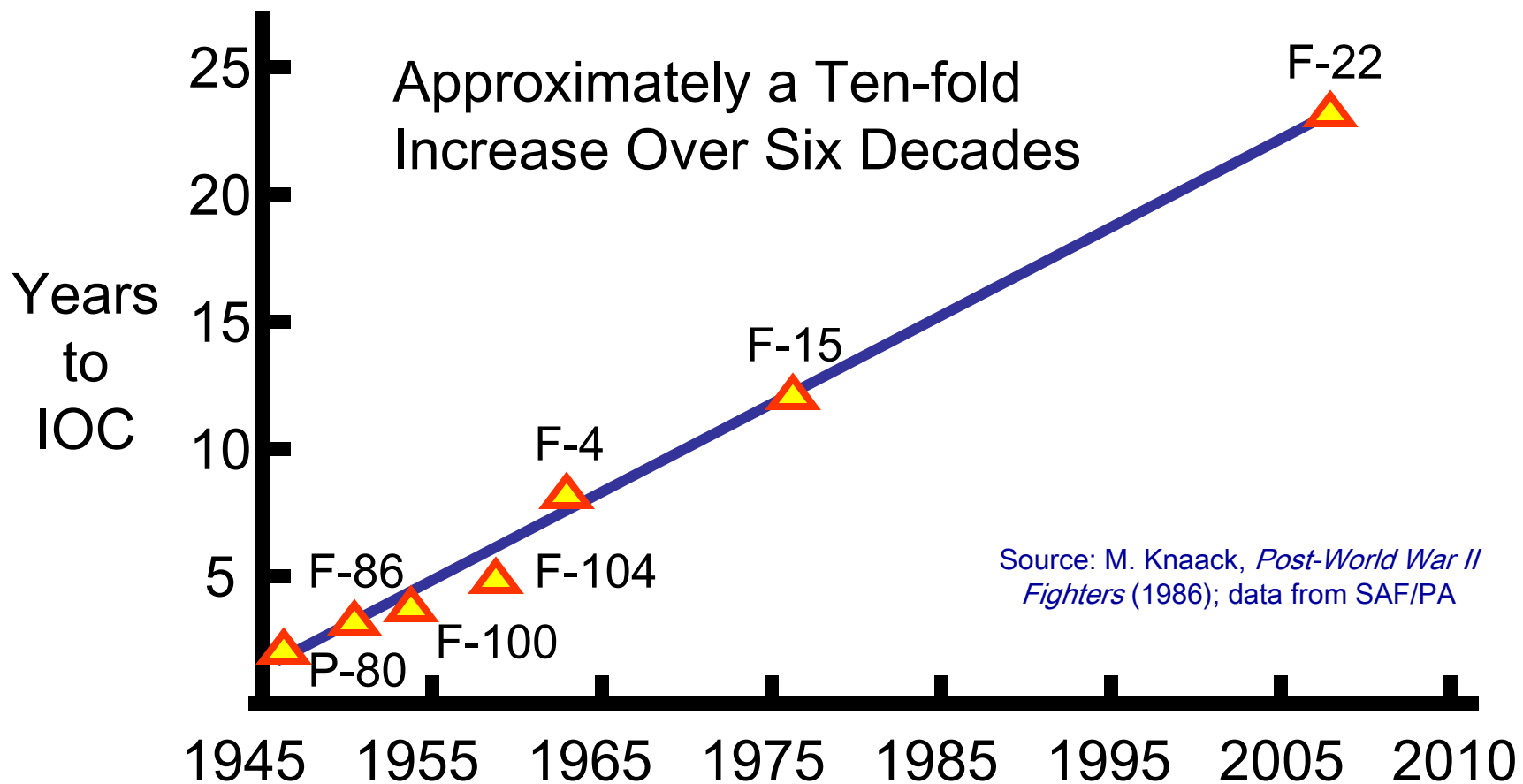
# ...The Broader View...

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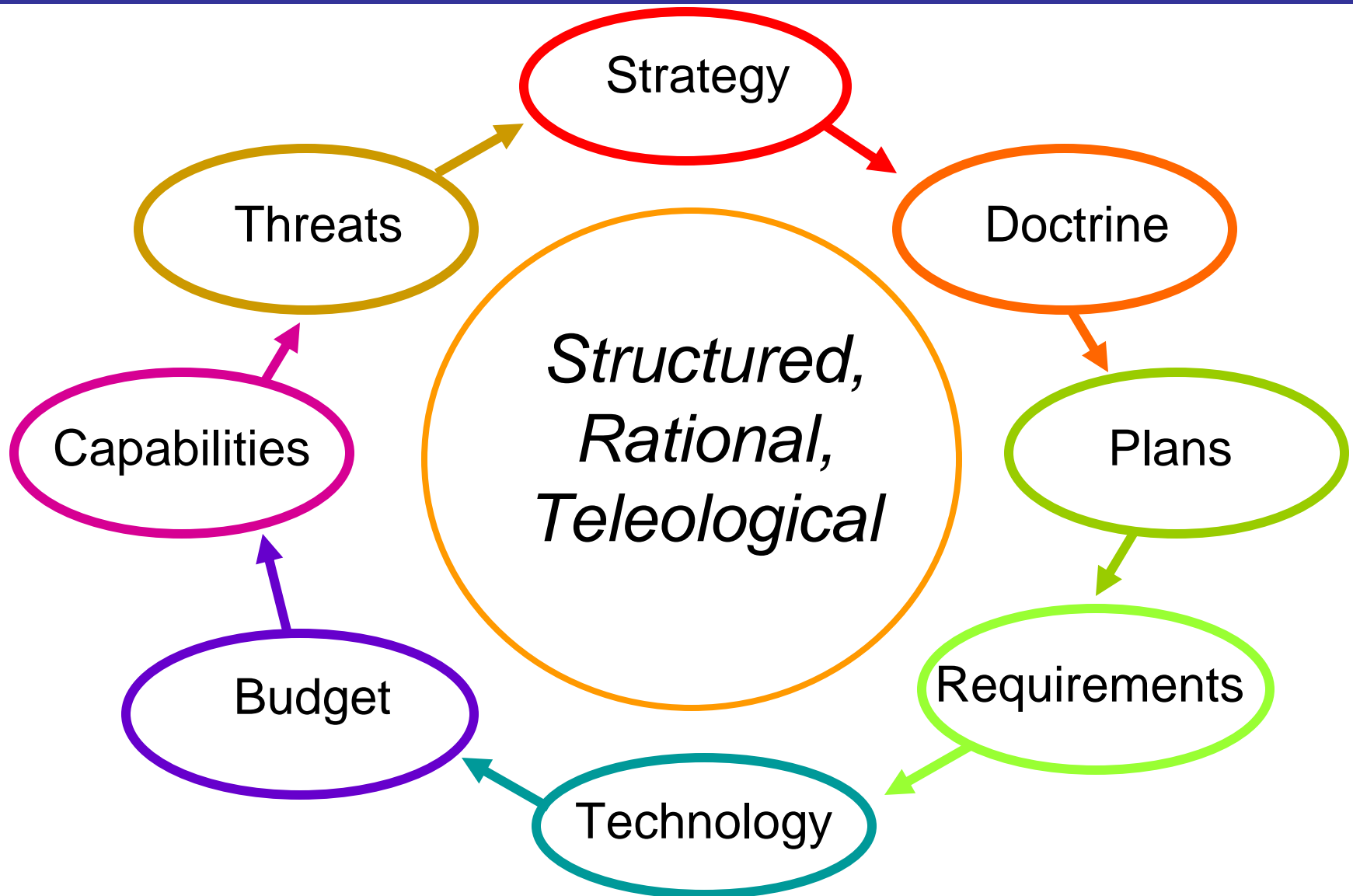
- “Gulf Lesson One *is the value of air power*”:  
--President George H. W. Bush
- “The war in the Persian Gulf *provided a textbook example of what air supremacy means*”:  
--Lt. Gen. Anatoliy Malyukov
- Desert Storm taught us something about air dominance. *We had it, we liked it, and we’re going to keep it.*  
--SecDef William Perry

# ...Increasing Time to IOC...

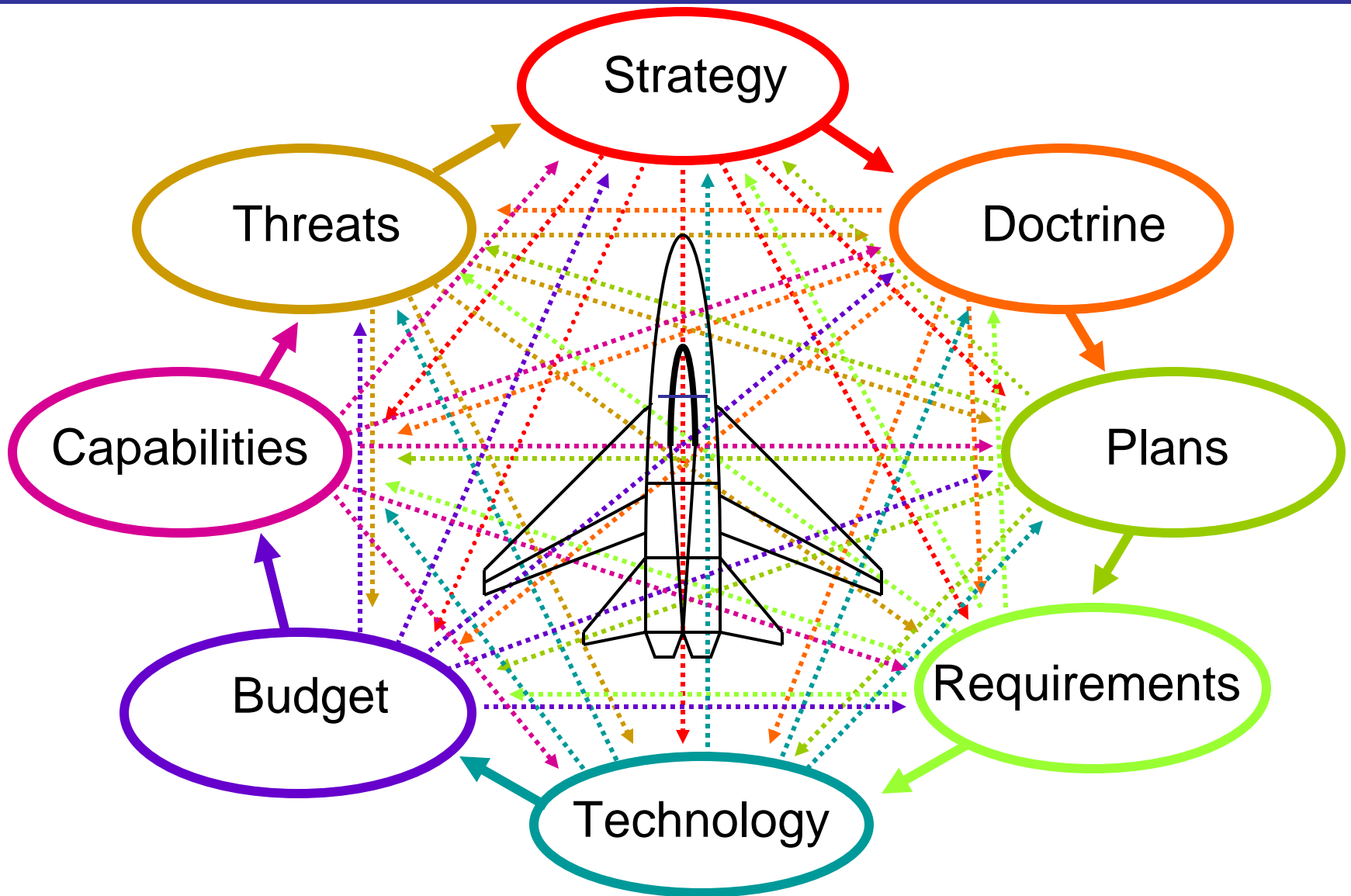
## SELECTED US AIR FORCE JET FIGHTERS



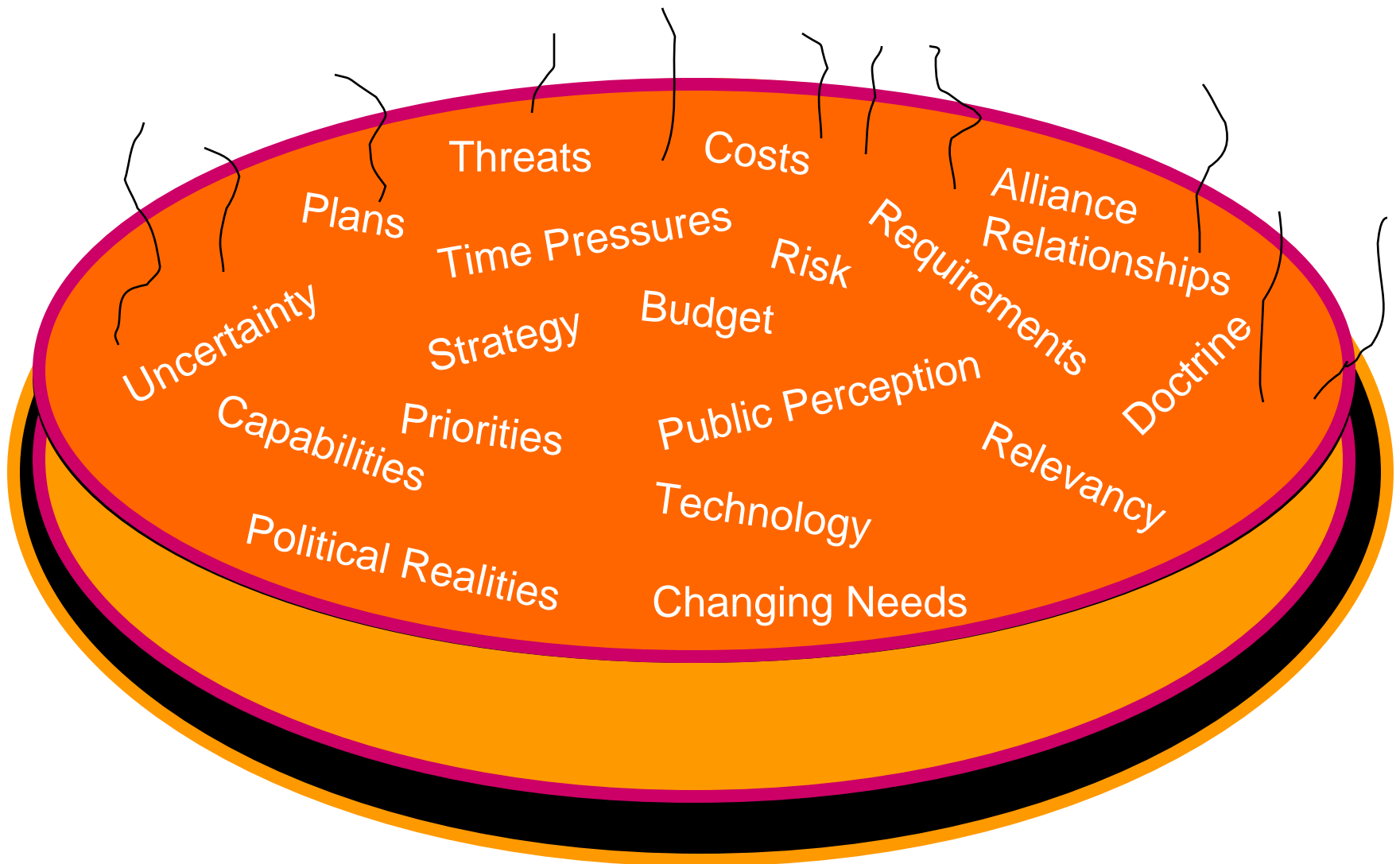
# Acquisition: The “Logical” View



# Acquisition: The “Complex” View



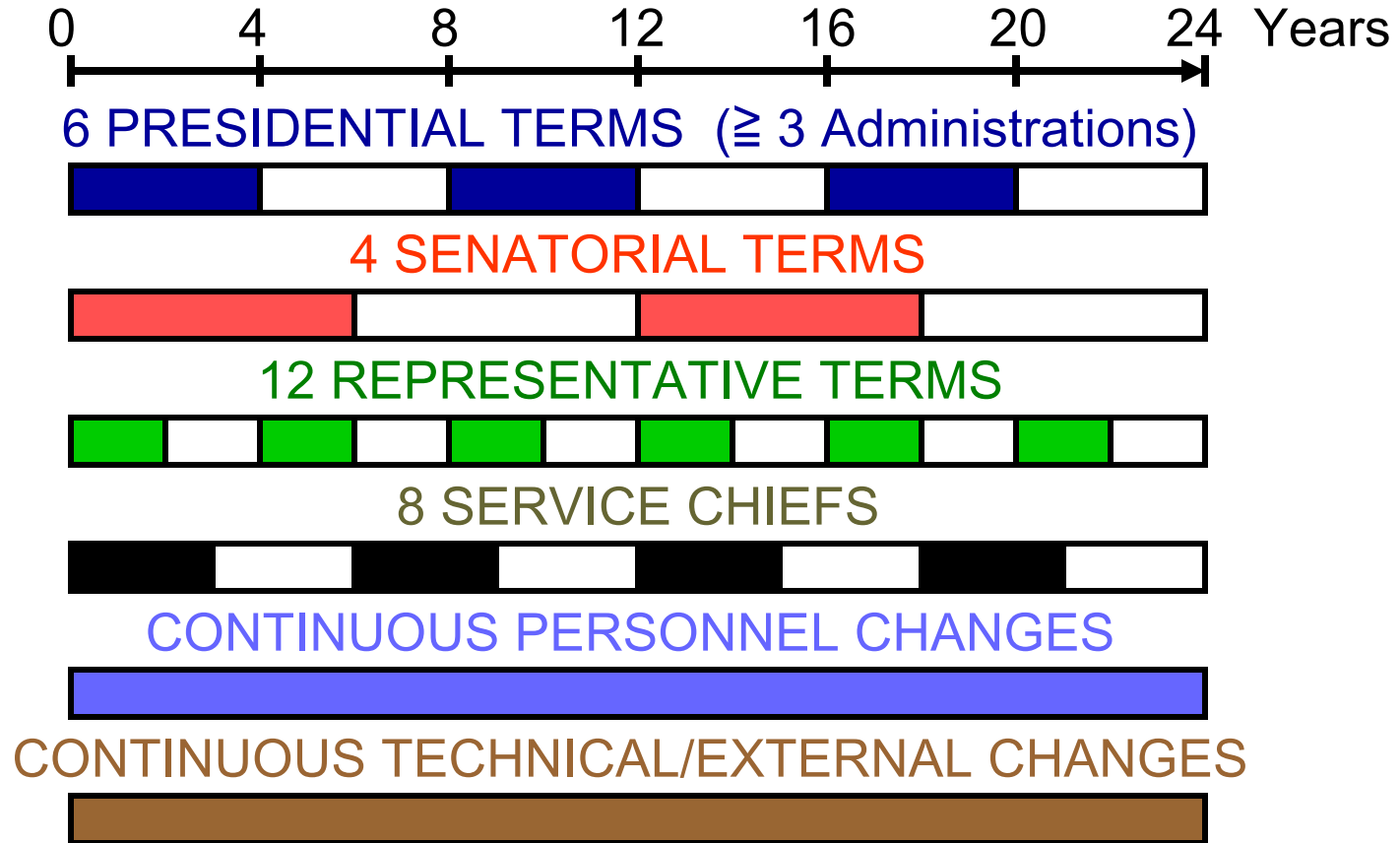
# ...The Acquisition "Soup Bowl"...







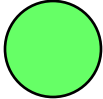

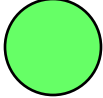

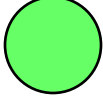



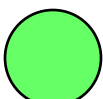

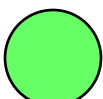



# ...The Playing Field...

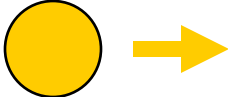
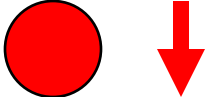
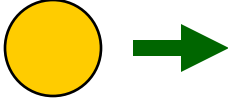





## THE AMERICAN DECISION-MAKING ENVIRONMENT



# A Bicentennial Perspective, 1976

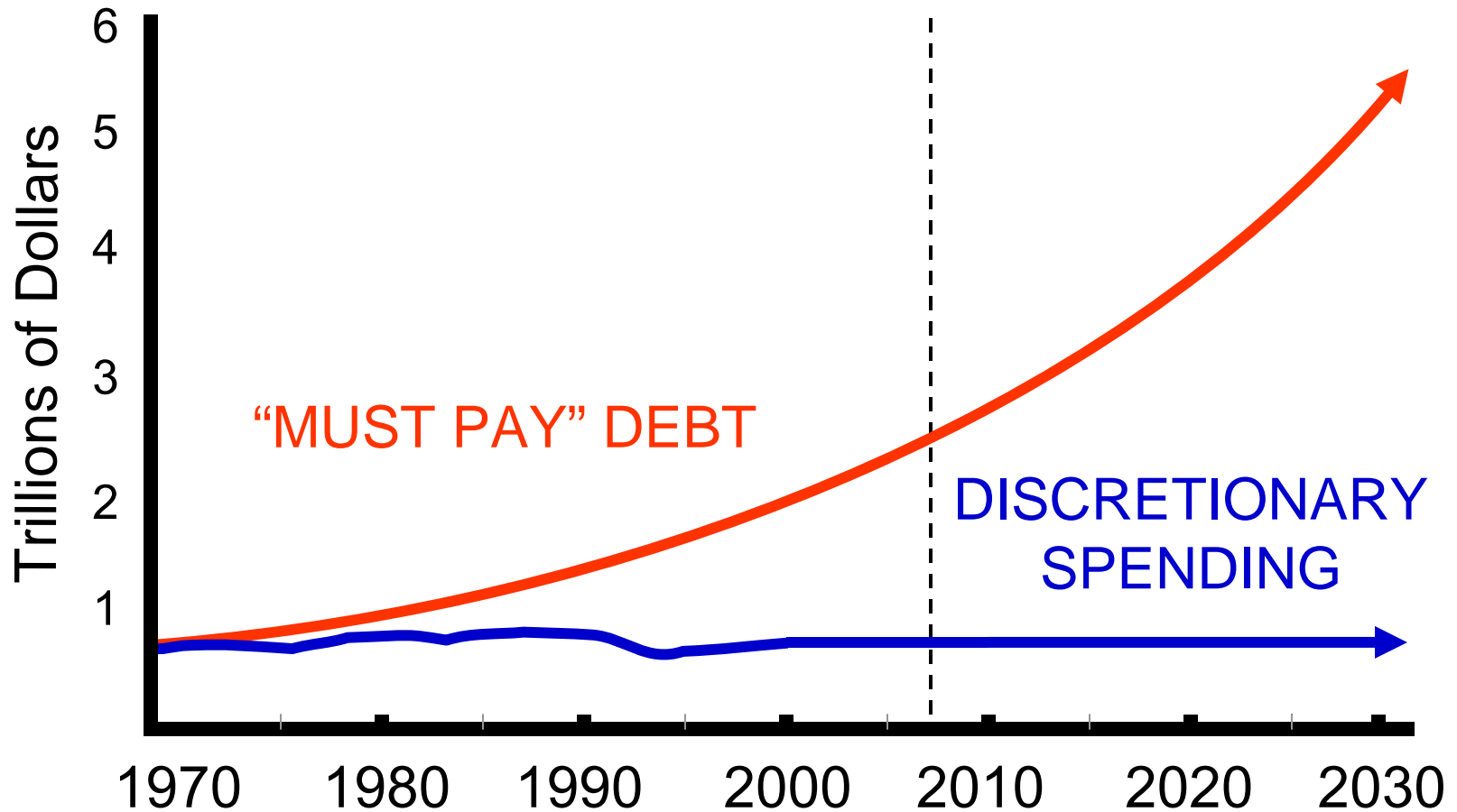
Global Air Transport			<p>The Future Looked Pretty Bright!</p>
Regional Air Transport			
Business Aviation			
General Aviation			
Military Systems			
Commercial Space			
Res./Education/Workforce			
Hypersonics			

# ...and the 2008 Perspective...

Global Air Transport		
Regional Air Transport		
Business Aviation		
General Aviation		An Uncertain, Problematical Future!
Military Systems		
Commercial Space		
Res./Education/Workforce		
Hypersonics		



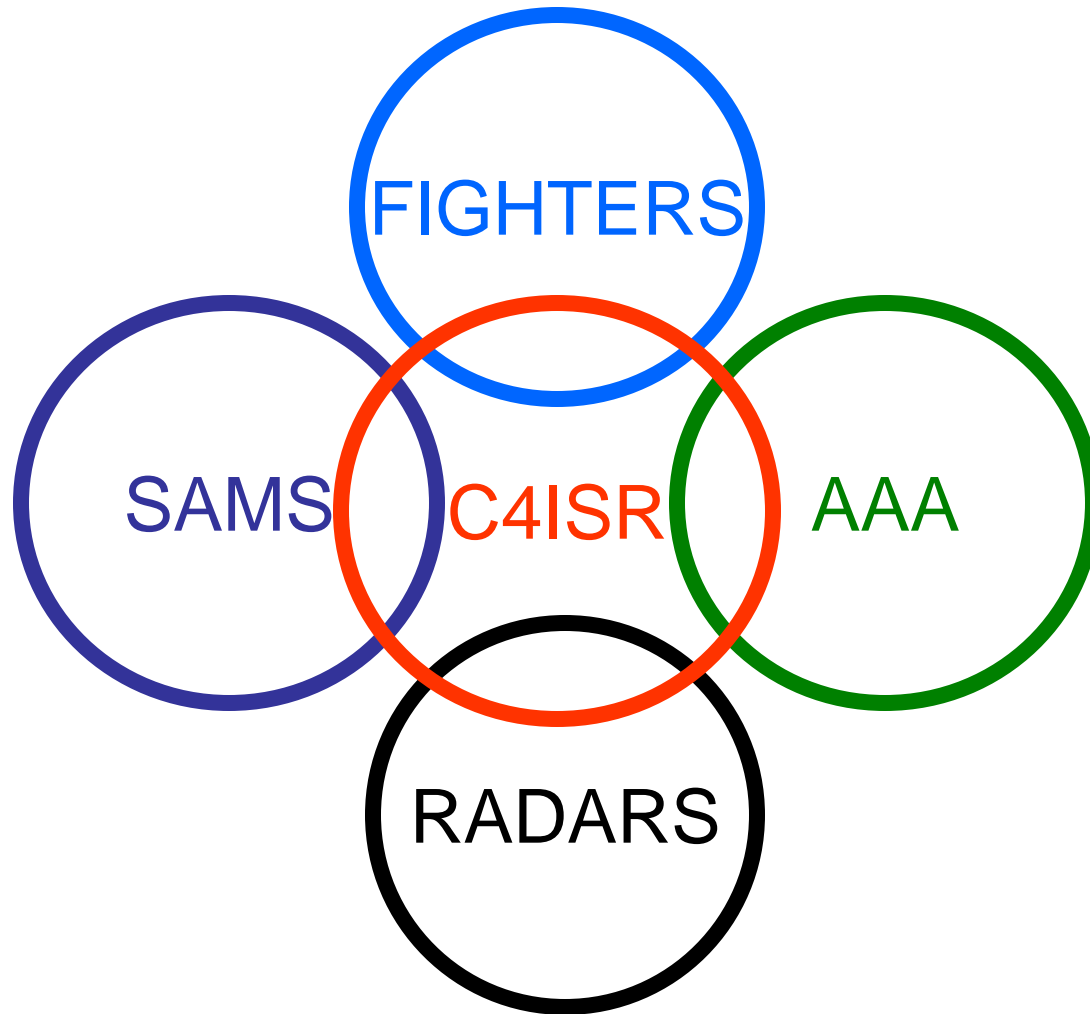
# ...Tough Times Ahead...



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

# . . . Evolving Defenses. . .

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# ...Pose Threats to Air Dominance...



SA-20

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



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

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

# ...For Example...

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

# ...The Legacy Fighter in Perspective...



Average F-15 age: 25.2 years



Average Su-30 age: 6.5 years

**F-15**

=

=

-

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**Radar**

**Weapons**

**Electronic Attack**

**Range**

**Maneuvering**

**Airframe Age**

**Su-30**

=

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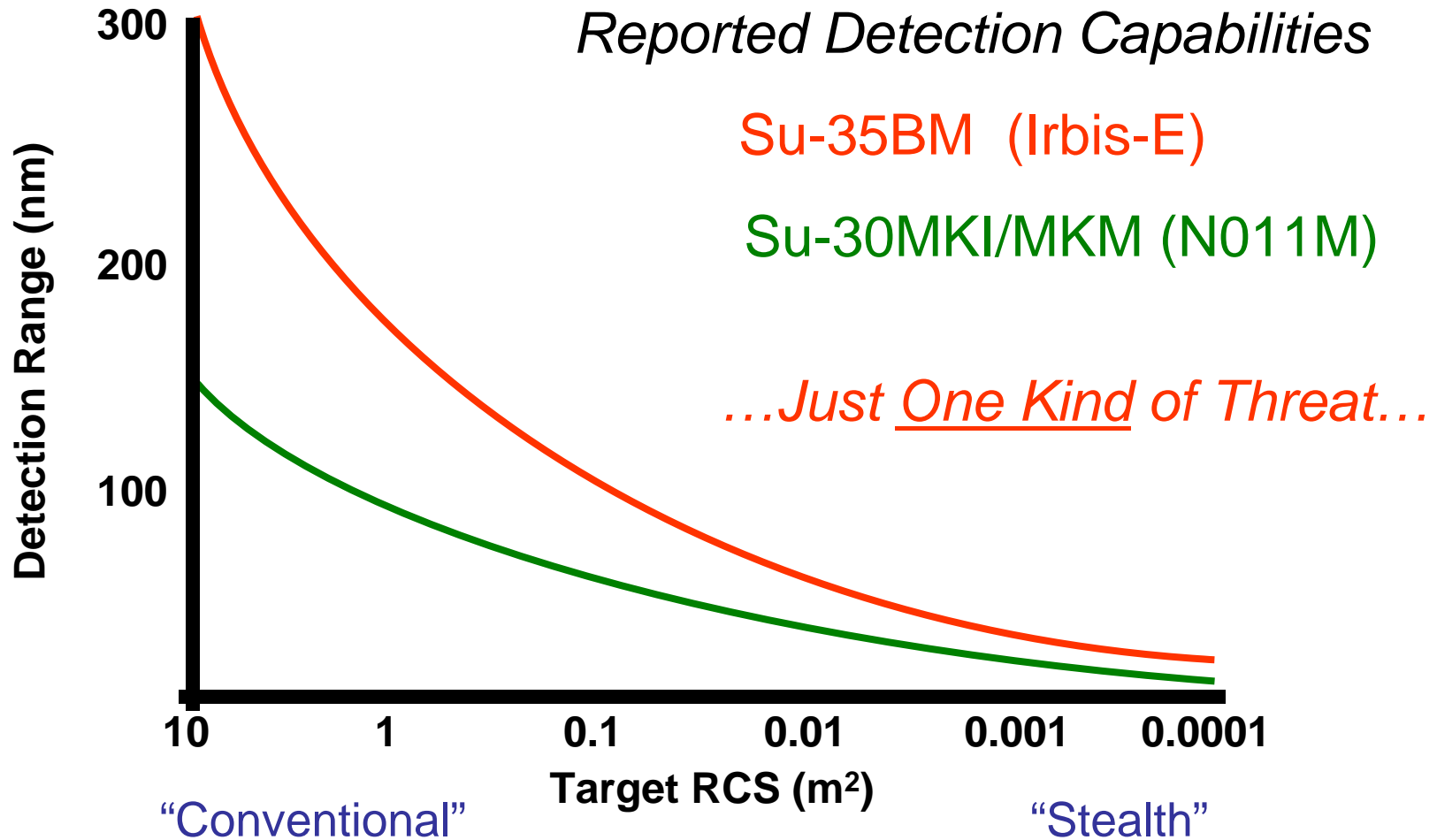
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# ...Legacy Systems are Compromised...



# ...F-22 and F-35 Set the Standard...

F-22 and F-35 have already demonstrated the value of Fifth Generation Fighter Technology...



F-22



F-35



# ...The Sincerest Form of Flattery...



...as evidenced by the  
Russian PAK-FA and  
Chinese XXJ



PAK-FA



XXJ





# ...The Sincerest Form of Flattery...

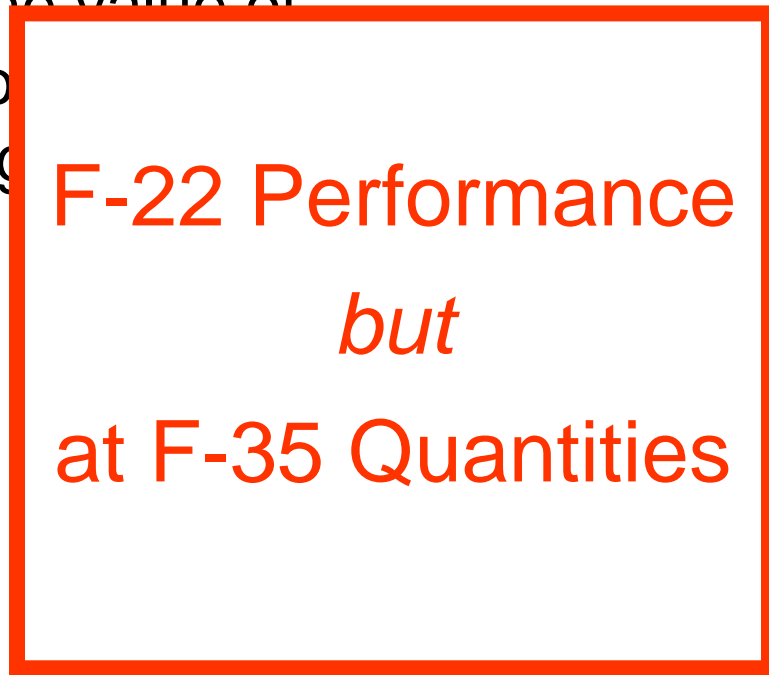
F-22 and F-35 have already demonstrated the value of Fifth Generation Technology

...as evidenced by the PAK-FA and Chinese XXJ

F-22 Performance  
*but*  
at F-35 Quantities



F-22



F-35

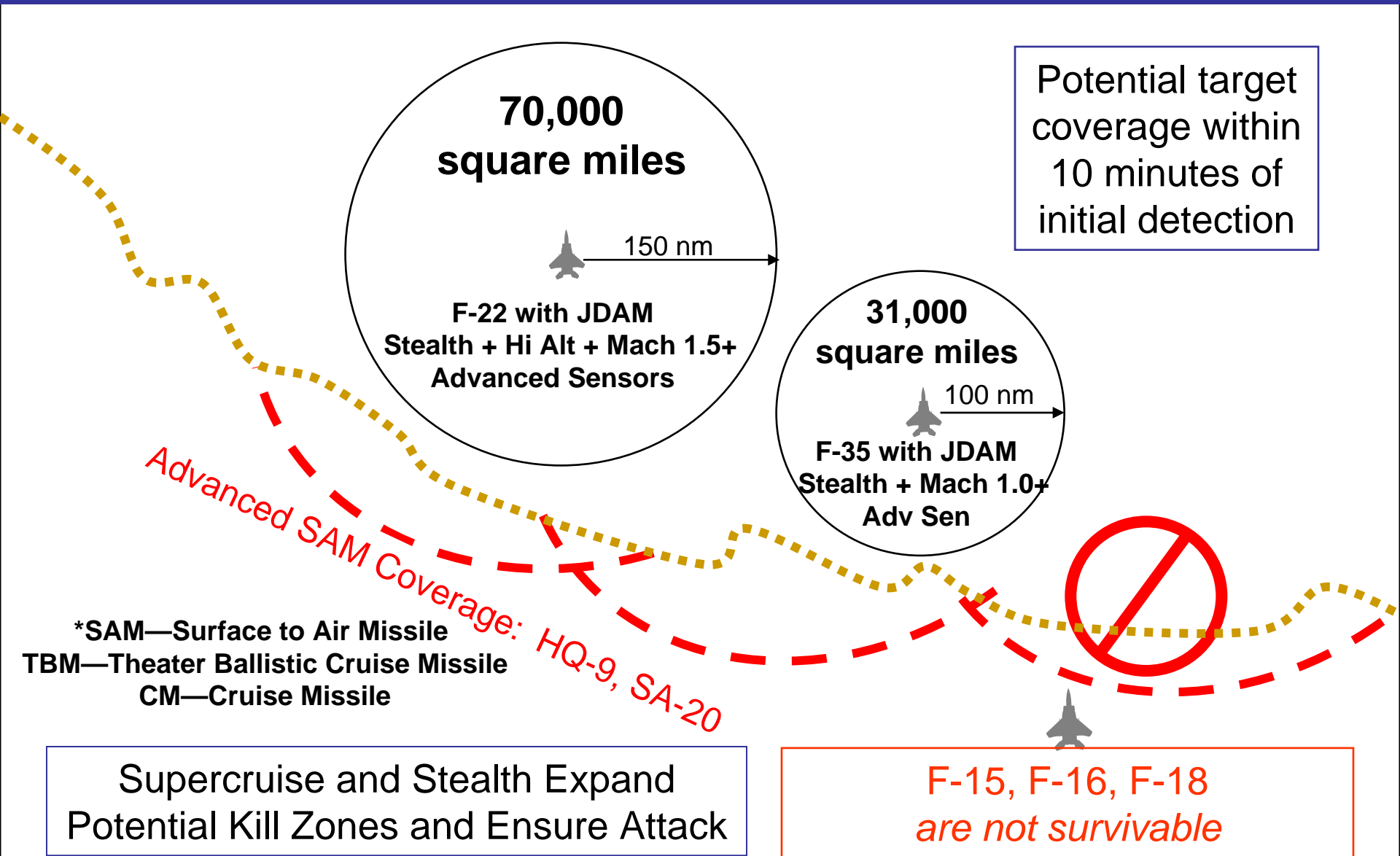


PAK-FA



XXJ

# F-22/F-35 vs. D-D SAMS and TST\*



# With Air Dominance Threats Growing...

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- USAF needs new aircraft to ensure it can meet its **Joint Force** power-projection responsibilities
- Threat evolution requires they have 5<sup>th</sup> Generation capabilities
- Ensuring future Air Dominance requires acquiring the F-22 in meaningful numbers to counter future anti-access strategies

# ...The Bottom Line...

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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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