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AIR  
FORCE  
TRANSFORMATION



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New national security realities have forced us to redefine our enemies as well as our concepts of defense. These new challenges, as well as historic opportunities to exploit revolutionary technologies, underscore the necessity of transforming our military capabilities.

Adapting to this new era is one of our principal missions. We view it as a process by which the military achieves and maintains advantages over our potential enemies, and enables our forces to fight and win, from a major conflict to small-scale contingencies and in every phase of a campaign. What we require is a capability mix consistent with pre-defined operational concepts and effects-driven methodology. We need to develop strategies and concepts of operation appropriate for this new era and rethink our doctrinal approaches to organizing, training, and equipping.

The Edge is a brief introduction to the many transformational initiatives underway within the Air Force and further detailed in the U.S. Air Force Transformation Flight Plan. We are immensely proud of all the Airmen contributing to the ongoing transformation of the Air Force.

General John P. Jumper  
Chief of Staff, US Air Force

# Air Force Transformation...

## What is Transformation?

### Our Definition

...a process by which the military achieves and maintains  
advantage through changes in

**Operational Concepts, Organizations, and/or Technologies**

that significantly improve its warfighting capabilities or ability to meet the  
demands of a changing security environment.

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*“No single piece of this equation is transformational;  
rather, it is the integration of all our capabilities both old and new  
that elevates our operational effectiveness to new heights.”*

General John P. Jumper  
Chief of Staff, US Air Force

# Air Force Transformation...

## Why Transform?

- Exploit new information technologies to revolutionize warfare
- Adapt to new threats to U.S. national security and the unique demands of the future security environment:
  - ▶ Non-state adversaries such as terrorists, drug lords, and insurgencies
  - ▶ Homeland security
  - ▶ Proliferation of weapons of mass destruction



- ▶ Attacks on our space and information assets
- ▶ Cruise and ballistic missile attacks
- ▶ Urban operations
- ▶ Peace operations
- ▶ Unpredictable conflict locations

# Air Force Transformation...

## How Are We Transforming?

Capitalizing on our three core competencies - **Developing Airmen, Integrating Operations** and **Technology-to-Warfighting** - we have developed a broad strategy to implement our ongoing transformation.

We are applying **Capabilities-Based Planning and Programming** and relentlessly pursuing **Innovation** to develop “**Transformational**” **Capabilities** that will enhance **Joint and Coalition Warfighting**. New **Flexible and Agile Organizations** are being created to facilitate transformation and institutionalize cultural change while new **Business Processes** will provide fast, predictable operational support to the Warfighter.

CONOPS

Organizations

Technology



# Air Force Transformation in Action...

## Air Force Concept of Operations (CONOPS)

Through capabilities - based Air Force CONOPS, we are transforming our planning process to make effects the driving force for all our operational, programming, and budget decisions. The CONOPS represent Air Force missions and the capabilities needed to achieve them within the context of joint and coalition operations. Presently, there are seven CONOPS:

### Global Mobility

Provides the rapid, timely, and effective projection, employment, and sustainment of U.S. power through air and space mobility, global command and control, and expeditionary air bases.



### Global Persistent Attack

Conducts and sustains enduring combat operations to achieve campaign objectives with minimal loss through information dominance, freedom of maneuver, and persistent force application.

### Global Strike

Enables the attack of key targets anywhere on the globe on short notice and neutralization of adversary anti-access systems to pave the way for follow-on persistent forces under the Global Persistent Attack CONOPS.





## Nuclear Response

Provides the deterrent “umbrella” under which conventional forces operate. If nuclear deterrence fails, it also provides a variety of nuclear attack options.

## Agile Combat Support

Details the capability to create, protect, and sustain Air and Space Forces across the full spectrum of military operations. It is the foundational and cross-cutting distinctive capability that enables Air Force Operational Concepts and is highly mobile, technologically superior, robust, responsive, flexible, and fully integrated with combat operations.

## Homeland Security

Focuses on defending the homeland; ensuring proactive coordination with local, state, and federal agencies; and projecting forces overseas in a terrorist threat environment and providing for their protection.

## Space and C4ISR

Provides Predictive Battlespace Awareness, facilitates and conducts precision attack, compresses the sensor-to-shooter kill chain, and delivers decision dominance to support joint and combined operations at all levels of conflict.



# Air Force Transformation in Action...

## Organizations

Transformation begins and ends with our people. To continue to transform, we must modify our culture and the processes by which we develop Airmen and institutionalize those changes. Transformation requires organizational concepts that maximize new technological advances. Key examples include:

### Air and Space Expeditionary Force (AEF)

This structure has transformed the Air Force from a threat-based, forward deployed force designed to fight the Cold War into a capabilities-based force flexible to conduct a wide range of operations throughout the world while accommodating the high operational tempo of today's contingency environment.

### Battlefield Airmen

This initiative is transforming the way we organize, train, and equip Airmen who operate outside the airbase perimeter to directly assist, control, and enable precision air power and Close Air Support in the forward and deep battlespace.

### Future Total Force

We are continuing to transform the way we integrate the Air National Guard, Air Force Reserve, and civilian force with our Active Duty force to produce greater, more efficient combat capabilities.



A tactical air control party uses a laser to designate a target during a weapons interdiction mission in Iraq.



## National Security Space Transformation

The Under Secretary of the Air Force was recently empowered as the Director, National Reconnaissance Office; the Department of Defense Executive Agent for Space; and the Air Force Acquisition Executive for Space to create “cradle-to-grave” leadership of all military and national space programs.

## Total Force Development

Through the new Total Force Development construct, our future leaders will have the right education, training, and experiences to better operate in our national security environment.

## Warfighting Headquarters

This initiative will enable the Air Force to better support the Unified Combatant Commanders and actively integrate with the proposed Standing Joint Force Headquarters (Core Element) while simultaneously evolving into a fully joint and combined air and space headquarters.



In Operation Iraqi Freedom, the Air Force Reserve Command flew 50 percent of C-17 and C-5 sorties; the Air National Guard flew 43 percent of Air Force fighter sorties and 86 percent of all refueling sorties.

# Air Force Transformation in Action ...

## Technology

One of our core competencies is “Technology-to-Warfighting,” or translating vision into operational capabilities that allow us to prevail in conflict and avert technological surprise. Some examples of technology concepts that are key to transforming the Air Force include:

### Advanced Energetics

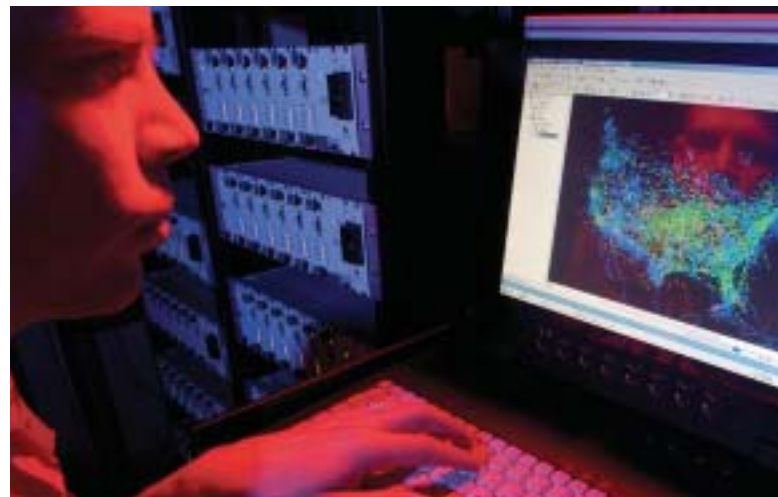
We are exploring advanced energetics for explosives and propulsion. This research will enable future generations of munitions that are safer to handle and deliver more explosive and controlled effects than today’s weapons. In addition, new liquid and solid propellants will revolutionize space launch, satellite propulsion, and aircraft persistence.

### Directed Energy

The Air Force is investing significant resources in directed energy technology, to include lasers and high powered microwaves. Directed energy weapons will allow truly surgical precision, including a variety of non-lethal effects. Additionally, directed energy will support missions such as missile defense, information operations, and force protection.

### Hypersonics

We are experimenting with hypersonic technology that will enable next generation rockets, missiles, and aircraft to operate at speeds above Mach 5. Hypersonics will enable the prosecution of time-sensitive targets in support of global strike and rapid mobility on a global scale. Furthermore, this technology will greatly enhance space access with greatly expanded launch windows, rapid orbital rendezvous, and decreased gross lift-off weight.



## Network - Centric Warfare (NCW) Technologies

The Air Force is working to dramatically increase combat power using Network Centric Warfare technologies. NCW technologies will enable “cursor over the target” execution of the Find, Fix, Track, Target, Engage, and Assess chain by connecting sensors, shooters, and decision-makers. Additionally, NCW technologies will significantly reduce execution times while improving precision and lethality.

## Nanotechnology

We are addressing scientific barriers to miniaturization of components at the nanometer scale. Nanotechnology innovations will yield structures, materials, and devices that have controllable features on the nanometer scale. Nanotechnology will support the development of ultra-small sensors, power sources, and enable revolutions in electronics and computing.

## Unmanned Vehicles

The Air Force is developing unmanned vehicles to support a wide variety of missions. Unmanned vehicles will not only provide options to traditional air dominance missions, but also provide distinctive capabilities such as multi-day persistence and access to dangerous environments. Furthermore, swarming technology will allow unmanned vehicles to autonomously engage dynamic threats.



# Air Force Transformation in Action...

## Transformational Capabilities

We are pursuing 16 transformational capabilities (organized under our six “Distinctive Capabilities”) that the Air Force cannot achieve today or must significantly improve to address the demands of the security environment into the foreseeable future:

### Information Superiority

- 1 Seamless, joint machine-to-machine integration of all manned, unmanned, and space systems
- 2 Real-time picture of the battlespace
- 3 Predictive Battlespace Awareness
- 4 Ensure use of the information domain via effective information assurance and information operations
- 5 Denial of effective C4ISR to adversaries via effective information operations

### Air and Space Superiority

- 6 Penetration of advanced enemy air defenses to clear the path for follow-on joint forces
- 7 Effective and persistent air, space, and information operations beyond the range of enemy air defenses under adverse weather conditions
- 8 Protection and survivability of vital space assets
- 9 Negation of an adversary’s access to space services
- 10 Detection of ballistic and cruise missile launches and destruction of those missiles in flight

## Precision Engagement

- 11 Order of magnitude increase in number of targets hit per sortie
- 12 Achievement of specific, tailored effects on a target short of total destruction

## Global Attack

- 13 Rapid and precise attack of any target on the globe with persistent effects

## Rapid Global Mobility

- 14 Rapid establishment of air operations, an air bridge, and movement of military capability in support of operations anywhere in the world under any conditions
- 15 Responsive launch and operation of new space vehicles and refueling/repair/relocation of future on-orbit assets

## Agile Combat Support

- 16 Significantly lighter, leaner, and faster combat support to enable responsive, persistent, and effective combat operations under any conditions

1900 1910 1920 1930 1940 1950 1960

1914 - 1919  
WORLD WAR I

1939-1945  
WORLD WAR II

1964-19  
VIETNAM

1905  
EINSTEIN THEORY  
OF RELATIVITY

1950-1953  
KOREAN WAR

1923  
TELEVISION  
(CATHODE-RAY TUBE) INVENTED

1946  
ENIAC  
1ST AUTOMATIC  
COMPUTER

1947  
ARPANET

1919  
SHORT WAVE RADIO

1961  
1ST MAN IN SPACE

1939  
RADAR INVENTED

1959  
1ST SILICON CHIP

1ST M...

# AIR FORCE TRANSFORMATION... MAINTAINING THE ADVANTAGE



WRIGHT BROTHERS FLIGHT



NORDEN BOMBSIGHT



X-1



ATLAS



BILLY MITCHELL ON AIR POWER



USAF



SATELLITE COMMUNICATION

WAR BROADENED USE OF AIRPOWER



JET AIRCRAFT



AERIAL REFEUELING



ARMY AIR FORCES



1ST AIR FORCE ACADEMY GRAD



RIGHT TEAM - RIGHT

1900

1910

1920

1930

1940

1950

1960





1970 1980 1990 2000 2010 2020

1973  
WAR  
1990  
OPERATION  
DESERT STORM

1969  
(INTERNET)  
1981  
PERSONAL COMPUTER

1990  
WORLD WIDE WEB

1971  
MICROPROCESSOR

2001  
9/11  
2001 -  
OPERATION  
ENDURING FREEDOM

2003 -  
OPERATION  
IRAQI FREEDOM

"IT'S ABOUT EMERGENT BEHAVIOR FOR AN EMERGING FUTURE...NOT ABOUT BUILDING A BRIDGE TO A PREDETERMINED FUTURE."

ADMIRAL ARTHUR CEBROWSKI  
DIR., OFFICE OF FORCE TRANSFORMATION  
DEPARTMENT OF DEFENSE



GPS GUIDANCE



F/A-22



1ST FEMALE PILOT  
TRAINING GRADS



F-117 STEALTH



PREDATOR



AEF



ABL



AIR MOBILITY &  
AIR COMBAT COMMAND  
ACTIVATED



AWACS



JSF



LASER GUIDED  
BOMB



AIR FORCE  
SPACE COMMAND



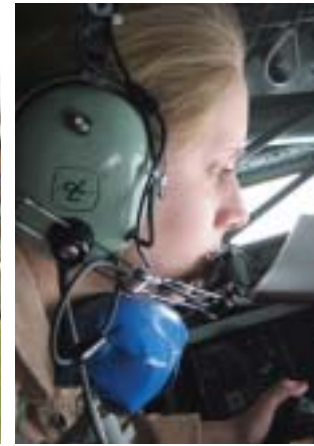
AIR FORCE  
SPECIAL OPERATIONS  
COMMAND

SKILLS - RIGHT PLACE - RIGHT TIME

1960 1970 1980 1990 2000 2010 2020

*"The foundation of the force is our people..."*

Air Force Vision 2020



*"Our goal in implementing our new Force Development construct is to make that investment in all career fields and all ranks more deliberately than we do today in order to better prepare us for the future and better meet your expectations ... Most importantly, we have made sure that this new emphasis reflects a sincere respect for your time – time that you owe to other priorities in your life, like your families."*

General John P. Jumper  
Chief of Staff, US Air Force

# Air Force Transformation...

## Business Transformation

### Transforming How the Air Force Does Business

Air Force business processes stem from an industrial age when America faced a security environment that was vastly different than today's. Although they have been incrementally reformed and modernized, the underlying philosophy and basic architecture of these processes have not changed in decades. They are often labor intensive and lack agility, flexibility, and speed.

To address this, we are pursuing the following goals to transform how we do business:

- Fashion fast, flexible, agile, horizontally integrated operational support processes that enable fast, flexible, agile, and lethal combat forces
- Achieve increased efficiencies through better, simplified, integrated processes and better support tools through a disciplined approach of streamlining processes and eliminating redundant activities

Improved efficiency of business processes should deliver the following effects:

- A 10% shift in business resources to combat operations and modern systems
- A compression of average process cycle time by a factor of 4
- A 20% increase of velocity of people and equipment to combatant commanders



# Air Force Transformation...

## Enhancing Joint Warfighting

Our ability to fight jointly, bringing to bear the most effective combination of forces required for a given situation, is central to transformation. The Services already strongly support each other in many different areas and continue to enhance that cooperation. The U.S. Air Force is also working to ensure joint interoperability, as it continues to transform.

### Joint Enablers

We put a premium on joint enablers. In fiscal years 2004-2009, the Air Force will spend:

- 23 percent of its budget on joint combat forces such as close air support fighters and gunships, loitering indirect fires, and advanced air-to-ground munitions.
- 41 percent of its budget on critical joint force enablers such as air and space C4ISR; airlift; and tankers.

### Improved Joint Operations

We are closely working with the other Services and the Joint Staff to improve joint operations. Some key examples:

- Air Component Coordination Element
- Close Air Support coordination with the Army
- Joint efforts on base protection, countering weapons of mass destruction, command and control, wargames, special operations, and urban operations
- Joint Warfighting Space
- New joint concepts of operation

*“We’ve got to learn to think in terms of integration [so we] end up with a cursor over the target, and we are indifferent to how we got it there.”*

General John P. Jumper  
Chief of Staff, US Air Force

# Air Force Transformation...

## Building Relationships – Enhancing Coalitions

An expeditionary force with a global focus works closely with friends and allies. Today's geopolitical landscape requires interoperable and integrated coalition partners. In addition to contributing important operational capabilities, our coalition partners also provide access, facilities, and bases. Maintaining and enhancing our relationships with allies and coalition partners is key.

### **Cultivating Relationships**

Coalition partners provide forces, complementary capabilities, overflight permissions, facilities, and bases. We establish and expand our relationships enabling global access for expeditionary air and space operations.

### **Coalition Capabilities**

In coalition actions, logistics support and combat capability are critical. We are working with our allies and partners to ensure they are interoperable and integrated with the USAF as it transforms.

### **Combat Aviation Advisors**

Capable friends help stabilize their regions. Combat Aviation Advisors help transform the forces of our allies and friends to ensure they are ready and able.

### **Training, Exercises, and Education**

Training, combined exercises, experimentation, and education further ensure that we are ready to fight in coalition operations.



*Air Force Chief of Staff Gen. John P. Jumper testifies to the Senate how the coalition has achieved total air dominance in the skies over Iraq.*





*“Making the whole team better”*



2005

