Air Force Transformation

Past, Present, and Future

By Maj Gen D A Deptula, USAF*

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The Air Force defines transformation as fundamental change involving three principal elements and their interactions with one another: (1) *advanced technologies* that, because of the new capability they yield, enable (2) *new concepts of operation* that produce order-of-magnitude increases in our ability to achieve desired military effects, and (3) *organizational change* that codifies the changes in the previous elements or enhances our ability to execute our national-security strategy. From the Air Force point of view, military transformation involves much more than acquiring new systems or reacting to failure. It means actually shaping the course of change through aggressive, integrated, and coherent change processes. The Air Force approach to transformation also embraces the notion that we cannot achieve meaningful transformation without integrating our expanding capabilities with those of the other services and elements of national power. In light of this definition, this article briefly describes the transformation the Air Force went through in the early 1990s, is going through today, and is planning for the future.

THE SEEDS OF TRANSFORMATION

The best way to illustrate the Air Force's transformation philosophy is to offer some recent examples.

The Gulf War

Prior to 1991, two separate, leap-ahead military technologies had matured enough to offer an order-of-magnitude breakthrough. The first was low-observable (i.e., stealth) technology, and the second was the development of precision-guided munitions. Together, these two capabilities, in conjunction with an effects-based planning methodology, allowed US forces to execute an innovative concept of operations that has come to be known as *parallel warfare*. Simply put, parallel warfare is the simultaneous application of force across the breadth and depth of an entire theater.

In the first *24 hours* of the Gulf War, US aerospace power launched attacks against over 150 separate and distinct targets – more than were engaged in the years 1942 and 1943 in the Combined Bomber Offensive of World War II and many orders of magnitude greater in terms of force-application capability (a feat yet to be acknowledged in some circles). It had a devastating impact on Iraq's ability to wage war and played a critical role in the coalition's successful liberation of Kuwait – achieved at far less cost in lives than anyone expected before the war began.

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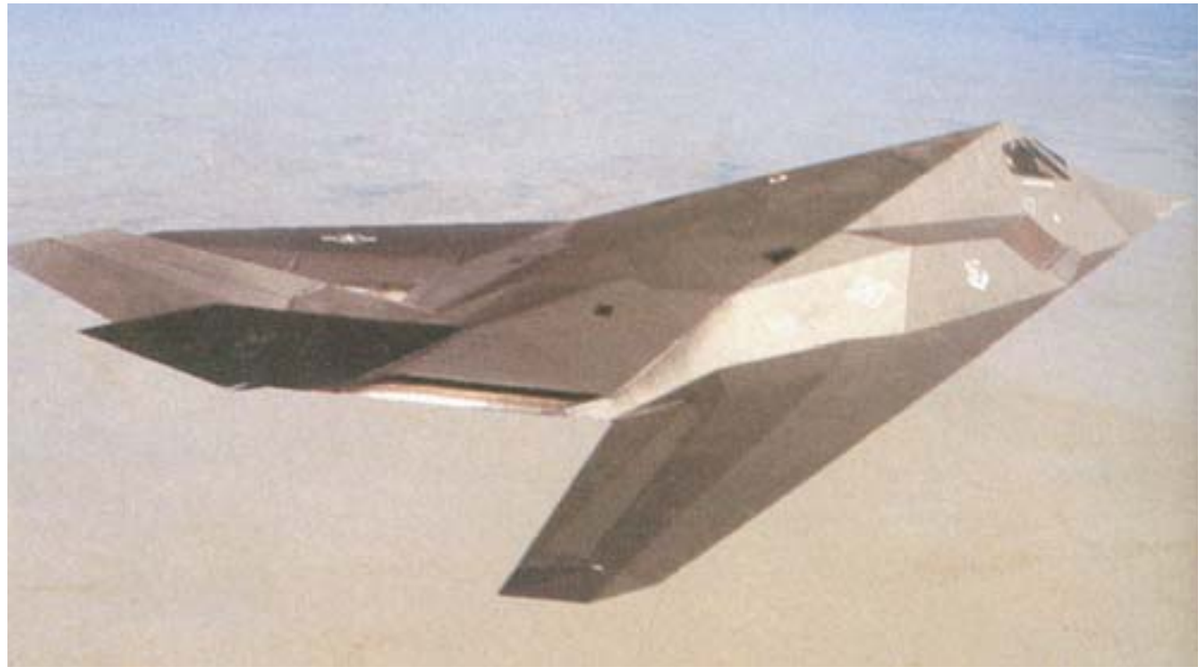

Technology and new operational concepts do not tell the entire story, however. The air campaign that set the conditions for victory in the Gulf War could not have happened without the organizational innovation that emerged from the Goldwater-Nichols Department of Defense Reorganization Act of 1986. That new joint-war-fighting structure allowed the centralized control of American forces through the joint force commander and of all US airpower, regardless of service affiliation, through the joint force air component commander. The results were a lightning-quick victory for the coalition that saved thousands of American and Iraqi lives. These Gulf War

breakthroughs hinted at a larger transformation still to come – one that is still evolving with stealth, precision, parallel war, and centralized aerospace control.

End of the Cold War

Some revolutions have a short shelf life. What seems unique at the time tends to become the norm. America became accustomed to seeing surgical strikes and Iraqi soldiers surrendering en masse – stealth and precision, once revealed, became commonplace. But since change is part of our culture, the Air Force, within a mere five months of the Soviet Union's implosion, stood down the venerable Strategic Air Command (SAC), Tactical Air Command (TAC), and Military Airlift Command (MAC), replacing them with two new, more flexible organizations – the integrated Air Combat Command (ACC) and Air Mobility Command (AMC). This was an organizational transformation stunning in scope for such large organizations. After all, many people considered SAC the ultimate symbol of the entire US military and thought of MAC as merely a support organization. Underlying this dramatic change were the internal shocks generated by the Gulf War, which suggested that a new perspective would better serve the nation. No longer were aerospace platforms either "strategic" or "tactical"; neither were airlift and air-refueling assets simply minor "support" functions. What really mattered was how we used our aerospace assets in an integrated way to achieve strategic, operational, and tactical *effects*.

Throughout the decade of the 1990s, the Air Force transformed itself into a force comprised primarily of precision-capable strike aircraft. It delivered the world's first stealth, long-range, high-payload bomber – the B-2. It fielded a full constellation of Global Positioning System satellites that provided precision navigation to the entire joint force, anywhere in the world. It introduced the C-17, able to deliver equipment, personnel, and supplies directly from the United States all the way to a combat zone – a key enabler no other country possesses.

As the grand national-security strategy of containment shifted to one of global engagement, the United States downsized forces, and deployments and operating tempo skyrocketed. Seemingly temporary deployments away from home became semipermanent. Increasingly, the nation relied on aerospace power to shape the world and respond to all kinds of crises – a practice especially evident in a string of contingency operations in Mogadishu and Haiti;

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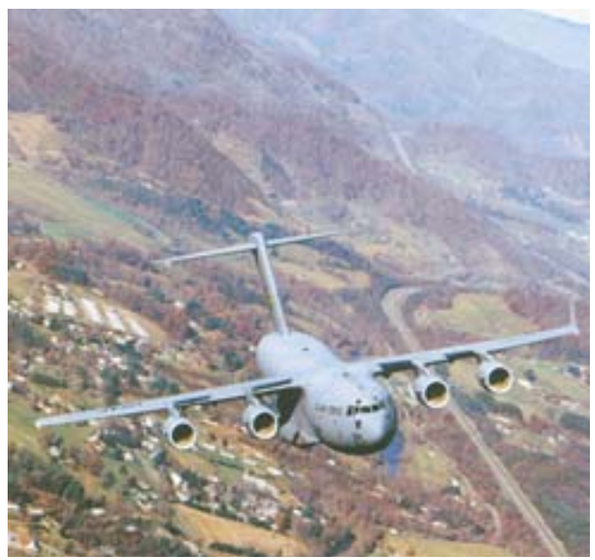

humanitarian and disaster-relief missions in Latin America, Asia, and Europe; and more combat-focused crises such as the Balkans and the maintenance of air-exclusion zones over northern and southern Iraq.

Expeditionary Aerospace Force Concept

The increased operations tempo and reduced force created a strategy-to-force-structure mismatch. This, in turn, led to recruiting and retention problems and then to our second major post-Cold War organizational transformation. The Air Force developed the Expeditionary Aerospace Force (EAF) concept in 1999 to make itself more flexible and to stem the recruiting and retention downturn. The EAF had at its core the formation of an entirely new way of doing business by using 10 separate Aerospace Expeditionary Forces (AEF) in a rotational concept that provided our airmen predictability and stability. In turn, this supplied the theater commanders in chief with fresh, motivated units made up of active, Guard, and Reserve personnel. Whereas the change from SAC, TAC, and MAC to ACC and AMC had provided an integrated and functional organizational structure, the formation of the EAF was more fundamental. It produced a new, expeditionary mind-set in our people.

The Air Force enjoys an unprecedented level of organizational flexibility that originated in its common heritage. Airmen expect change, look forward to it, and thrive on it. Again, these recent changes and breakthroughs all occurred *within our budgetary means* during a time of downsizing and rising operational tempo. So the three elements that define *transformation* came together in the 1990s – the Air Force has been there and done that, not just talked about it. And the transformation continues.

AIR FORCE MODERNIZATION AND TRANSFORMATION

Air Force modernization is based on revolutionary trends first glimpsed in the Gulf War, the deployment challenges of the post-Cold War environment, and our projections about the future security environment. In order to turn those trends, challenges, and projections into reality, the Air Force has instituted a comprehensive, corporate-style process for tying our vision to the future security environment. It is a process that allows for creativity by focusing not on platforms, but on requirements for future capabilities. Good ideas from laboratory projects, war games, experimentation, actual combat, and a variety of other venues feed into our strategic-planning process and are distilled into 14 “critical future capabilities” (Table 1). The programming process then filters programs through those critical capabilities to ensure that the Air Force is staying on course.

Table 1 – The Air Force’s 14 Critical Future Capabilities

1. Rapidly dominate (within days) adversary air defenses to allow freedom to maneuver, freedom to attack, and freedom from attack.

2. Render an adversary's cruise and ballistic missiles ineffective before launch or soon after.
3. Protect our space assets and deny an adversary space capability.
4. Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.
5. Provide deterrence against both coercion and attack from weapons of mass destruction by maintaining a credible, land-based nuclear and flexible conventional strike.
6. Create precise effects rapidly, with the ability to retarget quickly, against large, mobile, hidden, or underground target sets anywhere, anytime, in a persistent manner.
7. Assess, plan, and direct aerospace operations anywhere in near real time, tailored across the spectrum of operations and levels of command.
8. Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battle space worldwide.
9. Ensure our use of the information domain, unhindered by all attempts to deny, disrupt, destroy, or corrupt it; also ensure our ability to attack and affect an adversary's information in pursuit of military objectives.
10. Provide the airlift, aerial refueling, and en route infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis.
11. Build an aerospace force that enables robust, distributed military operations with time-definite sustainment.
12. Build a professional cadre to lead and command expeditionary aerospace and joint forces.
13. Implement innovative concepts to ensure we recruit and retain the right people to operate our aerospace force in the future.
14. Achieve an unrivaled degree of innovation founded on integration and testing of new concepts, innovations, technologies, and experimentation.

TRANSFORMATIONAL MILITARY TECHNOLOGY

The following discussion provides a glimpse of some of the future capabilities the Air Force is pursuing that provide the near-order-of-magnitude increases in offensive capability which mark a true transformation.

Space and Cyberspace

The Air Force is leading the transformation that is occurring in the realms of space and cyberspace. Today, the Air Force manages space systems that provide the nation vigilance, communications, precision navigation, and timing signals that

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synchronize the Internet and enable such technologies as mobile phones and pagers. However, we are transforming our space force into a *spacecontrol force* – one that ultimately will provide persistent intelligence, surveillance, and reconnaissance around the globe. This is an especially important capability as our adversaries move to mobile platforms. Space-based radar exemplifies the kind of system that will allow us to do that. Air Force programs will also prove critical to evolving missile-defense systems with satellite constellations like the Space-Based Infrared System, and the Air Force will provide the critical command and control architecture to make such systems work.

The Air Force intends to move space far beyond those near-term missions, however. The future offers near-real-time global-force application, which will give us the next generation of missile defense conducted from space-based platforms and the next generation of effects-based warfare – in one system. What does near-real-time global-force application mean? It means that when the National Command Authorities (NCA) decide they want to achieve a particular effect, the Air Force can comply within minutes of the decision.

In order to provide that kind of option to the NCA, we need systems such as space-based lasers, combat aerospace vehicles, and space-maneuver and operations vehicles. Coupled with computer-network defense and computer-network attack, they will achieve effects at the speed of light. Again, the focus is not just on platforms but on the way we look at and integrate information technology so we can achieve dynamic battle-space control, integrating and rapidly fusing information from every appropriate source. We are not talking about days or weeks to plan for these operations, as we do today. We want a system that allows adaptive execution in minutes, with precision that can come only from *predictive* battle-space awareness. This type of system changes an entire mind-set – from one that calls for operating in small groups that affect geographically limited locales to one that calls for US and allied forces to think and operate across the entire globe (i.e., global network-centric warfare).

Precision Weaponry

The precision era that started so tenuously in Vietnam has now evolved to an all-weather capability. The remaining hurdles for precision-engagement weaponry are at hand and require aggressive stewardship to make them a reality. The Air Force is pursuing smaller and more precise munitions such as the small-diameter bomb, which will produce a dramatic increase in the lethality of each platform. The next generation of autonomous “seeking weapons” will meet the challenge of moving targets. Their small size and ability to seek, characterize, and precisely attack mobile targets will allow US aerospace power to reduce an enemy’s mechanized formations to dismounted infantry in hours. This has huge ramifications for how the joint force configures itself and fights. Finally, the Air Force is also pursuing directed-energy weapons – the ultimate in speed, lethality, and precision. The airborne

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Stealthy Combat Platforms

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Stealth and precision work together to present our adversaries an insoluble dilemma. The operational implications are obvious, especially against an increasingly formidable air-defense threat consisting of advanced surface-to-air missile systems, but the strategic implications might be even more important. The simple decision to transform our airpower into a predominantly stealthy, precision force will cause our adversaries to change their national-security priorities – it will *dissuade* them from making choices we'd prefer they not make. Today, they have to contend only with a silver-bullet stealth force, but their problem magnifies geometrically if we transform into a primarily stealthy force. Stealth in numbers has *strategic* meaning.

Four platforms will define the stealthy Air Force of 2020: the B-2, F-22, joint strike fighter, and unmanned combat air vehicle. In the air war over Serbia, the B-2 proved its ability to fly with global range and impunity, striking targets in any weather. The F-22 distills into one platform multiple capabilities that in the past required many separate aircraft to accomplish; such capabilities include air dominance, negation of enemy air defenses, precision attack, supercruise, advanced all-aspect stealth, and information integration. This constitutes another leap for increased capabilities with commensurately reduced requirements – similar to what the F-117 offered the nation during the Gulf War. The F-22 has capabilities that *no other aircraft* possesses, providing the United States with a true asymmetric advantage critical to maintaining its sole superpower status. In anti-access environments, the F-22 can operate for thousands of miles with

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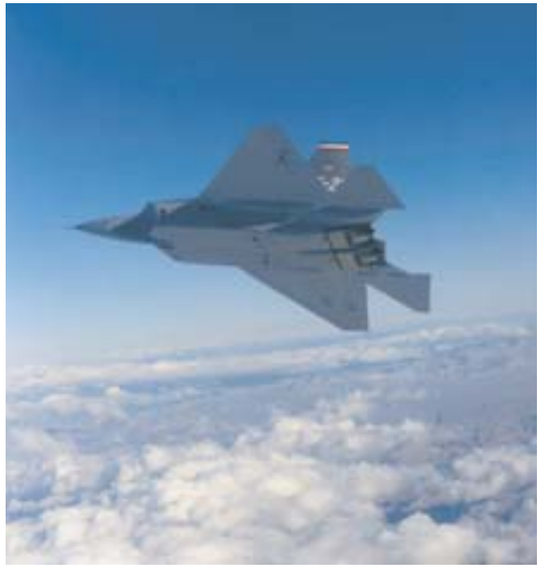

tanker support; unlike legacy platforms, however, it will remain survivable and lethal when it reaches the combat zone. Similarly, while not as capable in all respects, the joint strike fighter can operate in the modern air-defense environment and will also help close the gap in military technology that strains our key alliances – again, stealth in numbers has strategic impact. Finally, the Air Force is aggressively pursuing a stealthy unmanned combat air vehicle as part of an advanced-technology demonstration. Applying lethal force from an uninhabited vehicle is risky, but it is also the wave of the future. That is why, together with the Defense Advanced Research Projects Agency, we are attempting to come to grips with those risks and, through experimentation, turn unmanned air vehicles into lethal systems. Stealthy airpower is a crucial, asymmetrical advantage that the United States cannot squander – we need to capitalize on that advantage to shape our future.

TRANSFORMATIONAL OPERATIONAL CONCEPTS

The Air Force has always been at the forefront of capitalizing on innovative technologies to transform the way the military fights – to leverage those technologies to achieve dramatic leaps in operational capability. The Air Force believes that the huge increases in capability shown over the last decade, as well as those desired for the coming decades, point to new ways of conducting military operations – not only for the Air Force, but also the entire joint force. New joint, operational concepts can provide integration templates for how the United States conducts military operations across the spectrum of conflict.

Effects-Based Operations (EBO)

Providing a perspective for planning, executing, and assessing military operations, EBO integrates other elements of national power to produce effects that compel desired political outcomes. Legacy methods focus on destroying targets, moving arrows on a map, and waging wars of attrition. But EBO moves beyond those narrow, tactical viewpoints. Under this campaign-planning philosophy, the military planner uses superior knowledge to avoid attrition encounters, applying force at the right place and time to achieve specific operational and strategic effects. EBO promotes greater planning agility; it is also less plodding and more adaptive to the achievement of specific effects. Although we have used elements of EBO in the past, through aggressive education and training in these operations, warriors from every service can achieve a more comprehensive framework for integrating all elements of the military – as well as multinational and governmental agencies – into a coherent campaign philosophy.

Afghan delegates from a multi-ethnic council appointed to run the country until June 2002.

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Global Reconnaissance Strike/Global Strike Task Force

Potential adversaries are taking advantage of various methods to deny US forces access to their centers of gravity. We must deny the enemy his antiaccess strategies through the use of stealthy, long-range platforms that can apply precise force with great rapidity. The Air Force has pioneered two operational concepts for crushing antiaccess threats. First, the concept of global reconnaissance strike offers a total joint-force solution for "breaking down the door" to allow follow-on joint operations. Second, the global strike task force outlines the Air Force's key contribution to the joint antiaccess campaign, showing how the F-22/ B-2 team provides indispensable capability for holding the antiaccess systems of various adversaries at risk. These "rapid takedown" concepts constitute the core of our future operational employment against any adversary's antiaccess strategy.

Rapid-Halt Operations

Our interest in global prosperity compels us to retain the capacity for rapidly halting adversary aggression that threatens the stability of the world community. Joint aerospace forces will constitute the key to this capability, which not only provides rapid, global ranging but also plays a huge role in deterring destabilizing behavior. Capitalizing on the precision, global reach, and knowledge provided by US aerospace power, this concept allows for the rapid employment of tailored joint forces to seize the initiative by isolating, incapacitating, and rapidly halting aggression. Using this concept, the Air Force has shown that it can rapidly "swing" forces from one theater to another, allowing fewer forces to conduct more than one major theater war simultaneously.

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Coercive Campaigns

Not all US military operations focus on bringing about an unconditional surrender or forcing a change of regime. In fact, only the most extreme historical cases sought these goals. In the post-Cold War environment, the United States is interested in controlling aberrant behavior and shaping hot spots, not annexing territory. This requires a different military-campaign mind-set – one that focuses on coercing the target nation through coordinated military and diplomatic means. In a coercive campaign, effects-based employment of appropriate elements of national power can modify an opponent's behavior to comply with US strategic objectives.

The theme of all these operational concepts is that new capabilities enable new military approaches that can expand strategic options for both the United States and its allies, while

constricting those of our adversaries. The future demands new operational constructs that take advantage of US asymmetries and offer quicker, less bloody means of expanding global peace and prosperity.

TRANSFORMATIONAL ORGANIZATIONS

On the organizational side of the transformation journey, the EAF must evolve from the Cold War restrictions under which it still labors. The first 15-month cycle of AEF rotations taught us that reorganization alone would not fully realize the potential in the EAF concept. For example, the 10 AEFs are not equal in capability because the Cold War force was never constituted for that requirement. Furthermore, none of the AEFs is independently capable, and many of them have no standoff precision capability; must share stealthy platforms; and overstress certain low-density, high-demand assets.

To fully realize the EAF concept, we must transform it into a force consisting of 10 independently operating, equally capable AEFs. The theater commanders in chief must know that each AEF will deliver a known capacity for command and control, stealthy platforms, all-weather precision engagement, and other key functions. The EAF, however, includes more than our deployable assets. Space; intelligence, surveillance, and reconnaissance; national missile-defense architecture; our nuclear posture; intertheater airlift; recruiting/retention; and our excessive infrastructure all require attention. If the past 10 years are any indication, the future security environment requires a more balanced, fully capable EAF than we have today.

CONCLUSION

Aerospace forces operate as part of a joint, interagency, and coalition team – this understanding drives the Air Force's modernization program. Transformation is a difficult process, but the United States Air Force has linked its modernization plan to critical, future capabilities that will expand the nation's strategic options by offering order-of-magnitude increases in offensive combat capability. It's not just about greater capability – it's about capitalizing on this nation's key asymmetrical advantage to shape our world. In our position as the world's predominant economic and military power, we cannot afford to be reactive – we must invest in success.

What implications does transformation have for our traditional means of analysis and for the metrics we use in judging effectiveness? It is extremely important to adopt a capability-based approach when we make decisions about organization,

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concepts, and system procurement. Cost per unit is often used today as a measure of merit in making such decisions. But a more accurate measure of merit that captures the real value or capability of a particular system is cost per target engaged or – better yet – cost per effect desired. In this fashion, one is led to consider all the elements required to achieve a specific effect. This is particularly important in dealing with stealthy systems. In many cases, although such systems may appear more expensive on a per-unit cost basis than less capable systems, they actually become significantly less expensive in terms of both lives and dollars when one considers all the elements required for alternatives to accomplish a similar effect.

The past decade has proven that aerospace power's inherent speed, range, and flexibility allowed it to make the transformational leap from the Cold War to the demands of the new world. We have a rare opportunity to shape our nation's future by capitalizing on those strengths. As history's only aerospace nation, we have a strategic obligation to fully realize and exploit the asymmetrical advantages of aerospace power. Recognizing the necessity of change, the Air Force is committed to transforming itself to best serve the interests of the United States.

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