

The Air Force's Vector

Joint Surveillance Target Attack
Radar System aircraft being
refueled over Iraq

133rd Airlift Wing (Erik Gudmundson)

By R. MIKE WORDEN *and* MICHAEL SPIRTAS

The sole focus of the Air Force is to carry out national defense policy from the air and space. Its personnel have always played a vital role in helping joint commanders achieve objectives across the range of military operations. Forces operating in these mediums will continue to influence enemy activities in the air, in space, on land, and at sea.

The Army, Marine Corps, and Navy all use air assets, but the Air Force has the most complete perspective and portfolio concerning the development and employment of air and space power. This focus has allowed the service to play a leading role in developing systems and procedures for

planning, controlling, and executing air and space operations.

This article discusses our unofficial view of how the Air Force will contribute to the joint force in the near future.

A Dynamic World

The United States seeks to assure allies and friends, dissuade potential opponents, deter aggression and coercion, and, when necessary, defeat antagonists anywhere in the world. It endeavors to maintain international stability and to redress imbalances in military power that might threaten that stability. In the wake of 9/11, the Nation has placed new emphasis on rooting out terrorist groups with international reach and changing the

behavior of the states that support them.

There is also heightened focus on countering those seeking to acquire chemical, biological, radiological, and nuclear (CBRN) weapons. Moreover, national strategy has placed greater stress on preemptive operations, which require more integrated intelligence capabilities, close coordination with allies, and quick and precise strikes against adversaries before they can strike. The Armed Forces will be prepared to sustain operations in a CBRN environment and take the initiative, if called on, to decisively defeat adversaries armed with such weapons.

During the Cold War, the United States required a large, standing, forward-deployed force capable of confronting the Warsaw Pact and associated threats. Now, instead of a cataclysmic, all-encompassing war with a designated foe, U.S. forces prepare for conflicts with regional powers while conducting

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F/A-22 releasing 1,000-pound
joint direct attack munition
GBU-32 over test range in Utah

83rd Fighter Weapons Squadron (Michael Ammons)

▲ Download above photo as wallpaper at ndupress.ndu.edu.

an ongoing campaign against terrorist groups and other nonstate actors. These tasks are fraught with ambiguity. The nebulous nature of fighting elusive nonstate actors and the difficulties posed by weak and failed states (some either having or attempting to acquire CBRN weapons) have added to the traditional problems of understanding opponents' capabilities and intentions. In addition to the challenges the military has long prepared for, it must be ready for adversaries posing catastrophic, disruptive, and irregular threats.

To meet these emerging challenges, the United States needs the ability to project and sustain power worldwide. Regional powers may concentrate on building capabilities to handle contingencies within their own spheres of influence, but U.S. interests require the means to deliver force and sustain operations virtually anywhere in the world. This necessitates a varied and deep arsenal.

Operational Challenges

The Air Force faces a number of challenges at the operational level. One is a high operational tempo. To meet a steady demand for air and space capabilities worldwide, the service must be able to surge rapidly to supply a large number of assets including Airmen, aircraft, and other systems for multiple, simultaneous contingencies. Responsiveness requires lashing together surveillance

capabilities, command and control assets, and people and systems on alert. Many operational plans rely on Air Force assets to provide the bulk of the joint force's combat power during the critical opening weeks of a crisis, so Air Force units must be ready to deploy with little notice.

Operational tempo has grown since the Cold War. Following the 1991 Gulf War, the Air Force and other services were tasked to

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enforce no-fly zones over Iraq. That commitment, totaling nearly 400,000 sorties, continued as operations over Bosnia commenced in the mid-1990s. The frequency of contingencies then increased further, with Operations *Allied Force* in 1999, *Noble Eagle* and *Enduring Freedom* in 2001, and *Iraqi Freedom* in 2003. Remarkably, all of them occurred during an era when the Air Force experienced an almost one-third reduction in personnel and a significant decline in force structure.

Another challenge regards overseas basing and overflight rights. Access to

established bases and permission to overfly allied territory within and near expected theaters in Europe and Northeast Asia were assured during the Cold War. The locus of conflict has now shifted to areas such as Southwest Asia and East Asia, where distances are greater and political support for basing and overflight is less certain. With the likelihood that there will be little time to prepare for an upcoming conflict, the military will need to be able to conduct long-range strikes, work with coalition partners, and establish, protect, and sustain bases in far-flung areas to provide forward-based airpower.

Opponents who cannot hope to counter U.S. forces directly will have a strong incentive to use other means, including CBRN weapons. They will have a number of ways to impede our forces from deploying to regions of conflict, including ballistic and cruise missiles, surface-to-air missiles, naval mines and submarines, counterspace weapons, mortars, car bombs, improvised explosive devices, snipers, suicide bombers, and other asymmetric means.

The proliferation of robust air defense systems poses another challenge to air and space operations. Adversaries are acquiring more modern surface-to-air missiles, anti-aircraft artillery, and fighter aircraft with advanced air-to-air missiles, creating

integrated defensive systems that seek to deny the ability to operate aircraft over their territory. The Air Force must be able to defeat or suppress these threats rapidly to give follow-on forces the freedom to operate.

Still another challenge is that, while the military has reaped great benefit from harnessing information technologies, its growing dependence on them creates new vulnerabilities. Limited bandwidth restricts the amount of data that can be transmitted. Adversaries know that and are likely to target satellites, the ground systems with which they exchange data, and other computer and communications nodes. Nuclear-capable enemies might also consider high-altitude nuclear detonations to disrupt electronic devices.

Operational Opportunities

The Air Force can capitalize on a number of opportunities to counter the above challenges. For example, the service is highly flexible in its ability to deploy forces. Its air expeditionary force system allows conduct of routine operations while maintaining the capacity to respond to crises on short notice. Units can also be tailored rapidly into force packages of appropriate size and capability to achieve joint military objectives.

The Capstone Concept for Joint Operations lists three joint actions that comprise a common basis for cooperative efforts with other agencies and partners. Each matches up with three longstanding Air Force capabilities: Persistent Command, Control, Communica-

tions, Computers, Intelligence, Surveillance, and Reconnaissance (C⁴ISR), Global Mobility, and Rapid Strike.

Other operational opportunities discussed below fall under all these areas. Through each one, the Air Force helps integrate different elements to make the joint force more potent.

Persistent C⁴ISR

Because they move quickly and altitude allows them to see far away, aircraft have always been used for reconnaissance. The Air Force has led the way in supporting joint force awareness of the operational environment by deploying platforms and sensors that collectively enable U.S. and allied forces to observe large parts of the battlespace. Persistent C⁴ISR gives the joint force and national leadership improved knowledge and better opportunities to deter and engage the enemy. It also provides decisionmakers more situational awareness and hence greater confidence.

Increased awareness spans many arenas. The joint force needs to understand potential adversaries and factors such as weather (both terrestrial and space) that could affect operations. Satellites provide multispectral surveillance of designated areas around the globe. The Launch Detection Center detects and reports launches of intercontinental ballistic, intermediate range ballistic, and theater ballistic missiles around the world, to include the launch of a single Scud. Manned and unmanned Air Force intelligence, surveillance, and reconnaissance capabilities can

also conduct responsive, fine-grained observation in designated areas.

The Air Force commands a network of satellites combined with airborne assets to enable global communications. Some of these

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assets transmit surveillance information to operations centers in near real time. They also transmit tactical orders to combat units quickly and reliably, allowing sensors, controllers, and shooters to communicate with each other, providing better and faster means for sharing information horizontally.

As used in Operations *Allied Force*, *Enduring Freedom*, and *Iraqi Freedom*, this new level of flexibility increasingly allows forces to attack fleeting targets such as mobile missile launchers, tanks, troop transports, and even individuals in motorized vehicles more effectively. It also helps follow up intelligence tips about the locations of enemy leadership. Datalinks allow sensors and shooters to share tactically useful information quickly and accurately.

In Operation *Iraqi Freedom*, the Air Force helped the joint force move from “deconfliction” of operations to a more collaborative, often integrated approach. In that conflict, the newly created air component coordination element worked to increase communication and coordination between the air and land operations, improving both joint planning and execution. Precise interdiction and close air support played an important role in the speed and success of the operation, with weapons delivery within minutes of tasking in most cases.

Air Force units and headquarters are becoming better integrated with other services and with Government agencies. In Operation *Enduring Freedom*, the Air Force worked closely with Special Operations Forces and elements of the Intelligence Community to target Taliban and al Qaeda forces.

In addition to increasing integration between the Air Force, the joint force, and within the interagency community, better communications enhance cooperation with coalition partners. Sharing missile warning,

Special Operations Airmen set up security perimeter after exiting MH-53J at Eglin Air Force Base, Florida



16th Communications Squadron (Andy Kin)

navigation, targeting, and other data with partners helps build the trust that fosters unity of effort.

Global Mobility

The Air Force also extends the mobility of the joint force. Aircraft exploit the vertical dimension above the earth, giving air and space forces very real advantages and making them truly global assets. Aircraft can move at great speed unimpeded by rivers, oceans, mountains, or valleys. Missiles fly at even greater speed and can reach targets anywhere in minutes.

Long-range aircraft at bases in the continental United States, enduring forward bases, and other facilities allow the Air Force to strike centers of gravity within hours of tasking. Aircraft also provide a variety of capabilities, from humanitarian aid to interdicting enemy ground forces to deploying and sustaining joint ground forces.

Leveraging the ability to refuel in the air increases mission endurance, reaches more distant targets, and reduces dependence on bases in theater. Also, mobility allows attack of enemies from multiple avenues. For example, in Operation *Iraqi Freedom*, the joint force used C-17s to deliver 1,000 troops and 40 ground vehicles into northern Iraq, opening a second front despite the Turkish government's refusal to allow the use of its territory for basing or ground transport.

Rapid Strike

Mobility is about the ability to go places quickly. Strike is about what to do when you get there. The development of precision weapons has allowed each sortie to engage multiple targets instead of devoting multiple sorties to a single target. The Air Force is working to disseminate this capability throughout its fleet. For example, in Opera-



99th Communications Squadron (Jeremy Smith)

including minimizing collateral damage. Today's precision weapons can be delivered both day and night, and some are effective in bad weather, reducing enemy sanctuaries.

Greater combat effectiveness helps Airmen accomplish their missions at less risk by reducing the number of sorties necessary to create an effect. Stealth technology, stand-off weapons, and unmanned aircraft also reduce risk. Other emerging technologies, such as small diameter bombs and airborne

measures can have a significant impact on conflict. For example, during Operation *Iraqi Freedom*, the Air Force dropped thousands of leaflets that cautioned Iraqi troops against resisting coalition forces and gave instructions for demonstrating nonhostile intent. Tank operators were advised to point their gun barrels toward the rear and fly white flags, for example. The coalition followed up on the message by targeting personnel who did not comply. These tactics were remarkably effective in reducing the Iraqi threat.

Two particularly important missions can frame the Air Force contribution to the joint fight: defeating aggression by enemy states and defeating threats from nonstate actors. In both, combatant commanders will set a number of tasks. The joint force commander must orchestrate the accomplishment of these tasks, some of which must be conducted sequentially and others simultaneously. Both state and nonstate adversaries can employ catastrophic, disruptive, irregular, and traditional threats to the United States and its military.

emerging technologies, such as small diameter bombs and airborne lasers, raise the prospect of creating effects more precisely and at greater range

tion *Allied Force*, B-2 bombers for the first time dropped joint direct attack munitions on different targets in a single pass instead of one target per pass. By applying relatively new technologies such as the global positioning system and Litening pod targeting systems to old platforms such as the B-52, the Air Force can produce a wider range of effects,

lasers, raise the prospect of creating effects more precisely and at greater range. As counterair capabilities improve, the Air Force has found it necessary to field new strike capabilities such as stealth, supercruise, and advanced avionics to ensure superiority.

In addition to brute force, the Air Force employs more subtle means. Nonkinetic

Defeating State Adversaries

To defeat an enemy state, the joint force must gain and maintain access to the theater of operations, provide protection from attacks, and create conditions to fight the enemy with a high probability of success. The joint force will also seek initially to coerce or neutralize enemy leaders and, in many cases, to defeat or neutralize enemy surface, counterair, and counterspace forces.

Access to the theater of operations involves both political and physical components. During peacetime, combatant commanders build working relationships with military and political leaders across the globe. These activities, often referred to as engagement or security cooperation, include meetings, exchanges, joint and combined training, and large-scale exercises. Combatant commanders engage with foreign counterparts to foster interoperability and to increase the likelihood that these leaders will grant the U.S. military and its coalition partners access to the theater of operations during crises. This access covers a range of activities, from permitting overflight to basing forces, and will involve working closely with other U.S. agencies. In addition to the above activities, the Air Force supports engagement by providing airlift search

and rescue, communications, and other assistance to components of the joint force.

The physical aspect of access includes striking from long range and deploying into the theater itself. Air assets contribute to these objectives because they can move quickly across large distances. In the future, the Air Force will help strike from long range by employing fighters, bombers, the air refueling fleet, and missiles to “kick the door down” where enemies seek to deny theater access. Other Air Force instruments available to joint force commanders to fulfill this mission include unmanned aerial vehicles, space surveillance assets, and standoff weapons.

Joint force commanders must be able to rapidly deploy forces into their theaters. Air assets will continue to play a large role. For example, the Air Force maintains a network of forward bases around the world that helps the joint force deploy and sustain forces closer to areas of conflict. The service has upgraded bases in Diego Garcia, the United Kingdom, and Guam by hardening hangars and modernizing other facilities. Almost all Army troops, key equipment, and critical spares are transported to combat theaters by air. Strike and other aircraft also rely heavily on tanker

aircraft to extend their range and persistence and increase their flexibility.

The Air Force will help all components of the joint force to become more proficient in terms of combat power, while at the same time reducing the amount of support necessary to sustain troops and equipment. Interoperability between joint and coalition partners in this area is growing in importance.

Providing Freedom from Attack

Early in a conflict, the joint force will need to neutralize or destroy the enemy's offensive weapons and their means of delivery as well as protect coalition forces, allied territory, and the U.S. homeland from such threats as ballistic and cruise missiles, aircraft, and terrorist or paramilitary forces. It may also have to prevent the transit of CBRN weapons between states or nonstate actors desiring to obtain such capabilities or defeat adversaries equipped with them. Air Force assets can help by deterring or preventing attacks by aircraft and cruise missiles, denying reconnaissance operations, detecting missile launches, detecting, tracking, and interdicting CBRN weapons in transit, and taking the fight to the enemy.

Marine CH-53 being unloaded from Air Force C-5, Djibouti



U.S. Air Force (Stephen Schuster)

The joint force needs to gain early freedom to attack by defeating enemy air- and ground-based defensive systems. These systems can consist of networks of surface-to-air missiles, radars and other sensors, and anti-aircraft artillery. Other targets in this category could include aircraft and surface-to-surface missile systems.

Air components are well suited to accomplish this task because they can reach into enemy territory to suppress or destroy systems without putting large numbers of forces at risk. Joint forces lost only one manned fixed-wing aircraft and no aircrews to enemy fire during Operation *Iraqi Freedom* in over 41,000 sorties. The Air Force will continue to use stealth, supercruise, and standoff capabilities to set conditions to lower risk for follow-on operations.

By gaining freedom to attack, the joint force can achieve other operational goals. When countering a state aggressor, the force will likely seek to defeat or neutralize the enemy's surface forces. The Air Force has made considerable strides in this area and can now kill almost anything it can find. During the first weeks of *Iraqi Freedom*, for example, coalition air forces compelled Saddam Hussein's Republican Guard divisions around Baghdad to remain dispersed while U.S. Army and Marine forces approached the city. After days of air attacks, those divisions offered no organized resistance. The 3^d Infantry Division did not find a Medina Division capable of a coherent defense. Much Iraqi equipment was abandoned.

Air Force assets have also demonstrated an increasing ability to conduct missions similar to those traditionally undertaken by artillery and other surface fires. Modern air assets have greater range, flexibility, lethality, and accuracy than their predecessors due in large part to integration of network-centric information, varied precision weapons, and better combat identification capabilities.

Air and space forces work in conjunction with surface forces against enemy surface forces. If enemy surface forces mass in response to friendly surface forces, the former risk detection and destruction by air and space assets. In recent conflicts with the United States, state aggressors have avoided massing ground troops above the battalion level because of their vulnerability to airstrikes. If forces disperse to avoid destruction from above, however, they can be defeated by surface forces or at least prevented from operating effectively.

Another objective against a state aggressor could be coercing or neutralizing enemy leadership. By giving the joint force commander the ability to "reach out and touch" enemy leaders and the assets they value, air and space kinetic and nonkinetic capabilities offer a means to remove them, reduce their ability to resist, or convince them to concede without suffering invasion.

Defeating Nonstate Actors

To prevail against nonstate actors, the joint force will need to fulfill another set of missions and apply skills that are somewhat different from those associated with combating state adversaries. There are four key tasks: understanding enemies, identifying them, capturing or killing them, and assisting the forces of friendly countries.

Air Force assets have demonstrated an increasing ability to conduct missions similar to those traditionally undertaken by artillery and other surface fires

One of the most difficult challenges facing the joint force is to understand likely opponents. Nonstate enemies are unlike the Soviet foe against whom the United States once prepared. They view the world far differently from the West, making it imperative to increase understanding of their "operational code." Air Force surveillance systems will be vital to this enterprise. Signals intelligence and other sensors will gather information on global and regional terrorist networks. Air Force foreign area officers and educational institutions have an important role in building this knowledge.

The military is working to improve its ability to locate and incapacitate small groups and individuals, vital when facing a nonstate actor. The Air Force can help in a number of ways. First, air and space assets can provide the surveillance to locate and identify adversaries. Persistent surveillance is critical. After locating adversaries, air assets can engage them in a timely manner. The joint force needs the ability to act with precision to prevent collateral damage, which will be assisted by Air Force integration of manned, unmanned, and space capabilities. It will be necessary to monitor and extract value from a vast amount of information. Once its sensors find something of interest, the Air Force must have the capability to focus on it quickly and pass what is relevant to those able to take action.

Air and space forces provide support to Special Operations Forces, who will continue to play a key role in countering nonstate actors. Air assets give Special Operators the lift to deploy to the theater and will sustain them once there. They also provide intelligence and fire support.

The United States will often work and share information with friendly countries to counter nonstate enemies. In addition to conducting such coalition operations, the military trains with partners and provides advice, equipment, and such assistance as civic support. These activities help gain access by building trust and familiarity. They strengthen state capabilities to counter nonstate threats and demonstrate U.S. resolve. Moreover, they help create a climate that is inhospitable to nonstate actors. The Air

Force will continue to play an important role in these activities, especially in training in airlift, combat search and rescue, attack, and intelligence, surveillance, and reconnaissance.

Given a dynamic and complex world, the best Air Force tool is not technology, but human capital. The service's key requirement continues to be developing people who are more agile, innovative, adaptable, and proactive. By encouraging innovation in the education of Airmen, the Air Force can best increase understanding of the operational environment, the required capabilities for that environment, and the effective employment of those capabilities to achieve operational goals. In short, by investing foremost in its people, and by enlarging cultural and technical capabilities, the service can increase its contribution to the joint force. **JFQ**

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