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Leadership from Flight Level 390

GEN ROBERT H. "DOC" FOGLESONG, USAF

MOST OF THE time, the only chance I have for quiet reflection is at flight level 390—what a delight! So between crisp discussions with some air-traffic agency, here's what I think about the most important part of our jobs: leadership.

We don't do much in life by ourselves. Carrying out big tasks as well as seemingly small ones usually takes a team—and teams need leaders. Leading is a hard thing to do—and even harder to do right. A glance at the front page of any newspaper shows just how challenging it is.

Generally, we have very little patience for bad leadership. Leaders are the first to go when things turn south. That's because they're responsible for what happens in the organization. We hold our leaders to high standards.

We know it takes far more than a good leader to get the job done, but a team will not succeed without effective leadership. It is a critical component. The leader must pull together a group of diverse individuals from various backgrounds with differing proficiency levels and experience. He or she must motivate them to accomplish some specified task, such as increasing profits by 10 percent, building a skyscraper, putting a man on the moon, or winning the Super Bowl.

I have spent the past 30-plus years of my life in the US Air Force for three principal reasons. First, I love America—it's the greatest country on the face of the planet. Second, I love flying—there's nothing like 480 knots. Third, I love leading Airmen—I consider it a privilege to work with them.

Recently, I had the opportunity to talk about leadership with a group of Air Force Academy cadets. A recurring theme in our discussion dealt with how leaders motivate their teams to accomplish their goals. I told them that was the essence of leadership—getting ordinary people to do extraordinary things. I told them they would leave the academy with a fine technical education and would go on to be pilots, engineers, computer experts, and the like, but what they will really get paid to do is lead.

Although I had good leadership-development opportunities during my high school and university years, I was ill prepared to lead when I entered active duty. But over time, I began to

put together a set of skills that worked for me. I had help along the way from mentors who showed me the ropes. I observed good and bad leaders and tried different approaches. Here's what I've learned.

Leadership Style

There are as many leadership styles as there are leaders. Some styles are better than others, but there is no one-size-fits-all approach that works for everyone. Good leaders tailor their approach based on the situation. Are the leaders new to their groups, or have they worked their way up through the ranks? Does the group have a track record of success, or does it have problems to resolve? What are the competency and proficiency levels of its members? Is the group large or small? Is the organization tall or flat? Has it just formed, or are there existing relationships? Is time crunch a factor? These and many other considerations will determine a leader's style. Ultimately, it will depend on the leader, team, and mission.

The Leader

What works for one leader may not necessarily work for another. All good leaders are not the same. They come in all shapes and sizes, with varying abilities and strengths. As a result, leadership style is unique to the individual. It is very much personality-driven. We naturally migrate to an approach that fits our disposition. Anything else would be awkward and forced. A leader's experience and expertise will also affect his or her choice of style.

The Team

Leadership is about people. Successful leaders build and sustain effective relationships with the members of their teams. They know what makes their teams tick, individually and collectively. They understand what motivates them. They find that delicate balance between pushing and pulling their people. They master the complexities and dynamics of their teams. The size and composition of the group will affect how leaders interact with their teams. The larger the group, the harder it is to be hands on and up close. Just as good leaders adjust to their own personality, so do they adjust to fit the personality of their teams.

The Mission

If a team changes missions, the leader will have to adapt his or her style accordingly. The mission is important—it's the starting place. Unless leaders know the mission, they can't lead their people to carry it out. Good leaders begin with the mission and go from there. They posture their teams to meet the specific demands of the task at hand. At times, the mission will dictate a hands-off, leisurely approach to facilitate creativity and innovation. At other times, it will demand close supervision and specific direction to garner immediate action. In the end, it's about finding the right style that produces results. Two questions that leaders inevitably face tend to shape their style.

Does a Good Leader Have to Be Liked?

Some bosses we like working for—others we don't. Some have an even disposition and can make their people feel comfortable. Others raise their voices and are terse, direct, and less nurturing. In my career, I've seen both of these styles work. Leaders don't have to be liked to be effective, but it is better for everyone—including the leaders—if they are. Sometimes they won't have the luxury of being liked—it just goes with the territory.

What leaders must have, however, is respect. Their people have to respect both their technical and leadership skills, or they won't follow them—especially in life-taking or life-saving missions.

How Much Input Should a Leader Get?

Leaders run their teams by consensus, directive, or a combination of the two. A leader who operates by consensus sits down with members of his or her organization and solicits their full input. By the time a decision is made, the contentious issues are off the table, and everyone has full buy-in. Although this

approach is the most conservative, it's also the least likely to produce bold results. It follows the law of averages.

On the opposite end of the spectrum are leaders who use directives. They determine with minimal input what they want to happen and then order its execution. Such leaders do not include members of the organization in the decision making. Because they bypass the time-consuming, deliberative process, things happen quickly. Sometimes audacious, this approach likely will miss good ideas and alienate team members, so many of the decisions have to be undone.

Somewhere between a consensus leader and a directive leader lies an optimum combination of the two—a leader who values his or her team's inputs but isn't hamstrung by indecision. Such a leader surveys the task, looks for solutions, and makes a timely decision. This combination preserves the capacity for quick reaction yet allows healthy discussion. The middle-of-the-road approach is generally the best.

No cookie-cutter method exists because different situations require different approaches. This type of situational leadership is a smart way to do business. It makes sense for leaders to tailor their approach with varying degrees of consultation, empowerment, and supervision, based on the group they're leading and the task at hand.

Common Characteristics

Although leadership styles vary, depending upon the situation, all good leaders have certain characteristics in common. These traits are prerequisites for successful leadership.

Good leaders hate to fail because they are deeply committed to the task before them. They refuse to accept failure. This desire to succeed is driven by intense pride, which forms the foundation for successful leadership. Specifically, every good leader shares seven qualities: *p*reparation, *r*espect, *i*ntegrity, *d*iscipline, and *e*nthusiasm, plus morality and courage (PRIDE Plus Two).

Preparation

Good leaders do their homework. They lay the foundation for success by learning the technical aspects of their jobs. Leaders must have technical proficiency in the team's business. They don't necessarily have to be experts, but they need a certain skill level to remain credible. The team captain of a basketball team must know how to play basketball. Similarly, the commander of a fighter squadron must be a credible fighter pilot. A good leader also prepares by building an early working knowledge of his or her team members—their challenges and opportunities. What are their responsibilities, and who are their partners? Where does the team fit into the bigger picture? Lastly, good leaders spend time learning human behavior because people skills are critical to leading.

Respect

Good leaders respect themselves as well as their teams and competitors. Never arrogant or boastful, they stand their ground and carry themselves with authority. They demand as much of themselves as they do of their teams. Although demanding, they are never demeaning. They understand what every member of the team brings to the fight. They value their inputs and create an environment in which all are welcome and comfortable.

Integrity

There is no gray area when it comes to integrity—it's foundational. Leaders cannot succeed if their people do not trust them. If they bend the rules and say what is convenient, they may succeed in the short run but inevitably will come up short in the end. Good leaders fight to protect their integrity. Once they lose it, they can never get it back.

Discipline

Effective leadership requires both personal and professional discipline. The people behind leaders must admire the way they run their personal lives. Good leaders do those things

we expect responsible folks to do: stay healthy, balance their checkbook, and take care of their relationships. They have to follow the very rules they make. If they're not willing to stick by them, then neither will the rest of the team. We call this having a good work ethic. But good leaders also know when they need a break. They are no good to their teams if they are sick, run down, or distracted.

Enthusiasm

Groups take on their leaders' personalities. If the leader is excited about the mission, so is the rest of the group. Enthusiasm is contagious. No leaders worth their salt are dull. Leadership requires passion and fire. People have to believe in what they're doing, and they have to do it with zeal. Good leaders must convince their teams that what they're doing is important. They do that with energy and passion. If leaders are not passionate about leading, then they probably ought to find something else to do.

Morality

The importance of having good morals may sound simple, but it's not. Leaders must know right from wrong. There is no compromise here. Sometimes they simply have to lay the marker down and take the heat for standing their ground.

Courage

In the end, none of this matters if leaders don't have the courage to pull the trigger. They must be willing to step up and execute. Courage is the most undernourished of our core values, yet it is the most critical. All the values that we routinely discuss—faith, hope, charity, and so forth—don't mean anything unless we have the courage to execute.

Strategic Leadership

The way leaders take command or take charge of an organization is important. They must have a strategy and must think through big issues before they begin. If leaders take the time to develop a game plan before they start their jobs, they will not just respond to events as they happen but will direct the success of their organizations.

Vision

Leaders must first have a clear understanding of where they want their organizations to go. This vision will set the baseline for everything they hope to accomplish. It's the first and most critical step. Without it, they will allow others to set their priorities and end up having the immediacy of the task determine its importance rather than having the importance of the task determine its immediacy. They should refer to the vision periodically to ensure that their organizations stay on the path they chose. By the way, everyone in the organization must understand what the vision is. Leaders have to keep things simple, avoiding a level of detail that would be confusing.

Mission

Subsequently, leaders must develop the means of getting to the ends they envisioned. This is their mission—I mentioned its importance earlier. The mission is the meat of the vision. It's every leader's purpose. In the mission, leaders flesh out what they want to accomplish or what they've been tasked to accomplish. Every organization must have a clearly defined mission. Without it, leaders will find themselves adrift. All members of the team must be able to articulate why they are there—what their function is. That's what the mission does for leaders.

Goals

Leaders should then take the process one step further by setting specific goals—the measures for gauging whether or not they're getting close to fulfilling their mission. Leaders won't have all of their goals when they start, but that's okay. They should maintain a healthy degree of flexibility when they formulate their goals. Leaders' goals will grow and change over time as they get feedback from their

teams. Good leaders must also be sure they don't set goals that don't match their mission.

Tactical Leadership

Though essential, strategic leadership can only take you so far. Effective tactical leadership is required to ensure that the mission is executed efficiently on a day-to-day basis. An effective leader must facilitate strong two-way communication, create an environment that fosters success, equip his or her people, and hold them accountable to high standards.

Communication

Establishing and sustaining good communication is difficult but essential to success. Leaders must be able to take what they have inside their heads and transfer it to the people behind them. Followers must understand and be clear about what's expected of them. Leaders have to make sure that the guy at the bottom of the organization chart gets it. Certainly, the front-line managers or team leaders must know what the expectations are—but that's not enough. Leaders have to mechanize in such a way that the word gets out. They can't stop at one level down. This takes time and energy. Leaders must be wary of getting bogged down in the details and forgetting to broadcast their message to the organization. They have to let their people know that they are thinking about them, and team members have to know that their leaders aren't just in it for themselves.

Listening

This is a two-way street. After leaders send out their messages, they must listen for responses. They must talk to their people on a routine basis and find out what's going on in the organization. Good leaders sit down with their people in the dining facility, spend time on the work floor, and get out of their offices. Folks will be brutally honest if they're afforded the opportunity. Leaders should also put a human face to their policies and programs. Doing so will make them better leaders, and their organization will progress as a result. It is important to avoid being accusatory or defensive as people give honest feedback. When leaders sit with their team members, they should remind them of their importance to the success of the team. One caution—effective leaders don't let such meetings turn into gripe sessions about supervisors. They should support the leadership team.

Environment

The leader is responsible for the climate of the organization. A group will not function, much less succeed, if the members of the team are threatened, uncomfortable, or mistreated. There's no room in the workplace—or anywhere else—for intolerance. Leaders have to talk to their people repeatedly about equal opportunity, fairness, sexual harassment, and other inappropriate behavior. They cannot assume that everyone will play by the rules—they must remind the team regularly. This is especially important in an organization with high turnover. Instead of taking values for granted, good leaders must instill them in their people.

Personnel

Leaders should evaluate people for increased responsibility based on their ability rather than their personality. This is a rather unnatural act because we generally like to work with people like us—it's more comfortable that way. But leaders have to widen their scope to include other voices and ideas. The fact that people are different doesn't mean they're not as good. Instead of conducting a personality contest, good leaders should grade their folks according to their ability and potential. When folks don't make the cut, the leader may have to make the tough call to move them on. This is one of the hardest things we have to do as leaders. It is an emotional event that disrupts lives and hurts feelings. But leaders must have the courage to make those tough decisions. Spending time hiring people is also important. Doing that right means that much of the rest will work out. Leaders who hire the wrong people work doubly hard to fix their prob-

lems. Instead of keeping deadweight, they should pull the plug if they have to.

Setting High Standards

Leaders encourage success in their organizations by setting high standards. Doing so squeezes productivity out of people who never knew they had it. We naturally want to do well. In many cases, if we set the bar high enough, the team will not only reach it but also surpass it. The military is a violent business that demands excellence. Because we cannot tolerate a big margin of error, we require dedicated professionals who understand that anything less will cost people their lives. Therefore, leaders must ensure that they have quality people. However, they should not expect all team members to achieve their personal standards—everyone can't be number one. But leaders should still set high standards and not apologize for them. Leaders who are satisfied with satisfactory will find that the same is true of their teams.

Equipping

People need tools and resources to succeed. The first question a leader should ask when things are not going well is whether or not the team has the proper supplies and training to accomplish the task. Failure is not always a problem—the team simply might not have the skills or resources it needs to succeed. Sometimes this means fighting for dollars or extra training time, but leaders do whatever it takes to set the table for success. They also encourage self-improvement and give adequate time for their people to do so. The better they are individually, the better the team will be collectively.

Accountability

Leaders must fix and demand accountability—this is part of the business. It's hard for new leaders, but they have to do it. If a team member has been told to do something, the leader must follow up to see that it's been done. Otherwise, the team won't take the leader seriously. The follow-through is most important. When followers aren't getting it right, they have to be told—and that's not always easy to do for first-time leaders. They can't let their people stay outside the lines too long because it's not good either for them or the organization. Accountability involves more than controlling bad behavior. Leaders also have to tell their people when they've got it right. This is an easy thing to do, but we probably don't do it nearly enough. One of the greatest motivators is patting people on the back and congratulating them on a job well done. Thanking people will encourage them to do even better. Leaders should be sure to do this in public because it will also motivate their coworkers.

Handling Adversity

All leaders go through adversity—that's guaranteed. They're going to screw things up. They're also going to lie to their people (unknowingly). When that happens, good leaders pull them aside and set the record straight. They admit being wrong and apologize. It's not a sign of weakness to do that.

❖ ❖ ❖

The capacity to lead is not a genetic trait or accidental ability. People are not born to be good leaders. On the contrary, good leadership is the result of calculated study, deliberate practice, and—sometimes—painful experience. Admittedly, everyone can't be a good leader. Some individuals will always be followers due to their personality or natural disposition. Yet, some people who have the innate potential to lead never do. Many never get the chance; others never take the risk. But for those willing to lay it on the line, leadership offers the opportunity to achieve great things. It's both personally and professionally rewarding.

Leadership is critically important—institutions rise and fall on the quality of their leaders. As I've laid it out here, it is a complex endeavor. But it doesn't take a rocket scientist—it takes someone smarter! The strategy and tactics of leadership require intense effort. But when leaders figure it out, there's not a more satisfying job. It's incredibly fun. If it weren't, I wouldn't have done it six times! □

LT COL PAUL D. BERG, EDITOR

Our Board of Reviewers—Unsung Heroes

AIRCRAFT CREW CHIEFS and others who work behind the scenes do not always get the recognition they deserve. The *ASPJ* Board of Reviewers is a case in point. Here's why. As a refereed publication, the *Journal* relies on subject-matter experts for peer reviews of the articles it publishes. Authors from around the world send us material for consideration. To help ensure that *ASPJ* publishes only the very best submissions, we send prospective articles to members of our Board of Reviewers—volunteers all—who scrutinize them, recommend whether or not they merit publication, and provide detailed feedback to the authors. Crew chiefs get to paint their names on their planes, but our reviewers work almost anonymously. During the refereeing process, we reveal neither the authors' names to the reviewers nor vice versa. We do print the names of about 40 reviewers on a page following the table of contents, but space prevents us from including all of them. If you notice changes in the list from issue to issue, we're just giving some of our unsung heroes their time in the sun. We on the *ASPJ* editorial staff extend a heartfelt thank-you to all members of the Board of Reviewers—we could not publish the *Journal* without you.

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Recent Air and Space Power Operations

AIR AND SPACE power operations have taken many forms recently, some of them attracting more attention than others. Brief episodes of high-intensity combat such as Operation Anaconda in Afghanistan and the first few weeks of Operation Iraqi Freedom loom prominently in Airmen's minds, but routine activities such as air mobility and intelligence, surveillance, and reconnaissance occur every day in relative obscurity. Few observers dispute that American airpower and space power, in concert with that of our allies, perform brilliantly when called upon to inflict what one might call "mass-production destruction" by rapidly gaining air superiority and striking numerous ground targets. However, applying airpower to the mundane tasks of restoring stability and security in troubled regions has proven more challenging. With ground forces playing highly prominent roles in countering insurgents in Afghanistan and Iraq, some observers may even question the relevance of airpower and space power to the long-term security challenges we now face. The US Air Force does not want to confine itself to a glass case labeled "break in case of major combat."

Airpower and space power bring great advantages to practically any military operation, but Airmen need to keep thinking about how to perform under conditions other than major combat. New equipment such as the F-22, C-17, and advanced satellites can serve many purposes, but one hears most often about how they contribute to major theater wars. Few likely opponents present serious air-superiority challenges, but insurgents and terrorists are widespread. How can Airmen best apply old and new equipment to the war on terror? Advanced weaponry will certainly play a role, but we should also consider innovative ways to use simpler gear.

Looking beyond major combat, we see that Airmen offer unmatched capabilities in the realms of expeditionary and effects-based operations (EBO). Projecting power rapidly over global distances and then sustaining it are essential aspects of expeditionary airpower. Although expeditionary operations have established themselves as an Air Force success story, more work remains. American Airmen need to continue honing their skills at establishing and protecting operating bases in austere locations, not only to project destructive combat power, but also to help restore order in troubled countries. However, they need not bear the entire burden themselves. Restoring order might entail rebuilding the air forces of former opponents such as Iraq so that those forces can help secure their own countries without threatening their neighbors. The Air Force has no obligation to provide such air arms sophisticated equipment and doctrine equal to its own but should nevertheless consider using expeditionary methods to assist them in times of need.

EBO, which has recently gained wide acceptance in the Air Force, can guide Airmen as they ponder the most appropriate application of airpower and space power. Fundamentally a commonsense approach, effects-based thinking links actions to the attainment of desired objectives. Careful analysis of the effects that actions might produce and the way those effects might lead to desired objectives remains key to deciding which actions to take. So far, Airmen have applied EBO most successfully to combat operations, but the concept has broader utility. The next step calls for extending EBO to noncombat activities and helping friendly air forces help themselves.

Recent experience offers plenty of fodder for those of us who contemplate how best to apply airpower and space power in pursuit of national goals, whether during open combat or while facing the amorphous environment in which we find ourselves the rest of the time. □

Airpower alone does not guarantee America's security. But I believe it best exploits the nation's greatest asset—our technical skill.

—Gen Hoyt S. Vandenberg

Making Airpower Effective against Guerrillas

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WE ARE VERY good at conventional warfare. Too bad that isn't enough any more. In Iraq and Afghanistan, the US military quickly defeated enemy conventional military forces and brought down hostile regimes. Afterward, however, counterguerrilla operations did not fare so well. In both countries, these operations have cost us more money and casualties than major combat did—and they have been less effective. Whether we call it low intensity conflict, small wars, counterinsurgency, counterguerrilla warfare, police operations, stability-and-support operations, or something else, the fact remains that our performance is dramatically less impressive after major combat.

Unfortunately, terrorism has become the greatest threat to our national security, and major combat operations alone will not win the global war against it. In many critical areas—such as Colombia, Yemen, or the Philippines—the war against terrorism may never reach the level of major combat operations. Even in Iraq and Afghanistan, our enemies have seized upon our relative ineffectiveness in counterguerrilla operations and now rely on guerrilla warfare as their primary means of continuing the conflict. We can expect our other foes to follow suit, avoiding major combat.

One reason the US military is so good at conventional war is that it knows how to achieve decisive effects with airpower and space power. But we have not mastered the use of these tools against terrorists and guerrillas. In fact, a number of our military people have trouble seeing how airpower and space power can contribute to operations short of major combat. For example, soon after the Army's 3rd Infantry Division captured Baghdad, the division released its Air Force air support operations squadron to

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redeploy, believing that the air-liaison element had nothing to offer at that point. Worse yet, the Airmen left because *they* were not sure how airpower and space power could contribute.[1] Some Airmen, *even now*, believe that airpower and space power are irrelevant in the fight against the most serious military threat our nation faces. Before we disband the US Air Force and find better uses for its resources, this article will suggest ways to make airpower and space power effective against our new enemy.

The New Enemy

Guerrilla warfare and terrorism are extremely old forms of conflict, but the precise threat they pose to the United States has changed over time. The communist insurgents we faced during the Cold War employed guerrilla warfare, advocated a communist and nationalist ideology, and generally enjoyed Soviet support. Following the doctrines of Vladimir Lenin and Mao Tse-tung, these leftist guerrillas tended to be well organized and highly disciplined. The local communist party formed an ideologically fanatical elite that led the insurgency, intended to lead the future government, and focused every act of violence on a clear political aim, while trying to demonstrate that it would not steal from the common people. Soviet support often gave these leftist insurgents access to enough funding to ensure financial solvency without "taxing" (read "stealing from") the peasants. The Soviets also provided them the latest technology. For example, in 1981 the Polisario rebels in Western Sahara received state-of-the-art military hardware, such as SA-6 air-defense missile systems, even though they were a very minor insurgent group.[2]

Instead of well-disciplined Cold War revolutionaries with easy access to money and the latest technology, the United States now faces loose coalitions of criminals, insurgents, and terrorists found not just in Iraq and Afghanistan, but in Colombia, the Philippines, and elsewhere. They apparently make up the post–Cold War model for guerrilla warfare.[3] Each sort of opponent has different objectives. Criminals are motivated by money, targeting whoever is in power to create a chaotic and lawless space where they can prosper. Insurgents attack the current government in an effort to replace it with a different one. Both groups might use terrorist tactics, like those of Pablo Escobar in Colombia and the Vietcong in Saigon, but the suicidal terrorists we now face have no intention of getting rich or taking power themselves.[4] Their immediate goal is simply to tear down current power structures, including the influence of the United States. The exact mix of these different groups varies over time and between regions, making our enemy amorphous, evolving, and very difficult to destroy. For example, when we defeat insurgents, they may simply turn to crime (as did Confederate guerrilla Jesse James after the Civil War).

These new enemies generally lack the discipline and access to high-technology weapons typical of Cold War insurgents, but their undisciplined

nature and the ever-evolving mix of different elements make them enormously complex. Worse yet, the old Cold War restraints have fallen away. The United States and Soviet Union not only refrained from direct attacks on each other's homeland, but also imposed that rule on the guerrillas they supported. Because the new terrorists observe no such restraints, our objectives have had to change as well. During the Cold War, we were satisfied with simply preventing an insurgent victory over a friendly government. But after the events of 11 September 2001, we must prevent the insurgents both from taking over an entire country and from establishing long-term local control of remote areas because these could become bases for launching international terrorist operations. Traditional counterinsurgency and "hearts-and-minds" campaigns are still necessary, but terrorists and criminals do not need popular support, so pure counterinsurgency is no longer good enough. We must not merely thwart the insurgents; we must defeat the guerrilla tactics of our criminal and terrorist foes. Why is that so hard?

Why Guerrillas Pose Such a Difficult Problem

One astute scholar describes US Air Force counterguerrilla doctrine as "a short journey to confusion."[5] Others characterize the current lack of attention to counterguerrilla operations throughout our military as "scandalous."[6] But so what? At first glance, guerrillas do not appear to be formidable opponents; in fact they seem exactly the sort of "threat" we can defeat without special doctrine or training. After all, the guerrillas we now face are small forces with only light weapons and fairly primitive command, control, and information systems.[7] Without Soviet sponsorship, their financial resources are tiny compared to ours, and their technology is a generation or more out of date.

The problem is that the guerrillas have a concept of operations (CONOPS) for which we are not prepared. They, like organized criminals, work the seam between military and law-enforcement organizations. The guerrillas are too numerous, aggressive, and heavily armed for police agencies to deal with (particularly the disorganized and lightly armed ones, such as the newly reestablished Iraqi and Afghan police). However, they are too small and hard to identify for military forces to handle (particularly foreign military forces). These guerrillas and organized criminals will attack and kill, drive off, or take over the local police and intimidate the civilians. When our military forces arrive to restore order, they face endless harassment from insurgents, terrorists, and criminals who seem to blend seamlessly into the civilian population. US military forces lack the investigative skills to track down criminals and have very few sources of information within the alien and intimidated civilian population to help them sort friend from foe.[8]

Airpower and space power are inherently flexible, but we have purchased equipment and trained our Air Force with major combat in mind. Assumptions that drove our training and equipment design do not

necessarily apply to the guerrillas' CONOPS, and the habits we have ingrained in our officers do not always prove effective. For example, Air Force officers have been taught to think in terms of observe, orient, decide, act (OODA) loops and sensor-to-shooter time. But the OODA loop applies specifically to air-to-air combat, and sensor-to-shooter becomes an issue only for large bureaucracies that have decided to develop separate intelligence (sensor) and operational (shooter) communities. In a guerrilla ambush, the sensor and the shooter are the same, so there is no time lag. In terms of the OODA loop, guerrillas have no trouble observing soldiers, Airmen, and policemen because of their uniforms, but we have plenty of trouble observing them because they look like civilians. If the on-site guerrilla leader conducting the ambush does not like what he sees, he waits for another day. If he likes what he sees, he opens fire—as do the other guerrillas—and flees after a few seconds. Either way, the sort of move-countermove interaction assumed by the OODA loop never takes place. It is worth noting that, in pursuing the Mafia, the FBI does not talk about the OODA loop because it is not a particularly helpful concept for dismantling that organization. Neither will the OODA loop play a key role in defeating guerrillas.

When confronted with an enemy, many of our officers reflexively ask, What is the enemy's command and control (C2) system? What sorts of signatures do his communications leave? How can we target those communications? All of these questions assume that the enemy has and needs centralized C2 of his activities and that he needs a vulnerable communication system to exercise that centralized control. But such may not be the case. The Vietcong had a very hierarchical structure but operated with extremely slow communications, such as notes carried by messengers and face-to-face meetings. The central-command elements laid out a general policy, but the details of when and where to conduct guerrilla attacks resided with low-level local leaders. Thus, our interdiction of their communications often had little or no impact on the frequency or effectiveness of guerrilla attacks. Criminal organizations operate with even less structured communications than those of insurgents, and terrorist leaders can monitor subordinates' activities by reading the newspaper as well as provide guidance through public press releases sent to sympathetic news organizations.

At a more basic level, our approach attempts to achieve rapid, decisive strategic effects on the enemy—and we assume that the enemy tries to do the same thing to us. Unfortunately, guerrillas follow a strategy of "protracted war." Like criminals, they assume they cannot achieve rapid, decisive effects and do not attempt to do so. Instead, insurgent, terrorist, and criminal organizations consciously design themselves so that our military and police forces *cannot* rapidly and decisively defeat them. They intend not to destroy, but merely hurt us—all the while staying out of reach. A "major combat" mind-set that seeks immediate, decisive results will simply lead to frustration because the enemy tailors his every action to make it impossible for us to achieve rapid, strategic success against him. Worse yet, this mind-set will lead

us to organize and plan in ways that pursue an impossible goal, rather than in ways that will achieve the sort of slow, incremental success that *is* possible.

For example, air doctrine holds that airpower—ideally, all military operations—should be centrally planned but decentrally executed. This approach helps achieve rapid, decisive strategic success but may prove dysfunctional against a dispersed, distributed enemy who deliberately organizes and operates to keep his losses at an acceptable level. Typical law-enforcement operations, on the other hand, are locally planned and executed. The more our foes operate like criminals, the closer counterguerrilla operations must come to the law-enforcement model, with less centralized planning and operations. With some difficulty, US ground forces can plan and conduct counterguerrilla operations at a very low tactical level (battalion or company). The Air Force, however, has traditionally integrated with ground planning and operations at a much higher level (corps or division), and this often takes air out of the fight.

Increasing the Effectiveness of Airpower

Obviously, our new foes have successfully adapted to our dominance in air and space power. It is now our turn to demonstrate the inherent flexibility of that power by rededicating ourselves to meeting this new challenge. Fortunately, there are many ways we can enhance the effectiveness of airpower against our new foes.

Decentralizing Airpower Planning

Currently, we assign air-liaison elements to relatively high ground-command levels, based on the size of the ground unit rather than the need for air support. Because of the decentralized nature of counterguerrilla operations, we need to push air-liaison elements (real air planners, not just enlisted tactical air controllers) down to lower ground headquarters. The current shortage of such planners will force us to train more of them and carefully determine where to focus them. Pushing planners down to lower levels in one region will leave larger units somewhere else with fewer such personnel—a situation that entails risk. Sometimes we will focus the planning effort in the wrong place, but the current system assigns air liaison to the wrong command level without regard to either the mission or the threat, thereby wasting a precious resource.

Identifying Guerrillas among Civilians

By posing as peaceful civilians, our foes make themselves very hard to identify. Although the entire US intelligence establishment is trying to improve its gathering of human intelligence, this data—even in combination with that obtained by other intelligence sources and persistent intelligence, surveillance, and reconnaissance (ISR)—will not solve the problem if our

personnel are not trained to exploit it. If we are to track down guerrillas, the US military's intelligence training and collection must concentrate more on understanding criminal, terrorist, and insurgent networks, even if this means putting less emphasis on the traditional strengths of our military intelligence, such as determining the conventional ground order of battle and targeting power grids and transportation networks. Even in these areas, we need to alter our approach. For example, we should train analysts not only in how airpower might best attack enemy power grids, but also in how guerrillas might threaten friendly grids. Our study of enemy transportation systems also needs to expand beyond the interdiction of conventional military traffic to include an assessment of how transportation patterns indicate the routes used by criminals, terrorists, and insurgents so that we can interdict these "rat lines." Fortunately, US intelligence agencies and civilian law-enforcement organizations already have some of this expertise and can provide training until military schools catch up.[9]

During operations, guerrillas sometimes hide in a large crowd of civilians to protect themselves from our firepower. Currently, airpower can arrive rapidly but cannot identify these terrorists; large ground elements, on the other hand, can sort these people but may not arrive until the crowd has dispersed and the terrorists have escaped. We need to develop nonlethal weapons that will either hold the crowd in place or identify its members so that ground elements can sort them out when they arrive. For example, the high-powered microwaves we are testing for driving personnel away from air bases could be mounted on aircraft and used to herd people together, keeping them in an area until ground forces arrive. Another option would allow us to use aerial-delivered ink or dyes to mark all of the people in a crowd, enabling ground forces to round up and question the ones caught "red-handed." Furthermore, we could even use inks visible only under ultraviolet or infrared light to mark people without their knowledge—for example, by spraying the ground in places where terrorists often explode improvised devices and then following footprints back to their hiding place.

Devising Highly Tailored, Air-Delivered Effects

In our efforts to produce ever-more-precise results against enemy power grids, we developed such things as carbon-filament munitions that short-out the grids without doing long-term damage, unlike conventional bombs. We need to apply that same sort of imagination to the current challenge involving guerrillas in order to achieve precisely tailored effects, rather than try to employ weapons designed for major combat.

The need to destroy hard targets and survive in a high-threat environment led the Air Force to develop large bombs and dispensers for cluster bomb units that deliver enormous effects from a small number of passes. But these conditions do not apply to the guerrilla threat. Enemy air defenses are generally negligible, so there is no need to limit the number of passes, which can provide a deterrent effect. By operating in small, widely dispersed

elements, guerrillas have made themselves difficult for our small number of large weapons to kill. Moreover, their presence in civilian areas discourages use of these weapons due to the risk of severe collateral damage and counterproductive effects. For example, the Taliban are known to move about on small motorbikes, usually two men per bike. Even if it can find and hit such small vehicles, an F-16 with two 2,000-pound bombs can expect to destroy exactly two of these bikes; it also risks inflicting serious collateral damage if the attacks occur in civilian areas. The aircraft would be vastly more effective against these sorts of targets if it delivered a large number of much smaller, individually targetable weapons. Clearly, we need to continue to accelerate our research into smaller, smarter weapons.

However, until we have a five-pound Joint Direct Attack Munition and a mini-Maverick, we will have to use existing weapons to defeat guerrillas. One quick fix calls for making better use of our guns. Although some individuals consider strafing an act of desperation, it might offer the ideal way to destroy Taliban motorbike teams. Improving fire-control software so that it gives good fire solutions for strafing at safe altitudes could provide part of the answer; additionally, replacing bombs with gun pods would increase the effectiveness of strafing. Given rates of fire between 50 and 100 rounds per second, expected dispersal at realistic engagement ranges, and the killing power of high-explosive rounds, a burst of less than one second should put down a cone of fire that would easily and cheaply kill two Taliban motorcyclists—and do so with only a fraction of the potential for collateral damage caused by our smallest current bomb. Another option worth considering involves modified Hellfire missiles, about one-sixth the weight of a Maverick and with a warhead about one-tenth the size of the larger missile's. Thus, our aircraft can carry many more Hellfires than Mavericks and produce much less collateral damage.[10] Inert practice bombs—used against Iraq during Operation Northern Watch—may also be worth another look.[11]

Our need to achieve very precise effects against guerrillas does not stop with smaller missiles, smaller bombs, and the use of guns in place of bombs. We must also develop air-delivered, nonlethal weapons that facilitate the capture of suspects. Currently, commanders know that they can kill people with airpower but cannot capture them or determine whether they are in fact someone the United States wants to kill. Many of our rules of engagement wrestle with exactly this question of when to shoot and kill and when not to shoot (and therefore allow to escape); indeed, some of the toughest decisions confronting our commanders arise from the fact that airpower can kill but cannot capture. If we could detain individuals from the air until ground elements take custody of them, as mentioned above, many of these difficulties would subside. Our engineers have conducted a good deal of work on devices that electronically incapacitate vehicles and on sticky slimes and foams that have the effect of radically slowing down any sort of movement. Disorienting weapons—for

example, the “flash-bangs” that temporarily stun people with a blinding flash and deafening bang—are already in use. By developing the ability to air-deliver these sorts of weapons, the Air Force could escape the classic airpower bind of being able to kill people but not capture them.

Responding Immediately to Attacks

The United States has excellent space-based systems that spot the characteristic signatures of ballistic-missile launches. In the counterguerrilla fight, the threat is not ballistic missiles but rockets, mortars, rocket-propelled grenades (RPG), and man-portable air defense systems (MANPADS). We need to bring our space-based concept down to the counterguerrilla level by deploying persistent aerial ISR platforms that provide similar wide-area coverage focused on the specific signatures of these weapons. The air platforms could take the form of tethered blimps, unmanned aerial vehicles, or manned aircraft.[12] Whatever the system, it would have to provide the location of the enemy weapon that fired. Thus, we need to organize our ground and air assets so that the grid of the firing location would immediately cue other ISR sensors to get images of the site and signal strike assets and/or friendly artillery and mortars to return fire. Ground and air assets would also receive instructions to quickly seal off the area from which the fire came in order to catch the enemy, even if he flees before we can engage.

This sort of real-time, precision return fire features some effects-based advantages over other methods of catching guerrillas. Like the criminal who goes to jail with no intention of giving up crime and every intention of not getting caught again, the guerrilla turned in by locals or caught due to his own incompetence often does not regret his attacks on US forces but does regret his capture. This scenario has the effect of making would-be guerrillas hide better and become more ruthless in finding and punishing those who speak out against them, but it may not deter future attacks. On the other hand, destroying the enemy while he is either conducting an attack or attempting to flee afterward is much more likely to have the desired effect of making guerrilla attacks seem dangerous and unproductive to would-be attackers.

Protecting Infrastructure and Controlling “Empty” Areas

Large parts of Afghanistan, Iraq, Colombia, the Philippines, and other countries are uninhabited.[13] Airpower can (and probably should) take the lead in controlling many of these areas, releasing ground forces to focus on urban areas where airpower may prove more effective in a supporting role. These uninhabited locales contain pipelines, power lines, national borders, vital roads, rivers, and sea routes that need monitoring to prevent terrorists from entering the country, damaging infrastructure, mining roads, and moving freely along rivers, roads, and sea routes. Remote ground and water sensors, combined with small surface patrols and

airpower, offer a means of controlling these areas with minimal manpower. In some places, the first reaction force might consist of heliborne infantry that can apprehend/detain suspects. In other instances—particularly when the small infantry/police element meets resistance—aircraft can destroy the enemy. The Air Force already conducts pipeline-security missions in Iraq, but it must develop and codify doctrine; CONOPS; and tactics, techniques, and procedures for these sorts of operations, which attempt to secure and control sparsely populated areas. This new doctrine must also include aircentric counterguerrilla operations in these areas, with the air component as the supported commander.

In Africa and South America, contract security firms have effectively patrolled pipelines with refurbished former Air Force O-2 aircraft equipped with commercially available forward-looking infrared. These inexpensive platforms may be nearly as effective as the much costlier Air Force combat aircraft used in this role. Contractors or allies could make a significant contribution in this niche because they can afford to provide large numbers of low-cost platforms such as O-2s, T-6s, AT-37s, or comparable foreign platforms, which they could turn into very effective counterguerrilla platforms.

Building Counterguerrilla Air Forces

Ultimately, we must turn over the mission of patrolling and protecting borders and infrastructure to local (in Afghanistan and Iraq, newly re-created) air forces. Even though these air forces can't bear the cost of a useful number of high-performance aircraft such as AH-64s or F-15Es, they can afford a much larger number of less expensive platforms. The latter could be just as effective as more expensive platforms in counterguerrilla operations but ineffective in aggression against neighboring countries. They would therefore enhance internal stability without destabilizing the regional balance of power, making them more effective for achieving our goals than more capable aircraft would be. Consequently, we must expand our foreign internal-defense squadron (the 6th Special Operations Squadron) and prepare it to create these new—counterguerrilla—air forces. We need to provide not only pilot and mechanic training, but also a comprehensive program that can forge an entire air force, including the training infrastructure that the new organization will need to sustain itself and build upon.

This is a tall order, but the United States and its coalition allies have already committed themselves to establishing new armies in Iraq and Afghanistan. Because these nations need new air forces as well, we must develop the capability to help create them, particularly those designed to perform counterguerrilla, border-patrol, pipeline-security, and counterdrug operations. When we are able to form entire counterguerrilla air forces, we can assist friendly nations in developing the counterguerrilla capabilities of their existing air forces. For example, the Pakistani air force could use a

more robust counterguerrilla capability, but dramatically enhancing its conventional aspects could destabilize the entire region. The United States, therefore, must learn to lend this type of support without establishing the means of conducting deep, offensive air strikes.[14]

Preparing Intratheater Airlift Warriors

Even with our best efforts to secure surface lines of communication, guerrillas will increase the expense and risk of surface transportation. Allied commanders will respond to this situation by increasing their demands for intratheater airlift. Thus, in counterguerrilla warfare, airlifters will find themselves on the front lines, taking enemy fire and suffering casualties. They need to understand that they are indeed warriors and must plan and operate accordingly. When the threat so dictates, they will vary their times and routes, "packaging" their missions with strike aircraft—including attack helicopters—during the most dangerous portions of their flights. Airlift operations may also help lure guerrillas into places where we can capture or kill them. Specifically, the long, static nature of roads makes them difficult to secure; furthermore, mines enable the enemy to attack vehicles long after he has left the area. Airlift, however, is largely immune to mines and much harder to ambush because aircraft can follow a vast array of different routes between two points. Thus, airlift forces guerrillas to focus their efforts on bases where aircraft take off and land. The characteristics of RPGs and MANPADS, on which guerrillas rely, combine with our takeoff and landing patterns to create both obvious areas from which the enemy can attack our aircraft and very specific times when these transports are vulnerable, making the enemy more predictable. Protecting the aircraft during such well-defined times is much simpler than securing many thousands of miles of roadway over an entire country around the clock. Most importantly, by focusing our ISR and strike assets on the MANPADS launch areas at the appropriate times, by conducting cordon-and-search operations on the ground, and so forth, we can take the offensive against the guerrillas. To do so, which requires achieving real synergy in ISR, airlift, and attack missions, the United States must fully integrate fixed-wing and rotary-wing aviation across service lines. Although current doctrine places such synergy at the level of the combined force air component commander and Army Corps, in the counterguerrilla fight, we need to establish true joint air interdependence at a much lower level of command. That requires us to think and organize differently.

Conclusion

Airpower remains the single greatest asymmetrical advantage the United States has over its foes. However, by focusing on the demands of major combat and ignoring counterguerrilla warfare, we Airmen have marginalized

ourselves in the global war on terrorism. To make airpower truly effective against guerrillas in that war, we cannot wait for the joint force commander or the ground component commander to tell us what to do. Rather, we must aggressively develop and employ airpower's counterguerrilla capabilities. This article has attempted to address how we might go about doing just that. □

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Notes

1. Lt Col Bill North, director of operations, 15th Air Support Operations Squadron, interview by the author, Fort Stewart, GA, 15 October 2003.

2. For information about the strategic paralysis that the SA-6 imposed on the Polisario's enemy—the Royal Moroccan Air Force—see Lt Col David J. Dean, *The Air Force Role in Low-Intensity Conflict* (Maxwell AFB, AL: Air University Press, 1986), 41–51 and 67–70.

3. Of course, violent insurgency is generally considered "criminal" behavior, but the methods of contemporary opponents—drug trafficking, bank robbery, kidnapping, and so forth—are clearly more criminal than "revolutionary."

4. Both the Colombian drug cartels and the Vietcong made liberal use of car bombs to kill specific enemies and to sow chaos and fear. They generally did not use suicide-bombing tactics in the way many Middle Eastern groups have during the last few decades.

5. Dennis M. Drew, "U.S. Airpower Theory and the Insurgent Challenge: A Short Journey to Confusion," *Journal of Military History* 62, no. 4 (October 1998): 809–32.

6. James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003), 4.

7. Some unclassified accounts estimate that, in Iraq, more than 100,000 US and coalition troops are opposed by only 5,000 or so full-time guerrillas. See Jim Krane, "Iraqi Attacks Show Central Planning," *Philadelphia Inquirer*, 18 December 2003.

8. For an example of US military-intelligence personnel learning to become detectives, see Farnaz Fassihi, "Two Novice Gumshoes Charted the Capture of Saddam Hussein," *Wall Street Journal*, 18 December 2003, 1. For the use of civilian law-enforcement software in the fight against Iraqi insurgents, see Bruce Berkowitz, "Learning to Break the Rules," *New York Times*, 19 December 2003.

9. For an example of US military-intelligence personnel teaching themselves police investigative techniques, see Jim Krane, "Software Lets U.S. Forces Predict Sites, Timing of Attacks," *San Diego Union-Tribune*, 21 December 2003.

10. Even though the Israelis have numerous Mavericks, they prefer to use Hellfire missiles in their targeted killing of terrorists in populated areas because the latter produce less collateral damage. The Hellfire gives up considerable range to keep its weight down, but in a low-threat environment, one does not need as much standoff range. Weight and warhead comparisons come from David F. Crosby, *A Guide to Airborne Weapons* (Mount Pleasant, SC: Nautical and Aviation Publishing Company of America, 2003), 11–13 and 22–24.

11. During Operation Northern Watch, inert bombs proved less successful in limiting collateral damage than anticipated because they sometimes ricocheted and skipped far from their intended target. The answer would seem to be some sort of nonexplosive, disintegrating kinetic device that would hit the target like a 50-pound sandbag at terminal velocity, killing an individual or demolishing the cab of a truck, but leaving only a cloud of dust as collateral damage.

12. In October 2003, the Department of Defense requested $38.3 million to purchase tethered blimps for use in counterguerrilla operations. See "New Spy Gear Aims to Thwart Attacks in Iraq," *New York Times*, 23 October 2003, 1.

13. In the Philippines, water makes up many of these uninhabited areas; however, the terrorists, criminals, and insurgents use faster boats than the Philippine government, so airpower will be of key importance in controlling these areas.

14. Building a counterguerrilla air force instead of a conventional one would be like building a coast guard instead of a navy.

Defining Decentralized Execution in Order to Recognize Centralized Execution

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BECAUSE THE DEFINITION of decentralized execution is imprecise, Airmen cannot coherently define the concept or recognize centralized execution. They may be able to tell you what decentralized execution tries to achieve, but can they tell you what it is? Or isn't? Do we in some cases practice centralized execution and call it something else? Do the orders we issue and receive influence or confuse the issue of our operating mode?

If these questions offend you or if you violently disagree, stop right now and ask five Airmen in your immediate vicinity to briefly define the Air Force tenet of centralized control and decentralized execution. If you get less than consistent, logical, and succinct answers, resume reading. Now let's review the first and foundational concept—centralized control.

Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines centralized control as follows: "In joint air operations, placing within one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations."[1] Note that this definition is limited to joint air operations and accurately reflects the fact that airpower is best employed by one commander. Centralized control for theater air and space operations occurs when one joint force air and space component commander (JFACC) has responsibility for joint air and space operations. Likewise, the commander of Air Mobility Command exercises centralized control of intertheater airlift operations, and the commander of Fourteenth Air Force does the same for Air Force space operations.

Note that one individual retains the planning, directing, and coordinating of joint air operations. This critical point pertains only to joint air operations; that is, this individual does not share the authority to plan, direct, and coordinate these operations with peer or subordinate commanders. The latter can plan, direct, and coordinate their units' internal operations that support joint air operations, but the conduct of these air operations is reserved for one commander. This fact reflects today's operating practices, which call for one plan embodied in the air tasking order and one commander—the JFACC—who plans, directs, and coordinates joint air operations. Airmen understand that a single plan conceived at the

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operational level of war, even a highly detailed and comprehensive one, cannot possibly cope with the demands of modern combat. Therefore, in order for subordinates to perform at their maximum capability, centralized control has to be offset by decentralized execution.

JP 1-02 defines decentralized execution as "delegation of execution authority to subordinate commanders."[2] In contrast to the definition of centralized control, this one applies to all joint force components. However, the definition omits just what *execution authority* means! Does it mean the authority to shoot prisoners? Of course not! Does it mean the authority to initiate action? Perhaps. Since the definition does not clarify the central term *execution authority*, the effort to pin down a more exact definition of decentralized and centralized execution fails. To understand what the terms in question mean, we need to break down and examine the phrase *delegation of execution authority*.

First, a commander *delegates* or assigns to a subordinate commander part of his or her authority, commensurate with the assigned task.[3] Next, according to commonly accepted senses of the terms, *execution* is the act or instance of carrying out or performing something, and *authority* is the power to compel obedience or, in practical application, to issue orders. Thus, in plain language, delegation of execution authority means that superior commanders authorize subordinate commanders to issue orders to accomplish an assigned task.

By accepting this definition, we are technically correct in concluding that joint air operations are centrally executed since the concept of centralized control excludes subordinate commanders from the direction of these operations. However, for theater operations, the JFACC empowers the theater air control system's (TACS) subordinate echelons rather than commanders of subordinate units to issue orders for the direction of combat operations. To accommodate the concept of centralized control and for purposes of clarity, I propose the following revision to the definition of decentralized execution: "delegation of authority to issue orders to subordinate commanders or subordinate elements of a command and control system to accomplish their assigned tasks."

Decentralized execution occurs if a sortie launches and is then controlled by a subordinate element of the TACS. Close air support missions provide a clear example of decentralized execution. Centralized execution happens if a sortie carries out its mission under direct control of an air and space operations center (AOC) (whether a theater AOC, the tanker airlift control center, or the space AOC), with no other echelon in the chain of command issuing orders. Hence, most strategic attack and some interdiction missions are centrally executed. To define some aerial operations as centrally executed is not to state that they are somehow wrong; it is simply truth in advertising.

Because of the assumption that restrictions on tactical flexibility and situational responsiveness mean that centralized execution is taking place,

Airmen sometimes confuse restrictive orders with centralized execution. Receipt of orders granting the authority to issue orders to accomplish the assigned task may or may not confer the ability to show initiative or exercise tactical flexibility. Rather, the nature of the orders themselves determines the latitude allowed in how they are carried out. Some orders are almost commands, permitting little freedom to deviate from instructions; others are mission-type or effects-based, allowing great discretion in task accomplishment.

Decentralized execution does not mean delegation of authority to issue orders to wage war as a subordinate sees fit. It means that the authority to issue orders to accomplish the task assigned is delegated, and sometimes these tasks are more limited than the norm. For example, in some recent operations a joint force commander or JFACC issued restrictive rules of engagement and tasked subordinates to find a target rather than find and destroy a target. Often this delegation of authority for limited tasks (resulting in restrictions on tactical decision making) happens when higher authorities wish to control strategic effects, even at the expense of tactical efficiency.

Decentralized execution is the preferred mode of operation for dynamic combat operations. Commanders who clearly communicate their guidance and intent through broad mission-based or effects-based orders rather than through narrowly defined tasks maximize that type of execution. Mission-based or effects-based guidance allows subordinates the initiative to exploit opportunities in rapidly changing, fluid situations.

The new definition of decentralized execution proposed here permits Airmen to distinguish between it and centralized execution and to acknowledge operating in a centralized execution mode. By adopting this definition and encouraging widespread understanding of how we actually operate, we can enable Airmen to discuss how best to perform in the future. □

Maxwell AFB, Alabama

Notes

1. Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (as amended through 23 March 2004), 81. Joint air operations are "air operations performed with air capabilities/forces made available by components in support of the joint force commander's operations or campaign objectives, or in support of other components of the joint force." JP 3-30, *Command and Control for Joint Air Operations*, 5 June 2003, GL-6.

2. JP 1-02, *Department of Defense Dictionary*, 143.

3. Delegation of authority is "the action by which a commander assigns part of his or her authority commensurate with the assigned task to a subordinate commander. While ultimate responsibility cannot be relinquished, delegation of authority carries with it the imposition of a measure of responsibility. The extent of the authority delegated must be clearly stated." JP 1-02, *Department of Defense Dictionary*, 149.

Editor's Note: PIREP *is aviation shorthand for* pilot report. *It's a means for one pilot to pass on current, potentially useful information to other pilots. In the same fashion, we intend to use this department to let readers know about air and space power items of interest.*

Gen Benjamin O. Davis Jr.

American Hero

COL ALAN GROPMAN, USAF, RETIRED*

GEN BENJAMIN O. DAVIS Jr. is an American hero—a champion who abundantly demonstrated both physical and moral courage. We reserve the term *heroes* for those people who display physical courage because they risk their lives for something bigger than themselves—the greater good of their nation or their people, for example. General Davis certainly met this standard, many times over.

Inspired by flight at age 14, young Davis convinced his frugal father to pay a barnstormer to fly him over Washington, DC. From that moment on, airplanes captured his imagination, and he would later use aviation to promote military and social reform of the first importance. After coming of age, he decided that by helping bring victory to the United States in World War II, he could give validity to racial integration, choosing the skies of Europe as his battlefield and the airplane as his weapon. By proving that blacks could fly, fight, and lead with the same courage, dedication, discipline, and skill as

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USAF photo

The first five graduates of Tuskegee Army Airfield, 7 March 1942. Left to right: *George "Spanky" Roberts, Benjamin O. Davis Jr., Charles H. DeBow, R. M. Long (instructor pilot), Mac Ross, and Lemuel R. Custis.*

whites—a notion utterly foreign to almost all whites in America in 1941—he would help destroy the myth of racial inferiority. This lie served as the foundation for segregation in the United States, and General Davis knew it had to be demolished to improve both the military and also the destiny of blacks in America.

To do so, he risked his life above foreign fields in distant skies against some of the most skilled and well-equipped flyers in the world—the fighter pilots of Nazi Germany's Luftwaffe. Just as importantly, he also had to stand up to, confront, and openly disagree with his military superiors when they tried to inhibit or destroy his Tuskegee Airmen. It is important to note that the Tuskegee Airmen—the pilots and their ground crewmen, who were trained to fly, fight, and maintain aircraft at Chanute and Tuskegee Army Airfields in the early and mid-1940s—shared General Davis's vision and courage. He succeeded not only because of his genius for command, but also because of all the other Tuskegee Airmen's dedication to the mission.

We honor General Davis for his physical courage—signified by the 60 combat missions he flew during World War II and the decorations he earned, which include the Distinguished Flying Cross and Silver Star—as well as his leadership of the Tuskegee Airmen. We also pay tribute to him for his open display of moral courage. Throughout his entire professional life, he held to the West Point creed of Duty, Honor, Country. General Davis devoted 43 of his 89 years to service to the United States, spending the entire time in aviation. He loved his country, and he loved to fly.

General Davis placed duty on an equal footing with West Point's other two virtues, clinging to it when he faced bigotry and discrimination, when he confronted a highly skilled enemy, and when he served his people and country, even though he could have chosen a much less arduous and infinitely less dangerous career. Sadly, the cadets at West Point from 1932 to 1936 shunned him completely because of his race—no one talked to Ben Davis except for official reasons during his four years there. He responded by adopting the credo of those who tried to drive him out—Duty, Honor, Country—and stood defiantly against their bigotry. The silencing followed him into the Army, continuing for several years after graduation. His lonely years at West Point symbolize his determination, discipline, resolve, and sense of duty—his moral courage. Knowing that the bigots wanted him to fail made him all the more determined to succeed, and he graduated in the top third of the class of 1936.

Honor? The cadets in attendance between 1932 and 1936 acted dishonorably, as did the leadership of the United States Military Academy. West Point violated its own code, but nobody there or in the Army intervened. General Davis knew he was fighting something bigger than the racism of young men in their teens and early twenties, but he remained undaunted, standing up to intolerance with dignity and never relenting. His honor is unquestioned.

After graduating from flying school at Tuskegee Army Airfield, Alabama, General Davis took the 99th Fighter Squadron—which included the first of the Tuskegee Airmen—to North Africa where they suffered discrimination at the hands of the commander of the 33d Fighter Group. That colonel tried to exile

the 99th from combat and prevent the establishment of the 332d Fighter Group and 477th Medium Bombardment Group—the other new units consisting of Tuskegee Airmen. General Davis fought for his men, taking on the commander and much of the leadership of the entire Army Air Forces—everyone who endorsed the group commander's bigotry. Davis, a lieutenant colonel at the time, openly and vocally disagreed with the commander of the Army Air Forces, a four-star general, who tried to destroy the reputation of the 99th and marginalize all blacks. General Davis won that battle in the Pentagon in a stunning display of moral courage.

In Italy in command of the 332d Fighter Group, he had the opportunity to change missions from ground attack to bomber escort. Successfully doing so would underwrite his goal of exploding the falsehood of racial inferiority by demonstrating the skill of the Tuskegee Airmen against the vaunted Luftwaffe. Their record under General Davis is unique. In 200 escort missions to heavily defended targets, the Tuskegee Airmen never lost a bomber to an enemy fighter. No other fighter unit flying half the missions could claim such success. This triumph stands as a tribute to the dedication, skill, courage, and discipline of these men and to the tactical acumen and leadership of General Davis.

During the war, the Tuskegee Airmen also downed 111 enemy aircraft in air-to-air combat; shot down the second, third, and fourth enemy jet fighters to make their appearance in combat; destroyed more than 150 Luftwaffe aircraft on German air bases; damaged many German locomotives and much rolling stock; and sank a German destroyer and numerous river barges. Their achievements convinced several Air Corps leaders that segregation was unnecessary, and, therefore, an unconscionable waste. When the Air Force became an independent service in 1947, its chief of personnel studied the disutility of racial segregation, finding no basis for it either biologically or sociologically, and cited both the record of the Tuskegee Airmen and the leadership of General Davis to document the case for integration. Thus, the United States Air Force became the first service to do away with the costly, disruptive practice of segregation by announcing its intention to integrate in April 1948; it began the process in May 1949 and finished it two years later. By taking this action, the Air Force became the service of choice for talented blacks by an overwhelming margin. Racial integration worked smoothly, improved Air Force operations, and set an example for the other services.

Faced with the demands of the Korean War, the Army, Navy, and Marine Corps followed suit. In fact, the US armed forces set the example for American society by completing integration decades before the first black managed a major league baseball team or coached in the National Basketball Association. We live in a different America from the one of the 1940s because the armed forces—the school for the nation in the 1940s and 1950s—taught America how to make integration work.

General Davis proved essential to this transformation. His stellar performance at West Point and his outstanding deeds during World War II, as well as those during the remainder of his career in the Air Force and Department of Transportation, exploded the fabrication of racial inferiority. Furthermore, his awards for heroism and the performance of the Tuskegee Airmen under his command swept away the folklore that blacks lacked courage and would not follow black leaders. Finally, his effective,

White House photo, Benjamin O. Davis Jr. Collection

Benjamin O. Davis Jr., assistant secretary of transportation, with President Gerald Ford, White House, August 1974

harmonious tenure as commander of the 332d Fighter Wing and base commander at Lockbourne Air Force Base, Ohio, between 1946 and 1949—during which time he led numerous civil servants, all of them white—destroyed the lie that whites would never work for a black supervisor. General Davis discredited all of these barriers to racial integration.

The general had a rich career after 1949 at the Air War College and the Pentagon; in Korea, Japan, the Republic of China, Germany, Korea, and the Philippines; and at United States Strike Command in Florida. After retiring from the Air Force in 1970 as a lieutenant general, he served as director of public safety in Cleveland and later in the Department of Transportation. His creation of the sky-marshal program drove the rate of skyjackings in the United States to zero in short order. General Davis received his fourth star in 1998, about three and a half years before his death. Clearly, he achieved much in his long life, but no accomplishment gave him more satisfaction than leading the effort to end segregation in the United States Air Force.

Indeed, nobody is more responsible for integrating American society than Ben Davis, who used the P-40, P-39, P-47, and P-51, as well as the skill and discipline of the Tuskegee Airmen, to do so. His proficiency in aviation demonstrated to all except the most bigoted individuals that race did not matter. As a final note, although General Davis certainly was not ashamed of being black—there was not a scintilla of self-hate in him—he disliked the term *African-American* and would not speak at events celebrating Black History Month, noting sadly that since descriptors of prominent white Americans did not include hyphens, neither should those that referred to him. Rather, like the title of his autobiography, he preferred to be known simply as *Benjamin O. Davis, Jr., American*. □

Bibliographical Note

The best source on Benjamin O. Davis Jr. is *Benjamin O. Davis, Jr., American: An Autobiography* (Washington, DC: Smithsonian Institution Press, 1991), which I refereed and made the first-cut edit. I also wrote a 15,000-word biography of General Davis for the Air Force Historical Foundation: "History on Two Fronts," in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington, DC: Office of Air Force History, 1987). My cover story on Davis's promotion to general for the summer 1999 issue of *Air Power History* incorporates remarks by President Bill Clinton. The cover photo shows the president and Davis's sister Lenora pinning on his fourth star. Clinton is wearing the red blazer of the East Coast Chapter of the Tuskegee Airmen, presented to him that day by men who flew with General Davis in Italy during World War II. The best account of the achievements of the Tuskegee Airmen is Stanley Sandler's *Segregated Skies: All-Black Combat Squadrons of WWII* (Washington, DC: Smithsonian Institution Press, 1992). For another scholarly account, see Alan M. Osur's *Blacks in the Army Air Forces during World War II: The Problem of Race Relations* (Washington, DC: Office of Air Force History, 1977). One can also find numerous mentions of General Davis and his father in the monumental, scholarly, and objective account by Ulysses Lee, *The Employment of Negro Troops* (Washington, DC: Office of the Chief of Military History, 1966). See also Morris J. MacGregor Jr.'s definitive *Integration of the Armed Forces, 1940–1965* (Washington, DC: Center of Military History, 1981). Less scholarly sources include Charles E. Francis's *The Tuskegee Airmen: The Story of the Negro in the U.S. Air Force* (Boston: Bruce Humphries, 1955); and Robert A. Rose's *Lonely Eagles: The Story of America's Black Air Force in World War II* (Los Angeles: Tuskegee Airmen, Western Region, 1976). For Davis's contribution to racial integration, see my book *The Air Force Integrates, 1945–1964*, 2d ed. (Washington, DC: Smithsonian Institution Press, 1998). For the best one-volume account of blacks in American military history, read Bernard C. Nalty's *Strength for the Fight: A History of Black Americans in the Military* (New York: Free Press, 1986).

The US National Security Strategy of 2002

A New Use-of-Force Doctrine?

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Editorial Abstract: Identifying terrorism as a distinct threat for the foreseeable future, the national security strategy of 2002 emphasizes preemption and prevention as a standard approach for dealing with that threat. This strategy produces a narrowly defined, controversial use-of-force doctrine that has many implications for the national military strategy.

EVEN A CURSORY review of the national security strategy (NSS) of 2002 reveals a document vastly different from any of its predecessors. Although one may consider such a difference appropriate for the post–Cold War period, as the basis for subordinate strategies such as the national military strategy (NMS), it deserves close scrutiny. Such an examination will show that the NSS defines a strategic environment completely different from the one that existed just a few years ago—perhaps even unique. Therefore, the potential for equally significant changes in US military strategy demands a critical study of the effect of the NSS on a subsequent NMS.

Toward that end, this article addresses the implications of the NSS on the use of military force in pursuit of national objectives. This new doctrine appears far less cautious and more proactive than the so-called Weinberger-Powell Doctrine, which has dominated US strategic-security thinking to this point, by permitting the use of force in a preventive or preemptive manner against entities based simply on their hostile capabilities and generally hostile intent. Before discussing use-of-force doctrine and attempting to understand how use-of-force concepts in the NSS differ greatly from the previous use-of-force doctrines, one would do well to review the Weinberger-Powell Doctrine.

Review of Weinberger-Powell

Regardless of what one thinks of the Weinberger-Powell Doctrine, any discussion of the use of force must include it—partly because, so far, (1) Weinberger-Powell remains the most prominent attempt to capture, in a single articulation, a coherent basis for use-of-force decision making; (2) it continues to influence US strategic thought; and (3) the fact that Colin Powell serves as the current secretary of state ensures that the rationale underlying this doctrine will play directly in current and near-term US foreign policy. However, the evolution of the doctrine's name from "Weinberger" to "Weinberger-Powell" is extremely unfortunate because, although similar in form and foundation, the authoritative discourses by each of these gentlemen on this issue (a speech delivered by Weinberger in 1984 and a journal article written by Powell in 1992) differ in critical ways.[1] In other words, as one finds out later, they are not the same doctrine. Nonetheless, the terms *Weinberger Doctrine* and *Weinberger-Powell Doctrine* usually refer to Weinberger's original "six major tests," as is the case in this article. However, the term *Powell Doctrine* alludes to the principles laid out by Colin Powell in his article. In any case, a critical review of both statements provides a necessary foundation for further discussion.

Definition of Doctrine

First, though, any attempt to analyze, develop, and evaluate doctrine requires an understanding of what it is. Because the originator of the Weinberger Doctrine was a senior government executive, one may be tempted to equate it with presidential doctrines such as the Monroe or Truman Doctrines. However, presidential doctrines tend to treat foreign policy at the grand strategic level in that they identify national principles or objectives without specifying particular economic, political, or military strategies. In contrast, use-of-force doctrines by their nature focus on the military instrument of power. For example, even though President Truman's message to Congress in 1947, which defined his doctrine, asked for a specific amount of economic aid for Greece, the doctrine itself addressed the principle that "it must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressures"; economic aid was merely a strategic action that supported this principle in the specific instance of Greece.[2] Furthermore, presidential doctrines are neither systematically formulated nor documented: one must extract the doctrines of Monroe and Truman from portions of their speeches; the full meanings of their doctrines have developed over time through the interpretations of others.

Although below presidential doctrine, strategic doctrine appears to reside above joint military doctrine, which consists of "fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application."[3] That is, joint military doctrine guides the consideration of how force should be applied—not the broader question of whether it should be applied. Use-of-force doctrines, then, appear to lie somewhere between presidential and joint doctrine: they are specific to the military instrument of power but should serve as guides that, coupled with the strategist's judgment, assist in determining if and how one should apply force as part of a military strategy.

The Weinberger Doctrine

Weinberger presented his six major tests for the use of force in a speech to the National Press Club in 1984 (table 1). Although he mentions virtually every US conflict that had occurred since World War I, he emphasizes that a use-of-force test does not lend itself to situations in which the decisive use of military power is clearly appropriate (e.g., defending a violation of one's national sovereignty) or inappropriate (e.g., an unprovoked violation of someone else's sovereignty). Rather, its utility lies in more ambiguous situations—the "gray-area conflicts" that have arisen so frequently since World War II—for which crafting a correct response has proved difficult. Although Weinberger uses historical examples from the interwar years—the Cold War, Korea, Vietnam, Lebanon, and Grenada—to support his tests and their underlying arguments, clearly, the specter of Vietnam heavily influences his thinking. Indeed, his summary is rife with the lessons of Vietnam: "The President will not allow our military forces to creep—or be drawn gradually—into a combat role. . . . This means we will need sustained congressional support. . . . These tests can help us to avoid being drawn inexorably into an endless morass. . . . But policies and principles such as these require decisive leadership in both the executive and legislative branches of government—and they also require strong and sustained public support."[4]

Although Weinberger calls his principles "tests," he does imply that one should use them as guides, as with joint military doctrine. For example, he indicates that the gray-area conflicts which demand critical thinking about the use of force will continue to challenge America for the foreseeable future and, by their nature, defy rote solutions. Furthermore, he describes them as "major tests to be applied when *weighing* the use of U.S. combat forces abroad. . . . I believe that these tests can be *helpful* in deciding whether or not we should commit our troops to combat" (emphasis added).[5] Nonetheless, the first and sixth tests certainly appear to be directives with little room for judgment.

Table 1. Comparison of Weinberger and Powell doctrines

	Weinberger Doctrine	*Powell Doctrine*
If force should be used	1. Vital national interests must be at stake. 5. There must be assurance of support from the American public and Congress. 6. Force must be a last resort.	1. Political objective must be important, clearly defined, and understood. 2. Objective must be supported by the American people (by implication). 3. Use of force must be able to be combined effectively with diplomatic and economic policies. 4. Risks must be acceptable. Force should be restricted to instances in which resulting good will outweigh loss of lives and other costs. 5. Actual (as opposed to threatened) use of force should come at the end of the plan.
How force should be used	2. Commit resources necessary to win. 3. Have clearly defined political and military objectives. 4. Continually reassess the relationship between objectives and size of forces.	6. Clear, unambiguous, and achievable objectives must be given to forces; must be firmly linked with the political objectives. 7. Decisive means and results should be preferred [Powell uses gradual escalation as a counterexample of "decisive"] unless US objectives call for something short of "winning" [Powell uses Libya, 1986, as an example of "objectives short of winning"].

Adapted from Caspar Weinberger, *Fighting for Peace: Seven Critical Years in the Pentagon* (New York, NY: Warner Books, 1990), 433–45; and Colin L. Powell, "U.S. Forces: Challenges Ahead," *Foreign Affairs* 71 (Winter 1992/93): 32–45.

Finally, Weinberger's is fundamentally a realist doctrine, an observation important to the analysis of use-of-force doctrines. The speech focuses exclusively on the instruments of national power, national interests, and threats to those interests; it says nothing of foreign interventions in the pursuit of values abroad. Furthermore, vital interests become the key criterion in answering the question of whether one should use force, and none of the six major tests uses values as a criterion: "We should only engage *our* troops if we must do so as a matter of our *own* vital national interest" (emphasis in original).[6]

The Powell Doctrine

Not specifically a use-of-force treatise, Powell's article "U.S. Forces: Challenges Ahead" forecasts the types of missions our nation would require of its armed forces and the capabilities necessary to accomplish those missions.[7] In it, he raises the issue of the use of force only as part of his larger discussion on the kinds of future missions our forces would have to execute. Acknowledging the inevitability of military operations other than war, he nonetheless characterizes as debatable the idea that the United States would commit its military to all types of missions involving the use of violent force. Consequently, his use-of-force concepts arise as a result of his exploration of the possibility of "violent force missions," so one finds references to them scattered throughout that section of the article. Thus, his use-of-force principles do not occur in a neat list, as do Weinberger's six major tests; rather, the reader must extract them from the text (table 1).

Unlike Weinberger, Powell does not devote significant effort to supporting his principles with historical examples; as a result, linkage between them and the specific experiences he cites is not clear. However, in his autobiography, Powell clearly demonstrates the effect of his experience in Vietnam on these principles: "War should be a politics of last resort. And when we go to war, we should have a purpose that our people understand and support; we should mobilize the country's resources to fulfill that mission and then go in to win. . . . I had been appalled at the docility of the Joint Chiefs of Staff, fighting the war in Vietnam without ever pressing the political leaders to lay out clear objectives for them."[8]

Powell intends to provide guidance—not an inflexible catechism. However, what appears, superficially, as an inconsistency in his discussion may obscure that intent for some readers: "To help with the complex issue of the use of 'violent' force, some have turned to a set of principles or a when-to-go-to-war doctrine. 'Follow these directions and you can't go wrong.' There is, however, no fixed set of rules for the use of military force. To set one up is dangerous."[9] Immediately following this criticism of principles and doctrine, however, he proceeds to provide a set of principles on if and how one should use force. But when Powell uses the terms *principles* and *doctrine*, he must mean, in this context, a checklist of "go/no go" criteria rather than guidance for making judgments. This sort of confusion underscores the importance of clearly defining doctrine and its purposes before undertaking any sort of critical analysis and development of doctrine.

Although Weinberger's statement is unambiguously realistic, Powell's is an eclectic collection of mixed, neutral, realistic, and idealistic language. The introduction and opening section of his article employ a thorough mix of both idealistic and realistic concepts. In discussing what tools America will use to lead the world, Powell lists the three traditional instruments (economics, politics, and armed forces) but adds a fourth: "The power of our beliefs and our values is fundamental to any success we might achieve."[10] The section of the article designated "Future Missions and Clear Objectives" makes no mention of either values or interests in the context of the use of force, and in "Future Military Structure," which outlines the force structure required to meet America's obligations, Powell takes a thoroughly realistic posture, mentioning threats, vital interests, and security arrangements as issues affecting force structure, never

mentioning values. But his closing section is predominantly idealistic: "What our leadership in the world does mean is that [peace, prosperity, justice for all, and the elimination of war] have a chance."[11]

Development of Use-of-Force Principles

Although both the Weinberger and Powell Doctrines have more than one test or principle for deciding whether or not to use force (see table 1), each has a "primary" principle that defines the critical issue for going to war. The remaining "if" principles are "permissive" ones that do not define the reason for using force but specify conditions that must exist to permit the use of force to proceed. The others—the "how" tests and principles—are "practical" guides for determining the appropriate ways of applying force. Unsurprisingly, Weinberger's principle no. 1 ("vital national interests") as well as Powell's principle no. 1 ("political objective must be important") both serve as each man's primary tenet. After all, Weinberger delivered a thoroughly realistic speech, and Powell clearly articulated both values and interests as motivations for US actions. Powell's doctrine includes two permissive "if" principles equivalent to Weinberger's no. 5 ("American support") and no. 6 ("last resort"). However, Powell adds two permissive principles: no. 3 ("force combined with diplomacy and economics") and no. 4 ("acceptable risks").

In general, the primary use-of-force principle defines the key issue over which one would use force. Permissive principles, by themselves, do not drive the use of force but must hold true for the use of force to proceed, typically because these conditions ensure successful attainment of national objectives. "Overwhelming support from the public" could serve as an example of a permissive principle. Practical principles guide how force should be used once the decision to do so has been made. Finally, "preferential" principles do not necessarily have to be true before one can use force, but if they are true, they strengthen the case for such use (table 2).

Table 2. Types of use-of-force principles

Primary principle	The main principle(s) based on the critical issue(s), which, if true, dictates the decision to use force.
Permissive principles	Principles that do not, by themselves, dictate the need to use force but express conditions that, in addition to the primary principle, must also be true to permit the use of force to proceed.
Preferential principles	Principles that do not necessarily have to be true for the use of force to proceed but, if true, positively influence the decision to use force. Preferential principles may be helpful when a use-of-force doctrine's primary principle or the situation to which one applies it is ambiguous.
Practical principles	Principles that guide not the decision to use force as much as the way force should be applied, if at all.

The National Security Strategy

Because use-of-force doctrines like those of Weinberger and Powell should rely on the prevailing strategic environment, the first step in searching for a new doctrine calls for understanding that environment, upon which the NSS is based. The next steps include analyzing the NSS for its primary, permissive, preferential, and practical principles for the use of force. According to the NSS, the end of the Cold War created the current strategic environment, in which the greatest threat to the United States no longer comes from conquering states but from failed ones and an "embittered few" that possess "catastrophic technologies."[12] The United States enjoys safety from conventional, peer competitors because it "possesses unprecedented—and unequaled—strength and influence in the world."[13] New US adversaries differ from their Cold War counterparts in several important ways. They are not conventional nation-states but terrorists and rogue states. They will use weapons of mass destruction (WMD) and other nonconventional means to attack—not to conquer but to instill fear. They will strike without warn-

ing; their soldiers will not be visible; and their primary targets will include civilians. This threat, a consistent theme throughout the NSS, clearly serves as the basis for that document's use-of-force strategies. Although chapter four, "Work with Others to Defuse Regional Conflicts," seems to address other conflicts that have concerned the United States in the past, the NSS without question emphasizes the terrorist threat.

The Search for Use-of-Force Criteria

To understand the implied use-of-force doctrine in the new NSS, one must comprehend not only the new strategic environment and threats, but also the concepts of preemption and prevention because they play heavily in the strategy. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines preemptive attack as one "initiated on the basis of incontrovertible evidence that an enemy attack is imminent."[14] One infers imminence from indicators such as mobilization of an enemy army on one's border. A preventive war, on the other hand, is "initiated in the belief that military conflict, while not imminent, is inevitable, and that to delay would involve greater risk."[15] Both preventive and preemptive attacks are proactive rather than reactive. Thus, preemption, prevention, and reaction represent three levels of threat response. At the greatest level of perceived threat, a nation believes an enemy attack is imminent and takes all necessary actions to preempt it. At the next lower level, a nation perceives the inevitability but not the imminence of an attack; in that case, the nation must weigh the risks of preventively attacking against those of doing nothing. Even if it decides to do nothing because it deems the greater risks lie in attacking preventively, the nation has still taken a proactive stance by choosing a course of inaction through rational consideration of the threat. Lastly, a nation may choose not to evaluate the nature of the threats it faces or endures a high-threat state—possibly even an attack—before taking any action.

The NSS prescribes the proactive approach, rejecting reaction as too risky in the current strategic environment because the dispersed, determined, and stealthy nature of terrorism makes attacks likely but difficult to detect and deter reliably. To the NSS, even a small percentage of successful attacks is unacceptable: "Given the goals of rogue states and terrorists, the United States can no longer solely rely on a reactive posture as we have in the past. The inability to deter a potential attacker, the immediacy of today's threats, and the magnitude of potential harm that could be caused by our adversaries' choice of weapons, do not permit that option. We cannot let our enemies strike first."[16]

Furthermore, the distinction between preemption and prevention is blurred in the NSS (which uses the terms almost interchangeably) because the concepts of inevitability and imminence no longer appear as criteria for proactive intervention. Two new criteria now apply: (1) status as a rogue state or terrorist organization and (2) possession of harmful capability. The NSS maintains that the United States should take action against rogue states or terrorists that merely possess the capability to harm us. Intent is either no longer an issue or is presumed within the definition of rogue states and terrorists: "The greater the threat, the greater is the risk of inaction—and the more compelling the case for taking anticipatory action to defend ourselves, *even if uncertainty remains as to the time and place of the enemy's attack*" (emphasis added).[17] The lack of distinction between preemption and prevention is consistent with how the NSS defines the prevailing threats. As already mentioned, allowing destructive capabilities to remain in the hands of radicals makes waiting to determine hostile intent too risky. Also, determining the extent of capabilities and imminence of attack and weighing the risks of action versus inaction are sufficiently difficult that the risk of waiting for perfect information becomes unacceptable. Hence, the NSS takes the approach that presuming hostile intent based

on possession of capability offers the most reasonable course—and is justified morally and legally, even if it means violating the sovereignty of states by "compelling [them] to accept their sovereign responsibilities."[18]

Hence, the existence of rogue states and terrorists radically motivated against the United States and its allies and in possession of harmful capability now stands as the NSS's critical issue for determining the use of force. Clearly, however, specific cases have varying priorities. For example, compared to an inevitable but not immediate threat, an imminent terrorist attack takes priority for intervention and the use of force. However, the issue becomes one of prioritization and allocation of military resources—not a judgment that the former case does not qualify for the use of force. The destructive power of each threat serves as another factor in the prioritization scheme, with WMD threats generally assigned a higher priority than others.

The NSS also delineates preferential principles for the use of force—preferential because they describe conditions desirable but not necessary in justifying action. Indeed, the first preferential principle for using force against rogue states and terrorists in a particular region calls for US partners in that area to take up a campaign that would localize threats, after which the United States would assist.[19] However, the NSS promotes the multilateral approach as its most prominent preferential principle. Not limited to the use of force, it recurs throughout the document and across all instruments of power. Yet, it remains a preferential principle because the United States reserves the right to act unilaterally in self-defense.[20] The NSS also appears to advocate two practical principles for using force: (1) the action must target and eliminate a specific threat and (2) the use of force should be measured (table 3).[21]

Although the NSS acknowledges, especially in chapter 4, that regional conflicts (of the "gray area" type around which Weinberger fashioned his tests) still exist and require US attention, that chapter contributes nothing to the furthering of use-of-force doctrine for such conflicts. In fact, both of its two strategic principles for dealing with regional conflicts have to do with international institutions and nation building.

Table 3. NSS use-of-force principles

Primary principle	Force should be used proactively against rogue states and terrorists that possess the capability and motivation to harm the United States and its allies.
Preferential principles	US partners in the region of interest should be the first to take up the fight, and the United States will assist.
	If the United States must use force, multilateral action is preferred, but the United States reserves the right to act unilaterally, if necessary, in self-defense.
Practical principles	The action must target a specific threat and eliminate it.
	The use of force should be measured.

Evaluation of the Criteria

One is struck by the narrowness of the NSS's critical issue and primary principles; it provides guidance on the use of force against rogue states and terrorists but not for any other scenario. For instance, the document offers no advice regarding the use of force in purely humanitarian situations such as Kosovo, in which the belligerents did not directly threaten the United States or support those who did. Such specificity makes the application of the doctrine easier than does Weinberger's "vital interests" or Powell's "political objectives," but it also limits the document's usefulness because it reduces the critical issue to something of a "no-brainer." In other words, the utility of use-of-force doctrines lies in resolving the use of force in gray-area conflicts, not in situations that obviously require the use of force.

The NSS does not specify using force as a last resort or as necessarily coupled to other instruments of power. The strategy's overarching approach to threats is indeed proac-

tive and parallel, advocating all traditional instruments of power and the support of allies and regional partners, but it does not preclude force as the first and/or only instrument. On the other hand, it describes the predominance of the instruments of power switching between two polar situations, one of which entails the nation building of failing states as a means of preventing the development of terrorism as early in its growth cycle as possible. If the country has not yet become a rogue state or has not sponsored terrorists, economic and political instruments are more appropriate than the military instrument. At the other extreme, an imminent terrorist attack calls for force more loudly than for economic or political solutions.

The NSS does not specifically call out American public support as a use-of-force principle. This stance is understandable considering that the doctrine advocates the use of force against entities that are, by definition, a threat to the United States. In contrast, as mentioned above, it does not deal with the use of force in situations such as Kosovo in which US interests are debatable. Furthermore, the NSS appears to go to great lengths to "prejustify" its preemptive/preventive approach as generally legal, moral, and logical, so that public acceptance of this justification equates to implicit public support of subsequent operations. Neither is the NSS doctrine explicit about using risk analysis to assist in the decision to use force. Again, that may not be necessary because the doctrine narrowly focuses on situations in which the risk factors for analysis, such as the determination and uncertain location of the enemy, are somewhat fixed. Finally, the NSS's practical principle of targeting a specific threat and eliminating it sounds akin to Powell's principle of having "clear, unambiguous, and achievable objectives" (see table 1).

One finds another significant difference between the NSS principles and the Weinberger and Powell Doctrines in their underlying beliefs about the role of American support. The latter doctrines presume that American public support is necessary but intolerant of casualties, failure, and ambiguity of purpose. Their principles, therefore, support quick and overwhelming courses of action in order to avoid Vietnam-like quagmires. The NSS assumes that the war on terrorism is necessary and, by its nature, necessarily protracted, so rather than mold the doctrine to address American tolerances, as do Weinberger and Powell, it crafts the strategies necessary to win the war and then tries to sell that strategy to the public.

Implications for US Military Strategy

If the military must strictly confine its strategy to the boundaries of the NSS, then US leaders, both military and civilian, should keep a doctrine like Weinberger's or Powell's in their hip pockets because the NSS provides use-of-force guidance for only a very narrow class of threats. Even if the national strategy proves correct in its prediction that these threats will become the most critical ones to US security for the next 20 years, it certainly admits at the same time that regional conflicts exist and require attention. Yet, its threat-based use-of-force doctrine seems far less relevant in those cases.

Furthermore, the NSS's doctrine on military strategy changes what civilian and military leaders used to agonize over. The NSS makes nonissues of such formerly sticky matters as whether or not the United States should use force at all and, if so, to what extent—at least for the terrorist cases. Leaders must now struggle with (1) how to find, fix, track, prioritize, and target threats against which the United States must use force and (2) how to apply force. The existence of rogue states as terrorist sponsors provided some level of localization of terrorists, which, in turn, made the task of identifying and targeting them somewhat easier. However, the US position, both in practice and as documented in the NSS, of armed intervention in rogue states is a double-edged sword. On the one hand, it forces the dispersion of terrorists, who then lose the benefits of state sponsorship. On the other, that same dispersion

makes finding, fixing, tracking, and targeting them much more difficult, and, given the extent of today's global communications, it may only marginally affect their functional cohesion. The dilemma for the military is that it cannot ignore terrorists based in rogue states because of the great advantages state sponsorship provides them, but the resulting dispersion makes subsequent operations more difficult. When it first targeted terrorists in rogue states, the United States may ostensibly have had the advantage of surprise, which helped eliminate most of the terrorists before they could disperse. However, with armed intervention now the standard practice, terrorists will be less likely to congregate so vulnerably. Applying force to such a dispersed enemy presents another challenge, made even greater by the covert integration of that enemy into civil societies, including that of the United States. Initially, we may not have believed that the transborder nature of terrorist organizations applied to US boundaries, but it does, and that may mean sharing the responsibility for the use of force with domestic agencies.

The final implication for the NMS involves overseas sustainment. Forward basing during the Cold War was integral to the strategies of that era. Subsequent practice called for a more expeditionary approach consistent with a smaller force structure and a disdain of lengthy deployments for fear of losing public support and getting into another quagmire. The United States preferred operations that would quickly and overwhelmingly accomplish its objectives, followed by an immediate withdrawal. For reasons explained earlier, that paradigm is entirely consistent with both the Weinberger and Powell Doctrines. However, the new paradigm anticipates a lengthy struggle with victory coming in increments.

So far, it appears that implementation of the NSS will indeed require protracted military operations, even military occupation, in some countries if the objective is truly to "eliminate" the threat. Certainly, the United States cannot withdraw its forces from Afghanistan at this time and expect the rule of law to prevail there. Likewise, the elimination of Saddam Hussein not only required an invasion, but also may necessitate a lengthy occupation of Iraq. Hence, even after the military overcomes the difficulties of finding and prioritizing targets and developing appropriate force-application strategies and tactics, the NSS seems to back the NMS into a corner. That is, the military must somehow take a force structure already strained from a high-operations tempo and sustain the lengthy deployment of forces to even more locations.

The Air Force's recent establishment of two transitional air and space expeditionary forces (AEF) provides a case in point. The normal three-month rotational deployment cycle of the 10 Air Force AEFs, designed "to bring deployment predictability to airmen and their families," was upset by "the operational demands of [Operation Iraqi Freedom] and other requirements."[22] The transitional AEFs supplemented the 10 standard AEFs, with the intention of meeting these increased operational demands. This is by no means a criticism of the AEF concept—rather, it is a tribute to its flexibility. The fact that the AEF cycle had to flex at all simply reflects the influence of the NSS's use-of-force doctrine: an aggressive, more resource-intensive military strategy for the global war on terrorism.

Conclusion

The use-of-force doctrine implied by the NSS differs markedly from the Weinberger or Powell Doctrines, but because the latter are products of an earlier strategic environment and the lessons derived from the military engagements of that era, such a difference seems natural. However, the NSS's heavy emphasis on the terrorist threat limits its threat-based use-of-force concepts to that class of conflicts even though the document also identifies regional conflicts as issues of strategic concern for the United States. Such conflicts gave rise to the Weinberger and Powell Doctrines, yet the NSS provides no guidance on the use of military force in those situa-

tions. Therefore, perhaps the most important lesson derived from this article is that US dominance has created a strategic environment that, although generally more stable, is vastly more diverse in its security threats. For that reason, it defies the development of a single use-of-force doctrine that is universal in its relevance and, at the same time, equally useful and specific in every situation. Thus, the post–Cold War environment makes the development of a universal or "silver bullet" use-of-force doctrine more challenging than at any other time in history. Therefore, this analysis has proved the wisdom of the joint definition of doctrine, for any use-of-force doctrine developed today can be no more than "fundamental principles by which the military . . . guide their actions," but the success of these principles ultimately "requires judgment in application."[23] □

Notes

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2. "Harry Truman and the Truman Doctrine," Truman Presidential Library and Museum, 2001, http://www.trumanlibrary.org/teacher/doctrine.htm.
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22. "Plan Will Get AEF Back on Track, Fix 'Disparity,' " http://www.af.mil/stories/123004843.shtml (accessed 30 September 2003).
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Global Air Mobility and Persistent Airpower Operations

JAMES MICHAEL SNEAD, P.E.

Editorial Abstract: In the 1930s and 1940s, two intriguing innovations surfaced: (1) a cargo aircraft with a detachable, missionizable fuselage module and (2) the ability to conduct long-endurance flights (nearly a month in duration). This article explores the potential operational impact of combining these two innovations into a new, global-range, modular aircraft system that provides significant new options for air mobility, deployment, and airpower-projection missions.

AS OPERATION IRAQI FREEDOM (OIF) highlighted, timely air mobility and sustainment of US military forces continue to require attention. An article in *Air Force Magazine* addressing early mobility lessons-learned from OIF noted that "demand for airlift far exceeds supply, and senior USAF officers say it is time to expand the fleet. . . . Airlift forces were pressed to their limits. . . . Gen. Tommy R. Franks, commander of US Central Command, was forced to modify his original war plan to live within USAF's 'constrained' airlift fleet. . . . [According to Gen John W. Handy, commander of the joint-service US Transportation Command and the Air Force's Air Mobility Command,] 'I firmly believe we need another Mobility Requirements Study.' "[1]

In May 2004, the Department of Defense initiated a mobility capability study—called for in the strategic planning guidance of 2004. According to Joint Staff briefing charts, the study will "identify and quantify mobility capabilities required to meet the end-to-end, full-spectrum mobility needs for all aspects of the national military strategy.[2] Also of interest, the secretary of defense's goal of being able to "deploy to a distant theater in 10 days, defeat an enemy within 30 days, and be ready for a new fight within another 30 days . . . will be used as a benchmark in the new study."[3]

This article proposes an approach for leveraging technological and operational innovation in global air mobility that can provide a highly flexible, time-responsive means of globally positioning and sustaining US military forces—not only on the land but also persistently in the air. This approach, embodied in the technological and operational features of an air-mobility concept known as the configurable air transport (CAT), offers a new alternative to the force commander for addressing the mobility, sustainment, and airpower-projection needs of twenty-first-century warfare.

The CAT is envisioned as a C-5-sized aircraft that has more than twice the unrefueled range of the C-5 and that carries an interchangeable module in lieu of the traditional fuselage. Thus—like a fighter or bomber—this aircraft can be configured for a particular mission by loading the appropriate airlift or airpower module. Depending upon the mission, the flexible CAT could carry modules for Airborne Warning and Control System (AWACS), missileer, traditional cargo, tanker, Army or Marine fire support (gunship), Navy sea patrol, emergency communications for the Department of Homeland Security, fighting forest fires, or international humanitarian relief, among others. Mission by mission, *if warranted*, individual aircraft in the CAT fleet could be reconfigured to respond rapidly to changing air-mobility, sustainment, and airpower-projection needs worldwide.

This mobility-system concept should prove attractive for modernizing the aging elements of the current air-transport fleet for two reasons. First, the CAT would provide a modern, global-range aircraft with standardized performance, basing, support, crew, and training that could offer, through the use of missionized modules, a modernization path for many of today's transport aircraft such as the C-5 airlifter, as well as the E-3 AWACS, KC-135 tanker, E-8C Joint Surveillance Target Attack Radar System (JSTARS), C-9 aeromedical-evacuation aircraft, and the B-52 bomber. Second, the use of missionized modules enables the introduction of new mission capabilities without reducing current ones or requiring costly and time-consuming modification of the CAT aircraft. Together, these features provide an attractive acquisition option for developing a new mobility system that would not only replace a broad range of aging aircraft as they reach the end of their economic lives, but would also continue to provide state-of-the-art warfare capabilities through the development and introduction of new or upgraded mission modules.

The article begins by examining an earlier modular aircraft—the Fairchild XC-120. Following a technical description of the CAT and its mission modules, the advantages of using these modules for transporting war materiel are addressed, with particular attention to establishing high-throughput global air bridges, prepositioning forces at regional bases, and rapidly moving air and land forces forward into bare bases. The article concludes with a description of how the multiday endurance capability inherent in such a new global-range transport, when equipped with airpower mission modules, would enable persistent airpower operations to be employed. This would provide new options for flexible and highly responsive global airpower projection similar to that proposed by the Navy in its "sea strike" and "sea basing" concepts. It would also provide new options for homeland security.

Fairchild XC-120 "Pack Plane"

In 1949, shortly after the initiation of production of the C-119 "Flying Boxcar" transport for the Air Force, that aircraft's manufacturer, Fairchild, experimented with a design variation that incorporated a detachable fuselage module (fig. 1). Called the XC-120 "pack plane," the transport aircraft lent itself to rapid reconfiguration in support of a variety of missions. One description of the XC-120 mentions that modules could deliver cargo as well as serve as shops, weather stations, emergency hospitals, and tankers.

The Air Force ordered production of over 1,100 C-119 aircraft but did not pursue the XC-120. Since then, other approaches for designing a modular air transport have under-

Figure 1. Fairchild XC-120 pack plane with detachable module. Courtesy of History Office, Air Force Aeronautical Systems Center.

gone conceptual definition in the United States and overseas. Like the XC-120, these did not attract serious interest by potential government or industry customers. Instead, industry stayed with the traditional tubular fuselage and wing-tail transport design that yielded aircraft optimized for and generally dedicated to a single mission, such as passenger carriage, large-cargo transport, and so forth. Today, as the Air Force assesses future air-mobility and airpower needs and solutions, the idea of a modular transport aircraft deserves renewed investigation.

Configurable Air Transport

The CAT is a C-5-/747-class aircraft that uses a blended-wing-body (BWB) design capable of carrying one interchangeable, missionized module (fig. 2).[4] The BWB concept is a modern version of the Burnelli lifting fuselage and Northrop flying-wing concepts of the 1920s, 1930s, and 1940s.[5] Since the mid-1990s, the National Aeronautics and Space Administration and the commercial aircraft industry have conducted technical evaluations of BWB designs and identified their potential for significant improvements in aircraft performance and reduced empty weight.[6]

Using a modified BWB for the CAT offers several advantages over traditional wing-tubular fuselage designs. In addition to having ample volume to carry the quantity of fuel needed for global range—usually 7,000 nautical miles (nm) or more—it also has sufficient volume for stowing the long landing gear required for the modular concept and for installing active self-defense systems, such as air-to-air missiles and directed-energy weapons.[7] The central area of the BWB, located behind the cockpit and over the module, can accommodate approximately 100 passengers in a manner similar to the C-5 Galaxy's upper deck. Alternately, one could configure the CAT's upper deck to provide crew-rest facilities for global-range cargo-delivery missions and for the new operational concept of persistent airpower operations, discussed later. Another design advantage is that the flat lower surface of the BWB design facilitates the mating of the large mission modules. Finally, the BWB's top-mounted engines should enhance survivability, reduce noise during takeoff and landing, and enhance multimission flexibility. For instance, this engine location opens up clear lines of sight for sensors and weapons mounted on the module, providing improved flexibility to configure modules to support a broad range of electronic and force-application missions. It also may enable the CAT to conduct amphibious operations, such as combat search and rescue or at-sea replenishment, with an appropriate amphibious landing module.

The conceptual CAT configurations in this article's illustrations reflect sizing to provide the same cargo volume as the C-5 but with ap-

Figure 2. Configurable air transport and detachable module. (Prepared by Dennis Stewart and Isiah Davenport, General Dynamics, Advanced Information Systems.)

proximately twice the unrefueled range. As a baseline for comparison, the C-5 is capable of carrying a maximum aircraft cargo load (ACL) of 178,000 pounds (89 tons) to an unrefueled range of approximately 3,200 nm. It has a maximum peacetime takeoff weight of 769,000 pounds, a wingspan of 223 feet, and a maximum fuel capacity of 51,150 gallons (322,500 pounds).[8]

Drawing upon a conceptual BWB aircraft design assessed by Boeing for an 800-passenger transport, the CAT concept carries a C-5-equivalent maximum planned ACL of 178,000 pounds (89 tons) to an unrefueled range of approximately 7,000 nm. This payload would correspond to 27 463L pallets, each with an average load of approximately 6,600 pounds. These figures yield an aircraft with a maximum takeoff gross weight of about 820,000 pounds, a wingspan of 280 feet, and a maximum fuel load of about 40,000 gallons (270,000 pounds).[9]

The BWB-based improvement in unrefueled global range of the CAT, when carrying the same payload weight as the C-5, has significant economic and operational advantages because of the reduced need for air refuelings and en route bases. This, in turn, leads to a reduction in both mission costs and total mission assets required. For example, aerial refueling costs approximately $175,000 for every 10,000 gallons.[10] For a global-deployment mission of 6,000 nm, the C-5 requires two KC-135 tankers transferring a total of 28,600 gallons.[11] Using the global range of the CAT to replace just one such C-5 air-refueled mission each month yields a mission cost reduction of approximately $6 million per CAT per year—or approximately $300 million for each CAT over its expected 50-year lifetime.

The typical CAT module would measure about 150 feet in length, 30 feet in width, and 17 feet in height. Internally, the module would have a 67-feet-by-27-feet flat floor (1,809 square feet) with a clear ceiling height of approximately 12 feet. The flat floor could accommodate 27 463L cargo pallets or rolling stock, with additional cargo stowage in the nose and tail cones. An unfurnished module would have an empty weight of about 75,000 pounds. Its upper surface would mate to the lower surface of the BWB by means of an electrically powered clamping system. The module's power system, on the order of 2,500 horsepower, would power an air-cushion system providing module mobility on the ramp and enabling the module to be positioned for mating to the CAT.[12] The self-contained power system would also provide auxiliary electrical power and environmental control for the module in flight and primary power when on the ground.

The modules would come in several basic configurations. One intended for frequent use (e.g., day-to-day cargo movement; AWACS; missileer; tanker; passenger transport; and aeromedical evacuation) could be fabricated using conventional methodology for aircraft design and assembly. Such a module would likely have a useful life of 25 years or more. Those intended for the surge transport of war materiel, including modules configured to support bare-base operations, could be built using alternative manufacturing methods and materials when lower production costs and increased production rates are emphasized. The goal would be an "expendable" module design enabling the economical production of hundreds of "war-ready" modules for placement in ready storage during times of peace, while also enabling the rapid and affordable replenishment of modules expended during hostilities.

Cargo Handling and Transport

Cargo handling and transport involve the basic operations of receiving, organizing, loading, transporting, unloading, warehousing, and distributing cargo from the point of origination to the end user. Several approaches have sought to improve the throughput efficiency of this process, starting with the most obvious of increasing the speed of the transportation system. After attainment of the maximum economic cruise speeds, further improvement requires a more fundamental change in the cargo-handling process.

Land-Sea Cargo Transportation Using Standardized Intermodal Containers

For land-sea cargo transportation, a revolutionary improvement in throughput occurred in the mid-1950s by applying an idea that originated in the late 1930s—using standardized, intermodal cargo containers for both land and sea transportation.[13] This approach resulted from recognizing that loading cargo containers from trucks to ships and back to trucks was far more time efficient than the millennia-old manual handling of individual pallets, boxes, bags, vehicles, and so forth. The new containerized approach reduced the nonrevenue-generating time of both ships and trucks by lessening the time spent waiting and finally loading and unloading. Consequently, one needed fewer ships, trucks, and dockside workers for a given throughput and revenue-generating capacity. Because of today's improved material-handling automation, computerized tracking of cargo containers, permanent dockside material-handling equipment, and well-trained personnel, workers need fewer than 50 hours dockside to unload and load a 3,000-container "lift-on/lift-off" cargo vessel. Ship-utilization efficiency—the time actually spent transporting cargo and generating revenue—comes to approximately 85 percent for transpacific use.

Module Loading and Unloading from the CAT

Similarly, the CAT modular concept speeds the loading and unloading of the cargo, thus improving the overall transportation-utilization efficiency of the aircraft and minimizing the required ramp space. Examination of movies of the XC-120 module's unloading operations and a simplified visualization of detaching a module from the CAT suggest that it may be possible to drop a module in as little as 10 minutes following arrival at the designated module-release spot on the ramp. For the one-way transfer of cargo into an air base, the CAT would land, taxi, drop the module, taxi, and then take off without stopping the engines. The total time spent on the ground might amount to only 20 minutes. By way of comparison, the C-5's ground time for unloading cargo without refueling or reconfiguration is 120 minutes.[14]

Attaching a module to a CAT, however, will be more complex. We could use an automatic mating system on the CAT that precisely locates the module and provides guidance cues so that the pilot can accurately taxi the aircraft into position above the module. After final alignment of the module using the air-cushion system, the actual mating would take about 10 minutes since it would involve the same basic aircraft and module operations used to drop a module—only conducted in reverse.

A preliminary time allocation, consistent with the assumptions above, indicates a total CAT time on the ground of approximately 140 minutes: 10 minutes for taxiing following landing, 10 minutes to drop the module, 60 minutes to taxi and refuel the aircraft, 20 minutes to taxi and position the CAT to pick up the next module, 10 minutes to pick up a module, 20 minutes for anomaly resolution and final checks, and 10 minutes to taxi to the runway for takeoff.[15] Without refueling, the total time would approach 80 minutes. If crews could refuel the aircraft and load/unload the module simultaneously by using the mobility of the modules to move them to and from the CAT during refueling, then the total ground time would also come to about 80 minutes. The C-5, for comparison, requires 500 minutes of planning ground time for unloading cargo, refueling, reconfiguring the cargo compartment, and loading cargo.[16]

Simple Model of a CAT Air Bridge

A first-order system-dynamics simulation of a CAT air bridge identified the number of aircraft needed, based on assumptions for flight frequency and ramp-space requirements at the aerial port of debarkation (APOD). This model simulated a global-delivery mission to a distance of 6,500 nm *without air refueling or en route base stops*—for example, one way from McGuire AFB, New Jersey, to Qatar in the Persian Gulf. At an assumed departure rate of three CATs per hour, 84 aircraft would establish a constant-throughput air bridge, deliver-

ing 72 modules carrying an average of 4,400 tons per day (using a planning cargo load of 61.3 tons) for an airlift capacity of 28.6 million ton-miles per day.[17] Using the assumptions stated above for ground operations for nonsimultaneous unloading/loading of modules and fueling activities, one would need seven ramp parking places at the APOD to swap modules, refuel the CATs, and prepare for the return flight. The total round-trip time from departing the aerial port of embarkation (APOE) to departing for the next trip is approximately 31.5 hours. One would also need a minimum of seven ramp parking spaces at the APOE. Turning to the C-5 once again, one sees that the *ideal* maximum daily cargo throughput for 52 arrivals per day, assuming seven ramp parking places, carriage of the maximum ACL, no reduction for ramp-queuing inefficiencies, no loading constraints, and *no en route air refueling or basing constraints*, would amount to 3,200 tons.

This simple air-bridge model was applied to the movement of a 5,000-person Army brigade with 12,000 tons of materiel to a distance of 6,500 nm. A planning cargo load of 61.3 tons was assumed, as was the fact that each CAT could also carry up to 100 soldiers in the upper deck. With a 20-minute departure spacing, the 84 CATs completed the movement of personnel and cargo in approximately 95 hours from the time the first aircraft departed the continental United States (CONUS) until the last one returned and had been unloaded and refueled. With a 30-minute departure spacing, 56 CATs completed the needed 196 missions in approximately 127 hours. Focusing on the 10-day deployment goal of the aforementioned mobility-capability study, one sees that each 84-CAT air bridge would be capable of delivering 41,000 tons of war materiel or about three Army brigades.

One criticism of the comparison of air-bridge models of the CAT and C-5 points out that the cargo in the module unloaded from the CAT is not necessarily unloaded, whereas the ideal throughput for the C-5 includes unloading the cargo. This is not actually the disadvantage it appears to be. The primary objective of using modules for moving cargo is to improve utilization efficiency of the transport aircraft. Detaching the module, moving it away from the aircraft parking spaces, and then unloading it all help to ensure a high CAT-utilization efficiency by preventing difficulties in unloading cargo—engines on rolling stock that will not start, jammed cargo restraints, lack of sufficient unloading crews or equipment, and so forth—from interfering with the processing and departure of the CATs. Further, depending on available ramp space, it is not necessary to unload the modules immediately since they provide environmentally protected and controlled storage of the cargo. A ramp area of 2,500 feet by 600 feet at the APOD could store approximately 100 modules containing 6,100 tons of war materiel. Also, with appropriate training, the arriving troops (as in the above example of the Army brigade) could unload their own equipment without the need for large numbers of Air Force personnel. Additionally, the emptied modules could serve as temporary shelter until their return.

Overcoming Limitations on Fuel Availability

Like other large air transports, the CAT requires a secure and plentiful supply of fuel. In the air-bridge example cited above, if the CATs required refueling at the APOD, the daily pumping requirement would reach approximately three million gallons. To meet these needs, the base would require a substantial hydrant-fueling network and fuel-storage capacity. Since forward locations will probably not include such facilities, one approach for establishing high-throughput transport of modules into an area like this would involve flowing the CATs through a network of regional bases (described in the following section) to the APOD. (Andersen AFB, Guam—a potential regional base in a global CAT distribution network—has a fuel-storage capacity of approximately 66 million gallons.)[18] The global-range capability of the CATs permits them, unlike the C-5s, to fly 3,000 nm from the regional base into the APOD and return the same distance to the base without either refueling at the APOD or air refueling en

route. One could establish APODs to handle a throughput of up to 2,900 tons per day, with a planning cargo load of 61.3 tons, at forward locations that would otherwise not be available due to a lack of aircraft-fueling capacity. A continuous 3,000 nm air bridge from the regional base to and from the APOD, with 30-minute spacing, would require 28 CATs. Moving the Army brigade, for example, would require about five days to complete. Because the aircraft would not have to refuel at the APOD, they would need only three ramp parking spots to sustain this throughput.

Global Distribution Network

One could establish a network of CONUS and overseas regional bases—for example, eastern and western CONUS, Hawaii, Guam, Alaska, Diego Garcia, and western Europe—to support the rapid global delivery of CAT modules to APODs located in most locations of interest (fig. 3). The longest route length, using a great circle, comes to 5,200 nm. The unrefueled global range of the CATs would allow them to move between these bases without en route air refueling. With this operational model, including an overlay of 3,000 nm operating radii from each of the bases, CATs transporting modules would then fly from the CONUS APOE to pick up the loaded module and then to the APOD, using regional bases for fueling and crew rotation. Returning CATs would pick up empty and unneeded modules and bring them back through regional bases to CONUS terminals for reuse.

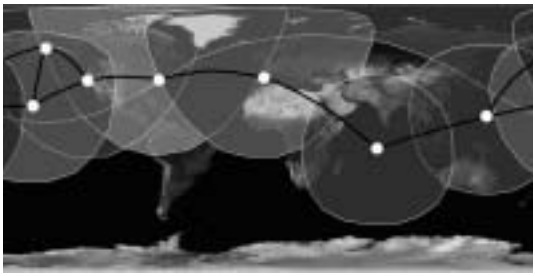

Figure 3. CAT module and tanker coverage from the CONUS and regional bases

Materiel Prepositioning and Rapid Delivery

Prepositioning of materiel to support the rapid deployment of military forces has become increasingly important. The CAT modules provide a means to environmentally protect, preload, and securely store the first-entry combat forces' air-transported equipment, supplies, and forward-base facilities in the CONUS and at regional bases without using permanent warehouses. After activation of such forces, crews could "float" the modules containing stored equipment on the modules' air cushions to the designated module-loading location on the ramp to await arrival of the CATs and initiation of the air bridge to the designated APOD.

Prepositioning of preloaded modules integrates well with the global unrefueled range of the CAT. The CATs' ability to fly to an unrefueled range in excess of 10,000 nm (without modules) allows the rapid repositioning of these aircraft with minimal or no demand for en route basing or air refueling. In case of an emergency, designated CATs conducting normal air-mobility missions worldwide would land at a US or allied air base, drop their modules, and refuel. Less than 90 minutes after landing, the CATs would be en route to the designated regional base, where they would pick up prepositioned modules and carry them forward to an APOD or, as discussed later, undertake airpower-projection missions.

CAT Tanker

A tanker module will allow CATs to function as strategic tankers. For mission-assuredness purposes, such a module would have twin, high-capacity refueling booms to support the refueling of large aircraft such as the B-1, B-2, C-17, and C-5, as well as other CATs. The tanker module would have an off-load capacity of approximately 200,000 pounds at an operating radius of 3,000 nm from the CONUS and regional bases (fig. 3). On a shorter-duration mission—radius of about 500 nm—additional fuel from the CAT's wing tanks could increase the off-load capacity up to approximately 350,000 pounds. The KC-135E, in comparison, has an off-load capacity of 101,200 pounds

and 10,500 pounds at mission radii of 500 nm and 2,500 nm, respectively.[19]

Modules providing tanker capability can be equipped to dispense fuel while parked on the ground. With a storage capacity of approximately 35,000 gallons and a self-powered fuel-pumping system, these modules could store and dispense fuel at forward bases—an important feature since ever-more US aircraft and ground equipment use the same JP-8 fuel. Hence, CAT tankers could use the module to escort tactical aircraft to an in-theater air base and then leave the module to support local air and ground operations.

In addition to the use of tanker modules for dedicated air-refueling missions, all CATs will probably feature permanent, wing-mounted refueling systems to air-refuel fighters and unmanned aerial vehicles (UAV). Installing a lower-capacity boom on one wing and a probe-and-drogue system on the other would permit all CATs, regardless of the transport or airpower-projection mission performed, to serve as emergency en route tankers and permit airpower-projection CATs to "top off" fighter escorts.

Bare-Base Support

The forward deployment of military forces often requires the establishment of operations at bare bases—that is, air bases or commercial airports where the runways, taxiways, and ramps are usable or rapidly repairable but where the supporting capabilities, such as fuel storage and power generation, are either not available or not readily repairable. To support the deployment of military forces into these bases, the Air Force uses prepackaged, transportable bare-base kits called Basic Expeditionary Airfield Resources, assembled at the bare base by Air Force civil-engineering teams.

CAT modules provide a new approach for these kits. Instead of using tents and erectable buildings, base personnel could utilize special versions of the CAT war-ready module for shelter. We can easily visualize the establishment of initial tactical air operations at a bare base using missionized CAT modules (fig. 4). In this example, a delivery rate of up to four modules per hour reflects the circumstance that CATs would not pick up modules for the return flight and that these aircraft do not need refueling. This delivery rate yields a total timeline of approximately seven hours:

- Time = 0 hour. Initial security forces and base-opening civil engineers arrive via C-130s. Planned module locations have been preestablished, based upon satellite and UAV surveillance information.
- Time = +2 hours. CATs deliver three modules for air base defense, and crews move them on the modules' air cushions to defensive locations away from the ramp. Two modules contain surface-to-air missiles and Phalanx-type air defense guns, while a third contains an antimissile/aircraft laser and target-acquisition radar. Laser defenses would also protect against artillery, mortar, rocket, and similar munitions. Operating crews for these defensive systems, as well as additional Air Force civil engineering teams, fly to the bare base in the upper deck of the CATs that deliver these modules. A fourth CAT, on the ramp (fig. 4, upper right), delivers the first Army module containing more ground-defense equipment.

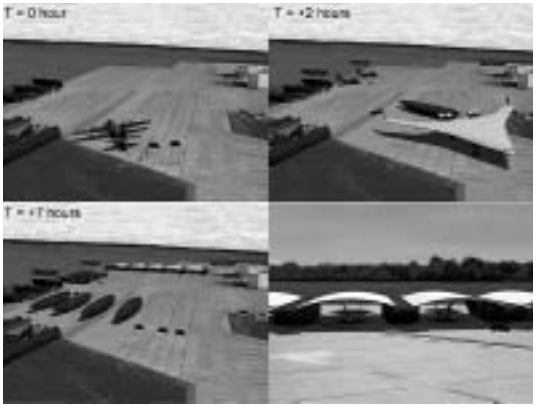

Figure 4. Bare-base buildup. (Prepared by Dennis Stewart and Isiah Davenport, General Dynamics, Advanced Information Systems.)

- Time = +3 hours. Four Army modules (fig. 4, lower left) containing up to 245 tons of equipment and 400 soldiers arrive. After they empty the modules, personnel use them for temporary quarters and protection against chemical, biological, and small-arms attack.
- Time = +5 hours. Six modules designed to support tactical air operations arrive and are placed at the far end of the ramp. Personnel erect air-supported canopies between the modules to provide shelter for conducting maintenance and weapon loading on the tactical aircraft (fig. 4, lower right). Air Force civil engineers as well as operational-support personnel arrive in the CATs that transport these modules.
- Time = +7 hours. The final four modules containing fuel, water, and munitions arrive, as do the tactical aircraft in preparation for initiating local air operations. Subsequent deliveries replenish these modules and return the empty ones for restocking.

The bare-base CAT modules would be specially designed for this application, providing nuclear, chemical, biological, environmental, acoustic, and ballistic protection for forward-deployed forces. They might also contain active self-defense capabilities, including tactical lasers. The auxiliary power system used to run the air cushion would also provide electrical power and environmental control. The configuration of the interior of the modules would incorporate many specialized logistical-support functions that would normally require the erection or assembly of separate facilities—air and space operations centers, secure communication facilities, crew quarters, hospitals, mess facilities, maintenance shops, small-arms arsenals, fuel-storage areas, munitions shelters, recreation facilities, and so forth. Upon completion of the mission, crews would reload the modules on the CATs for return to the CONUS for cleaning, repair, and replenishment. Many of these modules would also prove useful in humanitarian-relief operations. A key feature of this use of CAT modules is the ability to repack and relocate them quickly. In the example above, four CATs with tanker support could relocate these modules to another base 1,000 nm distant in about 20 hours, thus providing substantial flexibility for repositioning theater air forces as the operational campaign unfolds.

Persistent Airpower Applications

In early 1929, shortly after Charles Lindbergh's famous 34-hour flight in 1927, Maj Carl Spaatz and Capt Ira Eaker of the US Army Air Corps initiated an effort to investigate long-endurance flight.[20] In the Air Corps's three-engine Fokker C-2A *Question Mark*, they, along with Lt H. A. Halverson, Lt E. R. Quesada, and Sgt R. W. Hooe, established an initial endurance record of just over 150 hours, involving 42 air-refueling and resupply hookups. In one of many endurance efforts undertaken later that year, Dale Jackson and Forest O'Brine established a new record of 420 hours in a single-engine Curtiss Robin, increasing the record in 1930 to 647 hours in the same plane.[21] Five years later, brothers Fred and Algene Key extended the record to 653 hours (27 days), again in a single-engine Curtiss Robin.[22] In this 1935 record flight, the Keys completed 432 hookups to transfer fuel, oil, and supplies and flew a ground track of over 52,000 miles.

Almost 70 years later, one has trouble locating these endurance records in the history books. Contemporary planners regard the 40-hour missions of B-2s as remarkable and assume they are pushing the edge of the envelope of human and hardware endurance. Yet, clearly this is not the case. In fact, this area of potential technology exploitation can lead to the establishment of a new paradigm of persistent airpower operations in which we could fly critical military capabilities into forward air bases. Such capabilities would provide persistent deterrence or force application when land bases are unavailable/threatened or when sea-based forces have not yet arrived. With suitable onboard areas for crew rest and multiple flight crews, persistent airpower operations

with CATs would begin to emulate naval operations with a corresponding influence on the types of airpower capabilities used, joint operations undertaken, and Air Force and joint doctrine executed.

In December 2002, Vice Adm Cutler Dawson and Vice Adm John Nathman of the US Navy discussed the advantages of the persistent forward projection of sea power:

> Sea Strike is a vision of what we will become as well as the focus of our capability today. It is about far more than putting bombs on target, although the delivery of ordnance remains a critical function. At its heart, Sea Strike is a broad concept for naval power projection that leverages C5ISR (command, control, communications, computers, combat systems, intelligence, surveillance, and reconnaissance), precision, stealth, information, and joint strike together. It amplifies effects-based striking power through enhanced operational tempo and distant reach. It takes U.S. power to the enemy 24 hours a day, 7 days a week, creating shock and awe both immediately and persistently. Sea Strike is what it takes to win in the 21st century.[23]

Similarly, in January 2003, Vice Adm Charles W. Moore Jr., US Navy, and Lt Gen Edward Hanlon Jr., US Marine Corps, discussed the twenty-first-century advantages of sea basing:

> Sea Basing is the core of "Sea Power 21." It is about placing at sea—to a greater extent than ever before—capabilities critical to joint and coalition operational success: offensive and defensive firepower, maneuver forces, command and control, and logistics. By doing so, it minimizes the need to build up forces and supplies ashore, reduces their vulnerability, and enhances operational mobility. It leverages advanced sensor and communications systems, precision ordnance, and weapons reach while prepositioning joint capabilities where they are immediately employable and most decisive. It exploits the operational shift in warfare from mass to precision and information, employing the 70% of the earth's surface that is covered with water as a vast maneuver area in support of the joint force.[24]

We could realize many of the operational advantages inherent in "sea strike" and "sea basing" through persistent airpower operations involving CATs. Operating from the network of regional bases described earlier, groups of perhaps as many as eight CATs with appropriate airpower modules could patrol designated areas within a 3,000 nm radius of the regional or CONUS base for periods of several days (fig. 5). CAT tankers operating from these same bases would air-refuel the patrolling CATs every 12 to 18 hours. These "air battle groups" would provide the ability to rapidly establish air superiority, demonstrate national resolve, support allies, and, if necessary, project airpower without the need to first establish forward land-operating bases within the theater of operations. These persistent airpower operations would emulate deep-ocean naval operations but with the advantage that the entire surface of the planet would become accessible.

Such an air battle group might consist of CATs carrying the following types of modules:

Figure 5. CAT AWACS, cargo, unmanned combat air vehicle (UCAV) flying tender, and direct-fires-support module. (Prepared by Dennis Stewart and Isiah Davenport, General Dynamics, Advanced Information Systems.)

- Integrated flight-operations center, AWACS, and JSTARS for battlespace situational awareness and battle-group command and control (C2).
- Airborne laser for missile defense and self-defense of air battle group.
- Standoff-attack module carrying 50 2,000-pound missiles capable of Mach 7 speed and a range of 1,000 nm for rapid, precision strike.
- Ballistic-missile-defense module carrying 40 3,000-pound air-launched antiballistic missiles for defense against theater ballistic missiles.
- Direct-fires-support module carrying twin 155 mm cannons; multiple tactical lasers; and medium-range, precision-attack munitions to provide sustained fires support for special operations forces and to defend US and allied forces, including forward bases.
- UCAV flying tender carrying two Mach 3.5 UCAVs and 400 precision-attack munitions to conduct battlespace surveillance and attack.
- CAT tankers for refueling fighter escorts.

Just as the US Navy puts its carrier battle groups to sea during times of increased threat as a show of force and to increase forces deployed forward, the air battle group offers similar possibilities for airpower. These unique CAT advantages—global unrefueled range, which enables the quick repositioning of CATs; rapid mission reconfiguration using airpower modules prepositioned at regional bases; and multiday endurance with refueling—allow the Air Force to rapidly assemble, project, and sustain airpower virtually anywhere in the world. Within 12 hours or less, if CAT air battle groups are already airborne, the Air Force could provide a first and significant response to threatening forces or could engage attacking forces with substantial, long-range, precision firepower. Within 24 to 36 hours, we could globally reposition, refit, and send forward 10s of additional CATs to sustain the initial airpower operations and link up with other arriving joint forces. CATs could become core elements of the military's "first-response" air and space force.

The CAT concept would also support homeland defense. CATs flying multiday air-patrol missions could undertake missions such as ISR, ballistic and cruise missile defense, counter-smuggling detection, negation of captured airliners or ships, C2, and airborne communications. CAT modules similar to those used for forward bare-base support could be used for postattack support in areas temporarily isolated from ground access and communication. Finally, one could possibly adapt CAT tanker modules to support fighting forest, pipeline, and urban fires resulting from terrorist attack or other causes.

The CAT UCAV flying-tender module (figs. 5 and 6) highlights the flexibility in new operational approaches enabled by the CAT and its modules. In this concept, a CAT serves as the flying tender for two 15,000-pound UCAVs, rearmed and refueled by the tender module. Preliminary estimates indicate that each UCAV could carry four 250-pound precision-guided weapons to an operating radius of 750 nm at a cruise speed of Mach 3.5. Assuming the CAT orbits 300 nm outside "Red's" border, the UCAVs could strike targets and conduct surveillance up to 450 nm inside of Red. At this maximum combat radius, the UCAV would have a mission cycle time of approximately one hour. Each CAT tender and its twin UCAVs could attack eight targets each hour or approximately 200 targets per day. At closer distances, each tender's UCAVs could attack up to 24 targets per hour. The CAT's UCAV tender module would carry approximately 400 250-pound munitions—enough for 100 reloads of the UCAVs.

The UCAVs on each tender could also conduct 50 or more ISR sweeps within the battlespace during each 24 hours to augment other air and space capabilities. Advanced communication systems, perhaps using direct-line-of-sight lasers, would link the UCAVs and the tender aircraft to provide real-time C2 of the former throughout most of the mission. Further, outbound UCAVs could relay ISR data

Figure 6. *Left*: a CAT's UCAV flying-tender module. *Right*: an in-flight UCAV rearming. (Prepared by Dennis Stewart and Isiah Davenport, General Dynamics, Advanced Information Systems.)

identifying high-priority targets to the C2 CAT, which could then relay updated target lists to inbound UCAVs, thereby providing a responsive deep-strike capability.

CAT Crisis-Augmentation Capabilities

The Air Force relies upon the CRAF to augment organic military-transport capabilities during times of crisis. The versatility of the CAT offers a new approach to providing crisis augmentation. A government-owned, contractor-operated fleet of CATs, notionally called Eagle Air (fig. 7) and manned by Air Force Reserve and retired aircrews, could perform the bulk of the day-to-day movement of CAT modules to support peacetime operations of the US military and humanitarian and peacekeeping operations of the US government. For one weekend a month and two weeks each year, the CATs and their Reserve crews would train with the assigned active duty air-mobility units. In times of crisis, these Eagle Air CATs could then quickly activate, integrate into their active duty units, and conduct virtually all of the air-mobility and airpower-projection missions.

Figure 7. A CRAF Eagle Air CAT loading Army rapid-deployment modules. (Prepared by Dennis Stewart and Isiah Davenport, General Dynamics, Advanced Information Systems.)

Conclusion

> *[We need] a future force that is defined less by size and more by mobility and swiftness, one that is easier to deploy and sustain, one that relies more heavily on stealth, precision weaponry and information technologies.*
>
> —President George W. Bush

Transforming the ability to move and sustain US military forces is, as President Bush stated, critical to preparing US military forces for the future and providing the president with the military capability needed to effectively protect and defend the United States and its allies.[25] This article has attempted to respond to this need by describing how advanced aeronautical technologies, combined

with an innovative modular system architecture, offer the potential to significantly increase the air mobility and sustainment of US military forces. In particular, the article has sought to show how the air mobility aspects of the secretary of defense's goal of being able to "deploy to a distant theater in 10 days, defeat an enemy within 30 days, and be ready for a new fight within another 30 days" may be achievable. Further, the article has tried to demonstrate that this modular-system architecture may provide a cost-effective means of modernizing our aging air-transport fleet with an innovative aircraft system that provides air mobility, sustainment, and airpower-projection capabilities that will significantly enhance the responsiveness and agility of US military forces well into the future. □

Notes

1. John A. Tirpak, "The Squeeze on Air Mobility," *Air Force Magazine* 86, no. 7 (July 2003): 23, 24, 25, http://www.afa.org/magazine/July2003/0703mobility.asp.

2. Jason Sherman, "DoD Study May Pit C-17s, Fast Ships vs. Fighters," *Defense News*, 21 June 2004, 1.

3. Ibid., 8.

4. The CAT is one of 66 futures war-gaming concepts defined and assessed in the Air Force Technology Seminar game conducted by the Air Force Research Laboratory in 2000–2001 in partnership with the Air Force Directorate of Strategic Planning.

5. "Northrop's Flying Wing Airliner," in *Glen Edwards and the Flying Wing: The Diary of a Bomber Pilot*, *The Warbird's Forum*, November 2003, http://www.danford.net/paxwing.htm.

6. "The Blended Wing Body: A Revolutionary Concept in Aircraft Design," *NASA Facts Online*, 24 April 2001, http://oea.larc.nasa.gov/PAIS/BWB.html.

7. The notional CAT design includes a landing-gear configuration derived from the design of the B-58 bomber of the late 1950s. The B-58 had a high wing—about 7.5 feet—and carried a large centerline fuel pod. Its landing-gear design used a simple structural configuration and fold mechanism that yielded an extremely light landing-gear weight fraction, despite its long length.

8. Air Force Pamphlet (AFPAM) 10-1403, *Air Mobility Planning Factors*, 18 December 2003, 12, table 3, http://www.e-publishing.af.mil/pubfiles/af/10/afpam10-1403/afpam10-1403.pdf; C-5 Galaxy Fact Sheet, http://www.af.mil/factsheets/factsheet.asp?fsID=84; and C-5A/B Galaxy, http://www.fas.org/man/dod-101/sys/ac/c-5.htm.

9. These estimates are based on aircraft size and performance for a large Boeing BWB conceptual aircraft. See "Boeing Blended Wing Body Large Commercial Transport," *Jane's All the World's Aircraft*, 14 July 2003, www.janes.com.

10. This assumes an average air-refueling cost of $17.50 per gallon of fuel, as reported in "B-52 Re-engining, Financing Plan Endorsed," *Aerospace Daily*, 8 April 2003.

11. AFPAM 10-1403, *Air Mobility Planning Factors*, 18, table 11.

12. As an interesting point of comparison, General Motors recently showed a concept car that included a 1,000-horsepower V-16 engine.

13. This idea, originated by Malcolm McLean in 1937, was not put into practice until 1956. His Sea-Land Corporation initiated the concept of commercial, containerized cargo transport. See http://americanhistory.si.edu/onthemove/exhibition/exhibition_17_2.html. In 1950 the United States Army developed a similar concept called "CONEX" that saw extensive use in Vietnam; it has led to today's military use of intermodal containers.

14. AFPAM 10-1403, *Air Mobility Planning Factors*, 14, table 5.

15. This scenario assumes a hydrant system for refueling with two hookups to the aircraft, each with an average flow rate of 450 gallons per minute. Onloading 30,000 gallons of fuel would take approximately 45 minutes.

16. AFPAM 10-1403, *Air Mobility Planning Factors*, 14, table 5.

17. For C-5 planning cargo load, see ibid., 12, table 3.

18. A1C Claudia Garcia-Strang, "Andersen to Have Largest Fuel Storage Contractor to Turn Over New Tanks Soon," *PACAF News*, 17 October 2002, http://www2.hickam.af.mil/newsarchive/2002/2002217.htm.

19. AFPAM 10-1403, *Air Mobility Planning Factors*, 17, table 10.

20. "Flight of the Question Mark," *USAF Museum History Gallery*, http://www.wpafb.af.mil/museum/history/postwwi/fqm.htm.

21. Capt Franklyn E. Dailey Jr., USN, retired, *Socked In! Instrument Flying in Northern Latitudes*, 2002, appendix A, "Aviation Events, 1929–31," http://www.daileyint.com/flying/flywara.htm.

22. "Curtiss J-1 Robin: 'Ole Miss,' " *Smithsonian National Air and Space Museum*, http://www.nasm.si.edu/research/aero/aircraft/curtiss_j1.htm.

23. Vice Adm Cutler Dawson and Vice Adm John Nathman, USN, "Sea Strike: Projecting Persistent, Responsive, and Precise Power," US Naval Institute *Proceedings* 128, no. 12 (December 2002), http://www.usni.org/proceedings/Articles02/PROdawson12.htm.

24. Vice Adm Charles W. Moore Jr., USN, and Lt Gen Edward Hanlon Jr., USMC, "Sea Basing: Operational Independence for a New Century," US Naval Institute *Proceedings* 129, no. 1 (January 2003), http://www.usni.org/proceedings/Articles03/PROseabasing01.htm.

25. Department of Defense, *Transformation Planning Guidance*, April 2003, 3, http://www.defenselink.mil/brac/docs/transformationplanningapr03.pdf.

Airpower 101

An Expeditionary Air Base Model

COL JOHN DOBBINS, USAF

Editorial Abstract: This article proposes a simple but powerful model for base-level command to use in organizing, writing, and assessing bare-base-support plans; determining buildup priorities; and executing bare-base operations. The author believes that the model could become a common Air Force construct, standardizing language so that all levels of command can understand and coordinate with each other on how to generate airpower from a bare base.

THE AIR FORCE must document the lessons learned from standing-up and operating bare bases during Operation Iraqi Freedom (OIF). This project requires thoroughly detailing those successful procedures developed through experience at allied bases and on bases captured during the war. The new Eagle Flag exercise shows that the Air Force is serious about this type of learning. During OIF, I had the unique opportunity to participate in planning, building, and fighting from two deployed locations: Al Jaber Air Base (AB), Kuwait, as the vice-commander of an air expeditionary wing (AEW) and Tallil AB, Iraq, as the Air Force commander. This article identifies ways to improve current Air Force instructions (AFI) on base assessment and planning. My recommendations are based on a model that I found very useful, and this article will discuss how I applied it to the situations at Al Jaber and Tallil. I am optimistic that if it is fully understood, the Air Force will adopt it or a similar model to further standardize bare-base operations and assist future bare-base commanders.

AFI 10-404, *Base Support and Expeditionary Site Planning*, provides the Air Force outline for writing a base support plan (BSP). However, from my perspective as a base-level leader on the ground prior to and during OIF, the instruction proved to be inadequate for senior commanders. The content and organization failed to reflect real-world problems and never seemed to bond the various parts of a base that must come together to execute the mission. A BSP should be more than a catalog of physical facts and figures; it should explore the functionality of the various aspects of the base. In its finest form, the BSP needs to be a detailed template of how to *fight the base*—employ the base like a weapons system.

The Model: Dissecting Airpower

An air base is a complex machine that has so many moving parts and interdependent elements that one can easily become overwhelmed by its complexity and mesmerized by only a portion of the operation. To organize my thoughts, I (with much assistance from others) developed a model (fig. 1) to aid in understanding the complexity of how an air base generates airpower and to keep Airmen or commanders from concentrating on only one aspect of that process to the detriment of the whole. This model can help future commanders quickly analyze and set priorities for limited resources, identify gaps, and predict the impact those gaps might have on mission accomplishment. The model had to be kept simple, easy to remember, and re-creatable on a single sheet of paper because complex multipage wiring diagrams generate their own requirements and are not easily created or communicated at remote locations.

The function of any air base is to provide sustained airpower. The three essential "air" components of airpower—air*crew*, air*craft*, and air*field*—form the basis of this model. Each of these components is in turn supported by three elements. As a memory key, the aircrew and aircraft elements begin with a "*p*" to connote the *power* of airpower. The power elements of aircrew are purpose, planning, and procedures. For aircraft the elements are parts; petroleum, oil, and lubricants (POL); and payload. The airfield elements begin with an "*s*" to show that *sustained* airpower begins and ends at airfields. The airfield sustainment elements are surfaces, security, and services. The services are flying-related and include activities like air traffic control (ATC), weather (WX), and base operations but not dining, billeting, or morale, welfare, and recreation (MWR).

In developing this model's structure, I recognized a wing-command-level responsibility for airpower; a group-level responsibility for the air components of aircrew, aircraft, and airfield; and squadron-level responsibilities for the power and sustaining elements of the components. This gave me confidence that the model did have some validity, because it reflected how the Air Force has generally been organized while I have been on active duty. The model seemed incomplete until the fundamental "power" component of people (Airmen) was added as the foundational underpinning. So across the bottom of the model (fig. 2) "people" needs were added in priority order: air, water, food, shelter, hygiene, and recreation.

Support

This dissection of airpower was simple and easy to understand. It reflected a hierarchy similar to the Air Force organizational construct, and I could hand-draw it on a single page and explain it in less than 15 minutes. The model helped me keep "the big picture" of what the air base was there to do and quickly focus on the important intricacies of building or operating an air base. It provided a useful tool to show how an organization or an individual contributed to airpower.

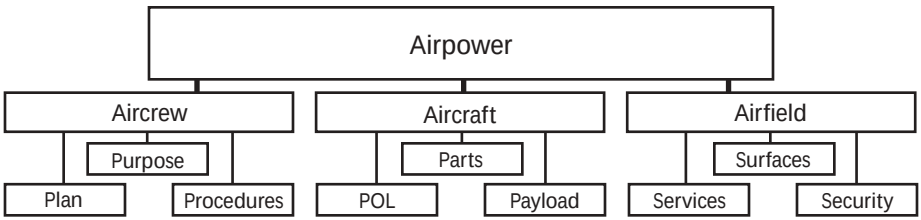

Figure 1. Airpower 101 expeditionary air base model

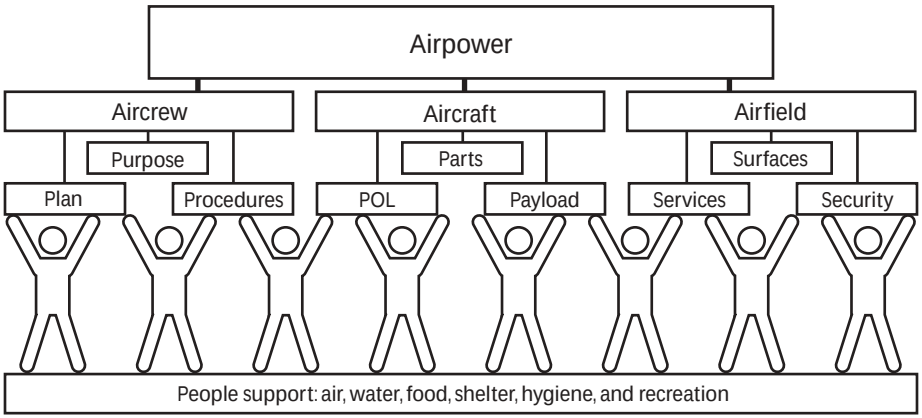

Figure 2. Airpower 101 expeditionary air base model, including people

Applying the Model at Al Jaber Air Base, Kuwait

Over the years, commanders did an excellent job building up Al Jaber AB to accomplish the Operation Southern Watch (OSW) airpower mission. However, OIF highlighted some limitations in expanding airpower operations at that location beyond the OSW level. If the United States and other coalition members were going to execute intense combat operations against Iraq, geography and politics established Al Jaber AB as critical to those operations. This became evident as Al Jaber AB eventually housed the majority of combat search and rescue (CSAR) assets and more fighters than any other base in the theater. It also served as the primary divert base for southern Iraq and Gulf-based fighter aircraft. I would like to believe that some of the success the 332d AEW and Al Jaber AB enjoyed during OIF was due to use of this model in planning for expanded operations.

The model was born out of necessity. Between August and December 2002, the 332d transitioned from an air expeditionary group (AEG) to an AEW and then converted to the new Air Force combat-wing organizational structure, which included a maintenance group. Simultaneously, the new 332d AEW saw its OSW tasking increase in intensity and duration, while it hosted base operational support for US Marine Corps planning and US Navy Seabee construction projects. These operations gave a fairly broad span of control at Al Jaber AB for the newly transitioned AEW commander, who oversaw 13 squadrons with little group-level supervision or assistance until late December. The Air Force reorganization from logistics groups to maintenance groups also created several leadership gaps in the newly formed squadrons. Al Jaber AB had 24 permanent-party personnel while other personnel rotated in for the standard 90-day air expeditionary force (AEF) cycle that further complicated the reorganization and hurt continuity. We could not afford to waste time or resources doing anything twice; therefore, the model helped as both a readiness-assessment tool and as a construct for planning expanded operations.

As a simple readiness tool at the base level, I could get a quick snapshot of each of the nine elements that support airpower and the different people areas. I could then better articulate my areas of concern to the wing commander. As an example, the aircrew component was getting a lot of attention when I arrived at Al Jaber AB. The combined air operations center (CAOC) was still smarting from the Tarnak Farms incident in Afghanistan, during which US Air Force F-16s, thinking

they were taking ground fire, dropped ordnance on Canadian forces practicing on a small-arms training range. After this incident, every OSW mission had extensive briefing requirements that were e-mailed and used in aircrew briefings to ensure that aircrews knew their purpose and that CAOC leadership was comfortable with the planning.[1] Due to the small number of aircraft involved in OSW missions at the time and the fidelity of the air picture, CAOC leadership could maintain detailed information on individual mission procedures. This scrutiny found and corrected any deviations from the purpose, approved plan, and standard procedures.

From my assessment, the aircraft component was equally well positioned for OSW in regards to parts and mission-capable (MC) rates. OSW was manned to blunt an Iraqi attack, but the sanction-enforcement mission meant flying at a much lower sortie rate. Because OSW was a long-term contingency action, supply lines and maintenance operations were well established and perfected over several years—aircraft normally had better MC rates when forward deployed than at home station. POL, on the other hand, needed to be expanded. Leaders above the wing level recognized the need to deliver more fuel and construct more storage at Al Jaber AB, but we needed to work on methods to get the fuel from storage to the aircraft. The payload element needed some work, and we increased the size of the munitions storage area over fivefold to meet OIF requirements.

By using the model, we detected some problems with the airfield component. The Kuwaitis ran the airfield well, but like all military facilities, the airfield could always use some improvements. Surfaces (ramps, taxiways, and runways) were adequate for OSW but were cramped during Operation Enduring Freedom and needed ongoing maintenance to alleviate foreign-object-damage concerns. The Marines assisted in expanding the surfaces by having Navy Seabees construct a new concrete ramp for their operations, and I used the model to first frame and then sell the Air Force on the construction of two new contingency asphalt ramps and a taxiway. Despite that, the ramps' inadequate size and the positioning of facilities forced the wing to accept an increased risk associated with the storage and loading of weapons, which necessitated an application for multiple munitions-quantity-distance waivers. Although adequate for OSW operations, airfield services (ATC, base ops, WX) were not what we would have liked. For example, expeditionary lighting, even after all this time, was still being used for the inside runway and taxiway. The Kuwaiti and US forces had plans to fix all these things—eventually. However, since OSW requirements and Kuwaiti operational requirements were adequately if not perfectly met, these requirements remained below the resource cutoff line, and available assets were committed to other, more pressing, problems. Resources were reprioritized when OIF became a more likely possibility. The security element was a bit more troublesome. The bombings of the Khobar Towers, the African embassies, and the attacks on the USS *Cole* made security a daunting task. Our desire was to meet every possible terrorist threat in addition to the more conventional missile and aircraft threats. Instead, we were often left with impossible security problems, resulting from long-term infrastructure decisions made years before any of these events occurred. Only starting over could fix many of these problems, and that was usually impractical, fiscally impossible, or politically unthinkable. More often than not, we tried to make the best of the situation by attempting to mitigate the potential risks identified during the many inspections and security surveys.

The model worked beautifully as an assessment tool, because in only one page it encapsulated in a logical and easy-to-remember way the entire operation of an air base. It helped me to quickly pinpoint the weak spots that needed work and the strong areas that only required monitoring. It was a Rosetta stone that I would continually go back to when multiple issues from disparate groups clamored for priority.

As an assessment tool, the model helped me identify things at Al Jaber AB that needed

improvement, but its real strength was revealed while planning for OIF. Early on, I attempted to use the two parts of the BSP as a template for determining what we needed to accomplish at Al Jaber AB to be ready for war. From my viewpoint, the format and organization that AFI 10-404 directs for a BSP proved inadequate for the task at hand. The guidance it provides may work fine from the perspective of being at the bottom and looking up; however, from the top looking down, it appeared very stovepiped, fragmented, and disorganized. For example, to learn how a BSP recommends transporting munitions to an aircraft, I had to look in chapters 7, 8, 22, and 25. Unlike a wing commander, the authors of each of these chapters did not necessarily consider all the limitations that had constrained the authors of other chapters. My initial review of the BSP, which was written by previous 332d AEW members for repelling an Iraqi attack during OSW, revealed that although each process appeared to work on its own, they would not have worked when integrated together to support OIF. We needed a BSP that could fight the base.

On the other hand, the model represents the four things that must come together to create airpower:

1. Getting the aircrews ready
2. Generating the aircraft for combat
3. Setting up an airfield to launch and recover aircraft
4. Providing life support for the Airmen that execute the above

The model divided the three air components into the necessary power and sustaining elements. I wanted each of the resulting nine elements in the BSP to have a value chain that maps the different stages of that element and shows how and where its value is enhanced to become a key part of airpower.[2] For example, I gave my squadron commanders the generic value chain of *source, storage, distribution, buildup, delivery, upload,* and *disposal/reclamation* for them to adjust as necessary and then use to describe the process that generates their specific product or service. It took imagination to equate the information that the aircrews received from the CAOC commander's guidance and air tasking orders (ATO) comprising the *source* of purpose, *stored* in the aircrew's brain, and *uploaded* when they climbed into their cockpits. Likewise intelligence; airspace control orders (ACO); ATOs; WX; and tactics, techniques, and procedures from instructions, manuals, or technical orders began the value chains of planning and procedures that were uploaded when aircrews took their positions. The maintenance value chains that generate aircraft; move, store, and deliver fuel; and store, build up, deliver, and load munitions were often a little easier to visualize. Security used different names in its value chain: deter, detect, defend, and defeat to cover both the physical and procedural aspects of security. Airfield services were further broken down into ATC, base operations, and WX before their value chains were described. The model permitted me to easily assign an office of primary responsibility (OPR) to each of the different sections of the BSP and to see the interrelationships and coordination requirements between the OPR and the other squadrons and functions needed to support the section's planning effort.

Now that the nine elements of the three components of airpower had their generic value chains started, we took particular care of the "people" component of the model—the foundation of airpower—which includes Airmen and the supporting civilians and contractors. Each aspect of the people component had its own value chain. For example, although air is usually abundantly available, I incorporated "air" into the chemical-warfare value chain of the BSP along with the possible requirement to make clean air. The bottled drinking water we used at Al Jaber AB already had a value-chain process and just needed to be expanded to account for our increase in population. Food also needed to be increased. The upload step of that value chain required some creativity to feed (upload) 7,000 people at one meal. Another expansion plan adjusted Al Jaber AB's shelter to accommodate a larger

population. The Marines built their own tent city, and the Air Force stuffed more bodies into the available space. Hygiene planning created the nonpotable (used in toilets and showers) water and trash-collection value chains along with the expeditionary medical support (EMEDS) that included the preventive medicine and acute care necessary for Airmen's health. The rest and recreation value chains considered all established MWR activities, selecting and sizing the appropriate activities and services.

Although the 332d AEW wrote its BSP to match the format contained in AFI 10-404, I judged each aspect of the plan by my model and sent those chapters back to the authors if their plans did not meet the logic and parameters outlined above. The model gave me a quick template to judge the plan and make sure all of its parts were seamlessly dovetailed into a workable plan. While no plan ever survives contact with the enemy, the planning that was accomplished to create that BSP gave us a solid foundation to work with. As the number-two Air Force guy at Al Jaber AB, I used the model to adjust priorities during the base's buildup phase for OIF. It was a more logically coherent construct from which to operate and was more capable of predicting outcomes than if we had worked only under AFI 10-404. I depended on the model, not the AFI 10-404 product, during the buildup and early fight.

Tallil Air Base—Using the Model at a Bare Base

In late March 2003, tankers were in short supply. The apparent onset of stiffening Iraqi resistance and the looming battle for Baghdad made Tallil AB in southern Iraq look like an excellent choice for establishing an A-10 forward operating location (FOL) and a ground-forces logistics center. I deployed via an HH-60 helicopter to Tallil AB at the end March to assume duties as the Air Force group commander, with an imperative to establish A-10 operations. Col A. Ray Myer, USA, beat me there by a few days. He was the Global Airfield Assessment Team (GAAT) chief and had arrived with the Army support forces, following the lead elements of the Army 3d Infantry Division. By the time I arrived, Colonel Myer and his team (which included a combat control team) had completed their airfield survey; opened a runway for night, blackout, engine-running offload (ERO) operations; and were working other airfield issues. A convoy from the 332d AEW at Al Jaber AB arrived during this time frame. It consisted of fuel and fire trucks, a security detail, a very limited aircraft squadron of British engineers with their heavy equipment, and a squadron of security forces from the 820th Special Forces (SF) group with a group command support element. Prior to my arrival, the 332d AEW established a CSAR detachment of HH-60s to operate out of Tallil AB, air-refueling them just prior to landing. US Central Command Air Forces (CENTAF) had forward-deployed communications and logistical representatives to be a direct link with headquarters experts and resource owners to expedite getting the right materials with the right priority moving our way to make Tallil operational sooner.

In March 2003, Tallil AB was an air base in name only. The Iraqis had not flown aircraft out of it since 1991, when we bombed the base during Operation Desert Storm. During OSW the airfield housed Iraqi air defense functions, was in the southern no-fly zone, and had a limited civilian presence. For all of those reasons, buildings on Tallil continued to be attacked by the US forces carrying out sanction-enforcement operations. The runways, taxiways, and ramps had not been maintained, water supplies were brought in by trucks, and a system of portable generators and batteries provided the only available electrical power. Tallil looked like what it was—an airfield the Iraqis had lost to their enemy. However, Tallil AB did have several features to commend it for use by coalition forces: its runways were not cratered; it was located south of the Euphrates River; it was twice as close to Baghdad as was Al Jaber AB; it was along a major supply route from the south; and it was essentially isolated from any significant civilian populations. An

Nasiriyah was seven miles away and on the other side of the river.

To rapidly generate airpower from Tallil, I looked to the model that had served me so well at Al Jaber AB. Again, using it as a quick reference helped me establish the priorities needed to initially establish a refuel and turnaround location for A-10 aircraft, transition that capability into an A-10 FOL, and develop an operating location for airpower. Since Colonel Myer continued to run the airlift and airfield operations, including surfaces and services, I started working with the newly arrived security forces. I initially ignored the aircrew part of the model's aircrew component and relied on Al Jaber AB or in-place command and control to give aircrews the information they needed. I concentrated on the aircraft component, and the model rapidly led me to select POL as my first priority. I was counting on Al Jaber AB to send only fully mission-capable (FMC or Code 1) aircraft that only needed fuel. Early on, we mostly supplied consumables (chaff, flares, and a few reloads of munitions) to top off and turn aircraft that had partially expended their loads.

The POL value chain began with the Army as the source. Army tanker trucks were required to deliver fuel to Tallil AB to be stored in fuel bladders. The Iraqis had been considerate enough to have built and left behind a bermed area that just happened to fit our 50,000-gallon bladder. Thanks to a great NCO, the fuels troops soon had a bladder in position, full, and ready to make Tallil an aircraft-refueling stop. We used the small pumps that we had brought from Al Jaber AB to refill the fuel trucks, which created a functioning, albeit slow, POL value chain. This capability was tested less than two days later when the helicopters used in the rescue of Jessica Lynch were refueled at Tallil AB. Simultaneously, British engineers built fuel-pit berms next to the A-10 parking area to make it easy to accomplish either truck or hot-pit aircraft refueling. Additionally, my fuels troops and the CENTAF logistics representative were working all avenues to get us the bigger pumps that would increase our capability.

While I was running fast to get airpower generated out of Tallil, the model also reminded me that I could not forget the people aspect of the model's Airmen component. Although we had covered our air concerns and were prepared to use the one set of chemical gear that we had brought with us, we needed to establish the other people value chains—water, food, shelter, hygiene and, later, recreation. Initially we used bottled water, meal ready to eat (MRE) rations, and some abandoned Iraqi buildings to supplement our very limited number of tents for shelter. Although the Army was our source for water and food, we were a very small part of its huge sustainment task. An open runway and an attached HH-60 CSAR detachment at Tallil AB gave us the opportunity to move our food and water on the 332d AEW's HC-130 aircraft that were supporting the rotation of CSAR personnel into and out of Tallil. Al Jaber AB was a supplemental, or backup, source for getting these things from the Army, especially bottled water. With this alternate source of water, I was able to avoid the Army's bottled-water rationing, thus avoiding a risky measure. As a stopgap measure, we used old Iraqi facilities as shelter for both work centers and living locations until the Harvest Falcon structures arrived.[3] Hygiene was a daunting task, given the limited amount of water and the many demands for it. Fortunately, the British engineers were innovative, digging slit trenches with their heavy equipment to help create functioning latrines; then, they used their limited plywood to make outhouse supports and seats using tarps for the walls. They also built showers from scrap material, using the existing Iraqi water storage tanks located on the tops of buildings, and drained the showers' wastewater into cisterns as septic tanks. The Brits also developed improvised washing machines using Iraqi kitchen sinks. Our hygiene water had to be delivered by Army trucks from off base where reverse osmosis water purification units (ROWPU) provided the source of support for our personal hygiene requirements for the first month of flight operations. We established an alternate delivery method/value chain, separate from the Army, using HC-130s from Al Jaber

AB to deliver the critical people support—water, food, and other hygiene-related items. British engineering personnel provided a great deal of help during the early buildup of Tallil. This was probably not the preferred solution for bare-base buildup, but since time was of the essence and Harvest Falcon assets were not available, I used all existing means. I still needed to address the preventive and acute medical-care aspect of hygiene. This was a less pressing issue since the Army had already located a combat surgical hospital on Tallil AB. Recreation was not yet a pressing problem since we did not have any free time and were too exhausted for anything other than resting in our make-do shelters. Although we were surviving, our living standard was not yet people-sustainable, and we still had much to do. Hopefully, these examples illustrate the strength of the model and how it was used to determine the order of the people priorities that I communicated to Al Jaber AB with requests for assistance. The fact that we used the model at Al Jaber AB gave us a common reference and assisted us in getting our needed support.

As an organizing construct, the model proved to be my most valuable tool in quickly defining and executing the many concurrent tasks needed to get Tallil AB up and running. It was simple to remember, and easy to use in an expeditionary environment. It also encompassed a logic that permitted me to talk to either higher headquarters about capabilities and requirements or to my newest Airmen about how they personally supported airpower production, using the same diagram for both discussions. I used it to quickly organize my thoughts and explain to others how the whole Tallil effort fit together; yet, for all its power and usefulness, it was still missing something. Standing up Tallil proved to be an onerous task, despite the insight the model provided.

As I considered the plethora of roadblocks that I encountered during the buildup of Tallil, I discovered that there was an additional layer under the model—the background infrastructure grids—that goes unnoticed if present and functioning, but if absent, raises barriers at every turn. The infrastructure that enables every air base includes basic power, water, road, transportation, and communication grids. Tallil's underlying grids were lacking because they were incompatible with our requirements, insufficient to our needs, in such disrepair as to be unreliable, or destroyed earlier in OSW. The imperative to quickly get Tallil AB producing airpower forced me to balance rebuilding infrastructure value chains with building airpower because I did not have the equipment, material, or manpower resources to do both simultaneously. I would also add a fifth infrastructure category called "facilities." Facilities infrastructure was the shelter needed by the work centers and is similar to the shelter people needed, as shown in the model's Airmen component. In the end, the balance of effort that generated airpower the quickest caused resources to be diverted from some people-sustainment efforts to make temporary grids. All of the components came together, and the 407th AEG made airpower happen. However, the Airmen who served at Tallil AB during March and April lived and worked without the normal infrastructure that makes airpower sustainable over the long haul. Still those Airmen were able to produce A-10 combat sorties by 2 April 2003, less than a week after arrival, a testament to how expeditionary the Air Force can be if required by the situation.

Support and Infrastructure Grids

With infrastructure grids added as background to the model (fig. 3), I could then at least articulate the Tallil AB challenges to headquarters and convey to the Tallil Airmen that they were temporarily sacrificing their personal comfort for a greater good and that their patience would eventually be rewarded with better facilities. I believe the model captures all the important aspects of standing up and fighting an expeditionary air base.

Political considerations come into play, especially when building up bases in allied countries, and may add extra layers and coordination cycles to the decision-making process as a commander develops all the value chains that

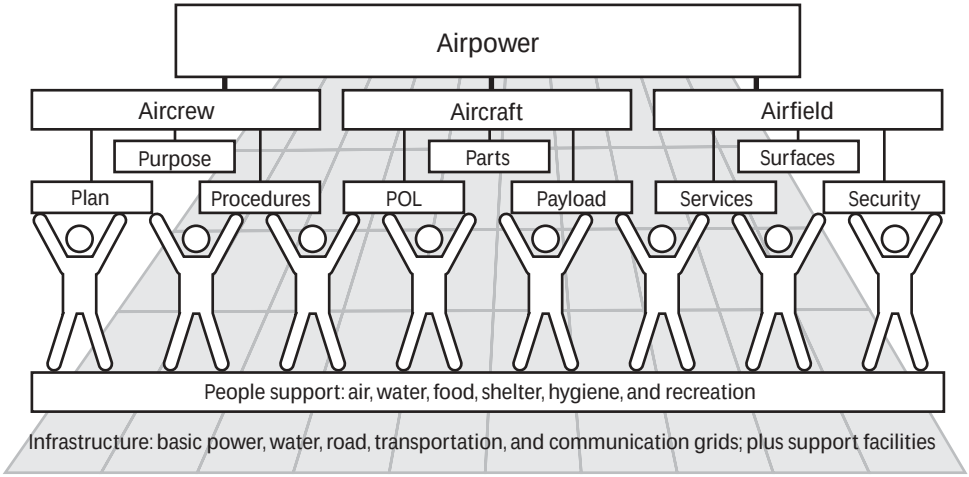

Figure 3. Airpower 101 expeditionary air base model, including people

are necessary to function. While these political aspects do not affect the fundamentals of the model, their ramifications often become a primary influence on how the value chains operate and are always a starting point in understanding what is permissible in another country.

Eventually, the bare-base Harvest Falcon assets caught up with the pace of personnel deployments to Tallil AB; then, water, power, and facility infrastructures were constructed to support both airpower and people requirements. Communications infrastructure leveraged the existing Iraqi conduits; together they produced a functional grid on base—at least for work-center phones and computers and connected to long-haul grids to get us off base. Existing roads began to be repaired and additional roads constructed. Each of the nine elements of the three airpower components continued to develop even more capable and functional value chains. The base could now fully support airpower operations: close air support, strike, air mobility, rescue, and reconnaissance operations. In addition, Tallil provided base-operating support to other coalition members so they could build their airpower capabilities without having to endure the deprivation we encountered. I knew that Tallil AB had crested the infrastructure hill when, just prior to my departure in July, I flushed the first standard toilet that had been installed in a new hard-sided building using Air Force–produced and piped-in water—pretty good for just three and one-half months on a decimated enemy air base.

Topics for Further Consideration

This model closely matches a base's organizational construct and can be used as the centerpiece for base support and operations planning and as a yardstick for evaluating the execution of those plans. I recommend that Headquarters Air Force (AF/ILX) rewrite AFI 10-404 using this model to standardize the language of assessing, building, and fighting an air base. It provides the organizational construct on how to write a base plan. I further recommend that a section be devoted to the components of "aircrew," "aircraft," "airfield," and "Airmen." Within those sections, chapters could be devoted to the value chains described herein for each of the nine airpower-element areas and the additional areas that support people and infrastructure grids. We should expand the instruction to include three different levels of planning: the current Expeditionary Site Plan (ESP), the survey of

infrastructure; a BSP that includes detailed planning of what needs to occur to make the air base functional as listed in an operation plan (OPLAN); and a more robust Base Operating Plan (BOP) that includes all the element value chains. The BOP would be at the top of base planning and give commanders a better idea of how to fight the base. These plans, written by the wings that will likely execute them, become the basis for exercises and inspections. By planning and training with the Airpower 101 model at home, its use becomes second nature in the way we think of fighting. Even if that wing deploys to a different location, that model and the wing's experience in exercising it will still provide the framework for making the new location operational. The model could become a logical and unifying construct for all bare-base operations—that links airpower-process components, elements, and value chains to an organizational hierarchy (wing = airpower; group = airpower components; squadron = airpower elements; and flights = steps in value chains), providing a common language to all levels of command that are involved in standing up bare bases.

The model may have uses beyond bare-base setup. Consideration could be given to using it as a departure point to more closely aligning wing organizations along the lines of the model, with separate groups having responsibility for aircrew, aircraft, and airfield components and squadrons within those groups having responsibility for the elements described under each component. This would put group commanders in charge of all the value chains for a particular component, requiring that fewer command lines be crossed. For example, if an airfield runway is currently closed, the wing commander must go to either the Mission Support Group or Operations Group to find out why. Likewise, weight management has both Medical Group and Mission Support Group aspects, which force policy decisions up to the wing commander when a new Airmen Group could have complete oversight. There will always be pluses and minuses to any way we organize; however, if the generation of airpower has a logical construct, then a more functional organization might logically follow that construct.

The Airpower 101 model served me well during an intense period at Al Jaber and Tallil Air Bases, when the mission was critical and time and resources were limited. I offer it now to those who may find themselves in a similar situation in the future, with the hope that it may keep them from having to relearn those lessons while under fire. □

Notes

1. "Summary of Facts" (MacDill AFB, FL: Headquarters United States Central Command, 14 June 2002), http://www.centcom.mil/CENTCOMNews/Reports/Tarnak_Farms_Report.htm.

2. Michael Porter, *Competitive Advantage: Creating and Sustaining Performance* (New York: Free Press, June 1998). Developed by Michael Porter, the value-chain framework is a model that is used to help analyze specific activities through which firms can create value and competitive advantage.

3. Harvest Falcon is the Air Force's transportable system of modular personnel tents, shelters, equipment, and vehicles that is used when there are infrastructure limitations. The Harvest Falcon equipment was specifically designed for use in Southwest Asia and is sized as a 1,100-person housekeeping set of tents, electrical generators, and billets.

Revised USAF Doctrine Pub

AFDD 2-4.1, *Force Protection*

DR. JOHN REESE

JOINT PUBLICATION 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (as amended through 9 June 2004), defines force protection as

> actions taken to prevent or mitigate hostile actions against Department of Defense personnel (to include family members), resources, facilities, and critical information. These actions conserve the force's fighting potential so it can be applied at the decisive time and place and incorporate the coordinated and synchronized offensive and defensive measures to enable the effective employment of the joint force while degrading opportunities for the enemy. Force protection does not include actions to defeat the enemy or protect against accidents, weather, or disease. (p. 207)

The draft version of Air Force Doctrine Document (AFDD) 2-4.1, *Force Protection* (as of 11 May 2004), focuses this definition for Airmen by calling force protection "an integrated application of offensive and defensive actions that deter, detect, preempt, mitigate, or negate threats against Air Force air and space operations and assets, based on an acceptable level of risk" (p. vi; all references to AFDD 2-4.1 come from this version of the document). Although Airmen have always regarded force protection as essential to the mission, the events of the last decade—the bombing of the Khobar Towers housing complex on 25 June 1996 in Dhahran, Saudi Arabia, and the terrorist attacks of 11 September 2001 are the most striking examples—have underscored its importance.

According to AFDD 1, *Air Force Basic Doctrine*, 17 November 2003, force protection doctrine for the Air Force flows from the proposition that "air and space power is most vulnerable on the ground" (p. 25). Today's Airman confronts a new enemy who fights by a different set of rules and seeks an asymmetric advantage over a technologically superior foe, as Maj David P. Briar reminds us in the following article. An enemy will try to exploit this advantage to deny access to our air and space expeditionary task forces. Failing this effort, he will attempt to delay, disrupt, or otherwise degrade air and space operations. Consequently, in addition to the familiar kinetic and nuclear, biological, and chemical threats of the Cold War era, Airmen must be prepared to defeat a new array of chemical, biological, radiological, enhanced-explosive, environmental, informational, psychological, and electronic threats. Air Force doctrine and practice are moving beyond their traditional emphasis on law enforcement, physical security, and ground defense of air bases to meet these challenges.

Although AFDD 2-4.1 notes that "force protection is both an individual and [a] command responsibility" (p. 2), commanders at all levels have a special obligation to balance force protection and operational mission requirements. Operational risk management—sound intelligence, realistic threat assessment, and careful risk analysis—is the foundation for this balancing act. Moreover, force protection is one arena in which "small-scale [enemy] operations" (AFDD 2-4.1, p. 15) can have disproportionate operational, psychological, or other effects. For this reason, force protection is very much effects-based, and AFDD 2-4.1 insists that planning be based on an appreciation of the long-term "effects intended to be produced by the threat, not just the nature of the threat itself" (p. 15). The result of this planning—integrated base defense—is the Air Force concept for embedding force protection capabilities within a "well-defined, networked command and control architecture," as described by AFDD 2-4.1 (p. 30). The goal remains freedom of action for air and space forces.

To Learn More . . .

Air Force Doctrine Document (AFDD) 2-4.1. *Force Protection*, 29 October 1999. https://www.doctrine.af.mil/Main.asp?
AFDD 2-4.1. *Force Protection*. Draft, 11 May 2004. https://www.doctrine.af.mil/Main.asp?
Joint Publication 3-10. *Joint Doctrine for Rear Area Operations*, 28 May 1996. http://www.dtic.mil/doctrine/jel/new_pubs/jp3_10.pdf.
Joint Publication 3-10.1. *Joint Tactics, Techniques, and Procedures for Base Defense*, 23 July 1996. http://www.dtic.mil/doctrine/jel/new_pubs/jp3_10_1.pdf.
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Sharpening the Eagle's Talons

Assessing Air Base Defense

MAJ DAVID P. BRIAR, USAF

Editorial Abstract: The Air Force has invested little in securing an air base beyond the maximum effective range of security forces' heavy-weapons teams that operate inside the base's legal perimeter. Thus, a gap exists from which our adversaries can launch standoff attacks with little fear of reprisal. This article reviews the history of such attacks and makes recommendations in the areas of organizational structure and manpower for dealing with future threats to our air bases.

WRITING ABOUT ALLIED convoys sailing the cold, wind-swept seas of the Central Atlantic during World War II, Williamson Murray and Allan Millett note that "the crews' biggest worry was the large gap . . . where Allied air cover could not reach."[1] The German navy quickly exploited that gap, sinking many a vessel there. Even though the Allies could have shrunk or eliminated the gap by using long-range aircraft such as the B-24, they decided against using these bombers in an antisubmarine role, thus giving the Germans a fleeting chance to "crush the Allied convoy system."[2] That decision cost many lives and much treasure.

Just as the Allies left the door open for Adm Karl Dönitz's U-boats, so has the Air Force left a gap outside our air bases that its security forces, for the most part, cannot reach. Even though the service has taken great pains to develop a coherent base-defense doctrine, the latter considers the security forces capable of controlling only those areas out to the maximum effective range of the heaviest weapons system available to the defense force commander. According to Air Force doctrine, security forces should consider threats emanating from sources outside that range but let other forces, such as those of the host nation or sister services, handle them. Even though this door is not as wide open as the one in the

Central Atlantic during World War II, the Air Force needs to review its doctrine and organizational structure carefully to insure that it can meet future threats.

To that end, this article examines the postulated threat to air bases, especially those outside the continental United States (CONUS), and the adequacy of the service's force-protection and base-defense doctrines in order to determine what the Air Force needs to do to resolve the problem. In order to make such a review viable, the article makes certain assumptions. First, it considers only a narrow range of potential threats against air bases—specifically, attacks from surface-bound adversaries using mortars, bombs, rockets or rocket-propelled grenades, surface-to-air missiles (SAM), or long-range rifles. It does not consider operational-level threats such as theater ballistic missiles or nuclear weapons. Second, the article considers threats according to the manner in which they would attack an installation as opposed to the size of the adversary or the force dispatched to deal with the threat. Third, because the article deals with existing doctrine and the operational practice of force protection and base defense, many topics—such as physical security, sensors, and technology—remain outside its scope. Finally, this article leaves the reader with some open-ended questions, such as how we should go about finding the resources necessary for change.

The Threat to Air Bases

On 1 November 1964, the Vietcong attacked Bien Hoa Air Base, South Vietnam, with 81 mm mortars, killing four people, destroying 20 aircraft, and marking the beginning of a campaign by the Vietcong and North Vietnamese army that would include over 400 additional attacks, claim many more lives, and destroy valuable resources.[3] The attack on Bien Hoa sent a message that air bases are vulnerable to attack and that a fairly unsophisticated enemy could disrupt air operations for at least a short time and inflict substantial casualties. Without acknowledging such lessons from our military history and their implications for the future, we cannot evaluate the adequacy of current security-forces doctrine. Furthermore, attacks such as those on the Pentagon and World Trade Center on 11 September 2001 should prompt the Air Force to question whether its doctrine meets the needs of a world in which enemies use asymmetric means of attack. Finally, history gives us the starting point for all our doctrine, allowing us to determine past trends, extrapolate them in some imperfect fashion, and decide what the future may hold.

Regarding the environment in which US forces are likely to find themselves, Dennis Drew comments that "insurgencies, protracted revolutionary warfare in the underdeveloped and developing world, appear to be the most likely, if not the most threatening, kinds of conflict the US will face in the future."[4] Additionally, Air Force Doctrine Document (AFDD) 2-4.1, *Force Protection*, asserts that "the post–Cold War period is characterized by a significant shift in the Air Force functions and an increased exposure of its resources to the worldwide enemy threat. Today, potential opponents are more unpredictable, and US assets are more at risk to enemy attack. Additionally, there is an increase in the availability of high and low technology weapons and weapons of mass destruction (WMD). US aerospace power requires protection from these threats at home station and abroad."[5]

Recent experience lends credibility to these ideas. US involvement in Afghanistan calls to mind many aspects of insurgent warfare, including establishing relations with former warlords, protecting a newly established government, and conducting search-and-destroy missions from fixed bases. In Iraq the US military once again finds itself fighting insurgents and revolutionaries.

In their book *Check Six Begins on the Ground*, David Shlapak and Alan Vick claim that "the most likely threat facing USAF bases in the future will likely resemble those presented by . . . the [Vietcong]/[North Vietnamese army] in Vietnam."[6] The chief problem for the Air Force in facing a Vietnam-type threat is the manner in which those forces tend to

conduct operations. According to Vick's book *Snakes in the Eagle's Nest*, "96 percent of the attacks [in Vietnam] . . . used standoff weapons rather than attempting to penetrate defenses."[7] The weapons of choice for the Vietcong/North Vietnamese army were rockets and mortars. These attacks, which simply went over perimeter defenses such as machine guns, sentry dogs, and observation posts, represent the classic asymmetric threat that base-defense planners need to consider strongly.

Steven Metz and Douglas Johnson point out that asymmetry is the "use of some sort of difference to gain an advantage over an adversary."[8] That difference has played out on the battlefield over the course of history in many ways. Asymmetric attacks are nothing new—witness the kamikaze attacks against Allied ships in World War II and the destruction of the Marines' Beirut compound in 1983, for example. In the same way fire ants use asymmetric capability (e.g., superior mobility and poisonous mandibles) to defend their territory, opponents seek to defeat the United States in a manner and place that avoids US strength and technology. Overall, as the United States prosecutes a campaign to rid the world of threats, the Air Force may face enemy forces that use asymmetric tactics and methods such as standoff attack as a means of avoiding a conventional engagement with the service's technologically superior security forces.

Experts tend to agree with this assessment. Clifton Dickey, for one, argues that "future adversaries of the United States will likely employ some type of asymmetric strategy to defeat or lessen the effectiveness of the United States Air Force's [air and space expeditionary force] (AEF)."[9] He makes a case for the effectiveness of asymmetric, standoff attack in his account of the 1968 Tet offensive:

> On the night of 29 January 1968, the US realized the seriousness of its air base vulnerability with the beginning of the TET offensive. On the first night, enemy forces mounted forty-four attacks against friendly air bases with forty-one classified as standoff attacks. The standoff attacks relied on crude rockets, 81mm mortars, and recoilless rifles while managing to destroy 13 aircraft and leaving 40 others with major damage. When the TET offensive finally ended on 31 March 1968, the [North Vietnamese army]/[Vietcong] had attacked 23 US and [Republic of Vietnam] airfields, 36 provincial capitals, and numerous hamlets but lost the offensive at a cost of over 45,000 casualties.[10]

Institutionally, the Air Force recognizes the significance of the asymmetric threat. Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program*, has this to say about the threat to air bases: "Asymmetric threats will increasingly challenge base defense forces. Historically, elements such as special forces, light infantry, airborne, airmobile, terrorist, guerrilla, and irregular units have successfully employed unconventional warfare tactics to harass personnel and destroy vital resources."[11] The word *unconventional* implies that adversaries will not likely charge headlong into a perimeter of infrared sensors, military working dogs, and manned fighting positions but will seek to disrupt Air Force operations by employing tactics that avoid formidable defenses. Consequently, standoff attacks—because they are least likely to encounter Air Force strength—represent the wave of the future in terms of asymmetric warfare.

Even the strike against the Khobar Towers housing complex in Dhahran, Saudi Arabia, in 1996 qualifies as a standoff attack since the perpetrator never entered the legal limit of the installation, yet killed 19 Airmen. Moreover, al-Qaeda and the Taliban employ standoff rocket and mortar attacks in Afghanistan, as attested by Maj David Young, a security forces officer on the ground at Kandahar Air Base from December 2001 to March 2002, who reported four rocket attacks on the base. According to Young, the attacks were not effective but typify the enemy's attempt to find and expose gaps in base defenses.[12]

Doctrinal Overview

To determine whether Air Force security forces are capable of defending against the threat of attacks on air bases, one must move down the doctrinal ladder from basic air and space doctrine, through combat-support and

force-protection doctrine, to base-defense doctrine. By doing so, one will discover not only the doctrinal and physical gaps, but also some other minor flaws in Air Force doctrine. The latter concern the difference between force-protection and base-defense doctrines. Even though it is fairly clear that base-defense activities designed to counter kinetic, ground-based threats are a subset of the wider group of force-protection operations, some Air Force documents confuse this point. According to AFDD 1, *Air Force Basic Doctrine*,

> air and space power is most vulnerable on the ground. Thus, force protection is an integral part of air and space power employments. Fixed bases are especially vulnerable as they not only must withstand aerial and ground attacks, but also must sustain concentrated and prolonged air activities against the enemy. This must be a particular focus of operations during peace support or crisis situations, when forces may operate from austere and unimproved locations, in small units, or in crowded urban settings and face threats to security from individuals and groups as well as possible military or paramilitary units.[13]

Air base defense, then, is a key element of all Air Force operations. The service considers base defense a part of its overall force-protection program—a combat-support function. AFDD 2-4, *Combat Support*, documents the importance of force protection and the doctrinal submission of base defense as a function of force protection:

> Force protection provides the safe and secure operational environment necessary to ensure mission completion. It plays a part in every Air Force operation, from conducting surveillance against threats, *to furnishing air base defense*, protecting against health threats, providing community safety, and protecting communication and information systems. Everyone is responsible for force protection. Every airman should be trained in force protection knowledge, concepts, and weapons skills; self-aid and buddy care; field hygiene; [nuclear, biological, and chemical] defense measures; and antiterrorism and threat awareness. The prime goal is to execute the mission with increased freedom and reduced fear.[14] (emphasis added)

AFDD 2-4 further notes that security forces provide "forces for air base defense, security, and law enforcement services [and] protection to weapons systems, personnel, and infrastructure."[15] Also regarding the role of security forces in force protection, Air Force Policy Directive (AFPD) 31-3, *Air Base Defense*, states that "an effective defensive posture must be established to allow generation, launch and sustainment of aerospace operations. In these situations, air base defense forces *provide force protection* . . . for warfighting assets" (emphasis added).[16] The minor flaw with this definition is that it essentially makes force protection a function of security forces. In fact, the Air Force views force protection and the role of security forces more broadly. For example, according to AFI 31-301, *Air Base Defense*, "activities that [air base defense] forces could reasonably expect to conduct include, but are not limited to, physical security, law enforcement . . . and force protection. Force protection encompasses everything US forces do to protect personnel, resources and property, and is not just the sole responsibility of security forces."[17]

In spite of these issues, Air Force doctrine clearly defines air base defense as "actions taken by force protection forces in theater preparing for an overt attack by level I, II, or III threats. Forces should be organized to prevent and defeat attacks."[18] Basically, security-force planners assume that overt attack means an adversary will use kinetic, ground-based means to attack the air base directly or indirectly. Air Force doctrine for base defense boils down to putting bodies, weapons, sensors, and fires in the right place at the right time. Force protection, in Air Force terms, describes the overall process of protecting people and resources, of which the service considers base defense only one part.

Doctrine for Air Base Defense

The Air Force has made great strides in documenting base-defense doctrine. AFPD 31-3 provides the foundation:

> The Air Force will provide in-place and deployable air base defense forces who are organized, trained, and equipped to undertake force protection missions in accordance with the Air Force [Wartime Mobilization Plan]. During periods of low- or mid-level threat (Level I or II), air base defense forces are primarily responsible for protecting the force from attackers attempting close attack by penetrating forces and from stand-off attack within the TAOR [tactical area of responsibility]. The TAOR is the area which the defense force commander can control through organic heavy/light weapons fire. The Air Force component will ensure adequate support is available from the other joint components, host nation, coalition, allied forces, and civilian authorities to meet surveillance and denial needs, *such as for the standoff threat beyond the capabilities of the Air Force*. During periods of high-level threat (Level III), air base defense forces rely on a tactical combat force (TCF) comprised of other US service components, allied, coalition or host-nation forces to ensure the survivability of air bases. Outside the air base TAOR, U.S. Army, U.S. Marine Corps, host-nation military forces or civilian security/law enforcement agencies will have responsibility for security requirements.[19] (emphasis added)

The key to understanding this section and the doctrine of air base defense lies in the definition of TAOR. Essentially, the Air Force considers its security forces capable of defeating only the standoff threats they can put fire on. Moreover, the service assumes that another friendly force *will* maintain responsibility for areas outside the TAOR. As a result, the TAOR is determined not by the needs of the installation or the threat to it but by the maximum effective range of the heaviest weapon available to the defense force commander. Two issues spring from this doctrinal line in the sand.

First, if security forces just handle threats within the TAOR, then our bases are exposed to increased risk because enemy forces simply need only move beyond the range of our organic weapons to attack us. This risk and the possibility that the enemy will find that safe spot from which to operate constitute the aforementioned gap in base-defense doctrine. Even though this doctrine states that we will enlist host-nation or other forces to counter the threat outside the range of security-force weapons, that position is fraught with danger. For example, denying the area from which an adversary can employ SAMs against US aircraft requires a significant and persistent commitment of manpower. If the friendly forces tasked with providing that commitment are diverted for some other purpose, then the Air Force will face great risks. Conversely, if the Air Force has heavy weapons on par with those that opposing forces can bring to bear, then it can realize some measure of balance. Weapons such as the M-24 sniper rifle and Mk-19 grenade launcher give the Air Force greater capability to increase the size of the TAOR but don't sufficiently address SAMs, which do not attack an air base directly but rely on stealth and concealment to move inside an unprotected SAM footprint.

Second, this doctrine falls short of the defense force commander's mission. We find in AFI 31-301 that "the [defense force commander] organizes forces to defeat level I threats, disrupt or delay level II threats and delay level III threats."[20] Arguably, in order to do that, the commander must have forces capable of moving beyond the TAOR in order to deny territory to enemy forces threatening to attack with standoff weapons. Moreover, joint doctrine suggests that defense forces take this action. According to Joint Publication (JP) 3-10.1, *Joint Tactics, Techniques, and Procedures for Base Defense*, "an early priority in the base defense plan may be to establish patrols outside the perimeter."[21] The Air Force primarily plans to do that with the assistance of host-nation or sister-service forces. In sum, doctrinal restriction of security forces inside the TAOR and reliance on friendly forces for controlling the terrain beyond the TAOR come with risks that the Air Force may not be prepared to handle. Joint doctrine sheds some light on why the service chose to accept this risk.

According to JP 3-10.1, the combatant commander must insure that bases are adequately protected.[22] Presumably, this means the commander will provide the necessary forces to meet any threat to air bases. However, two problems arise. First, a cursory review of JP 3-10.1 reveals that it applies to a linear, contiguous battlefield. For example, it talks about

establishing rear areas, base clusters, control centers, and other control measures designed to share the burden of base defense.[23] However, US armed forces are rapidly moving away from this construct, as illustrated so well in the recent invasion of Iraq. The implication is that the Air Force likely will be left on its own to secure a remote yet vital airfield.[24] Second, these joint tactics, techniques, and procedures assume that security forces assigned to a given base can defeat a level-one threat. Given that a single terrorist or sympathizer might use a standoff weapon from outside the TAOR of that security force, such an assumption may not be valid.

Air Force Resources for Air Base Defense

In the best-case scenario, these problems become moot. However, warfare is rarely so simple. Consider a conflict in which the combatant commander tasks the air component commander with protecting the air bases. What forces does the Air Force have to accomplish this mission?

The venerable 820th Security Forces Group's three squadrons could quickly be tapped out supporting steady-state AEF missions. Other provisional security-forces units are the sum of subunits, also known as shreds, organized under the AEF model out of fixed-base units in the CONUS and overseas. These shreds leave their home units behind, minimally manned to meet the mission demands of the post-9/11 environment. The bottom line is that the Air Force's security forces are spread so thin over CONUS and overseas missions that they risk protecting nothing by trying to protect everything. This is not to say that each air base outside the CONUS needs 1,000 security forces and mounted patrols 20 kilometers from the base. It is to say that today we have—and will likely have in the next war—aircraft deployed so far forward that our security forces will have to patrol the standoff footprint because other friendly forces simply will not be available to conduct these operations. Thus, security forces need the organization and training to conduct these operations successfully.

AFDD 2-4 states succinctly that "the basic foundation of combat support is a motivated and ready force tailored, organized, trained, and equipped to accomplish tasks. Combat support leaders should always be looking for ways to optimize their forces to more effectively and efficiently support the warfighter."[25] Arguably, the current structure, mission set, and daily requirements of the security forces do not allow them to become all that this doctrine document envisions, a situation which has implications for the standoff threat.

Significantly, AFDD 2-4.1 ranks standoff attacks—emanating "from outside, sometimes far outside, a base perimeter"—first on its list of threats. It also acknowledges that they have been the most frequent attacks to occur since World War II and are "difficult to counter."[26] Similarly, according to AFI 31-301, "the standoff attack is more difficult to detect and defeat. . . . [It is] the most likely threat to Air Force personnel and resources."[27] If everyone from Santa Monica to Washington, DC, agrees that this is the most likely threat, then we must ask whether the security forces' organization is capable of handling it.

The image of an eagle—talons extended, poised over an airfield, ready to strike—emblazoned on the security-forces beret is also a metaphor for our security forces in action around the world, denying enemies the chance to affect the Air Force's air operations. However, most members of provisional security-force squadrons do not receive the level of training required to move beyond a perimeter-based defense. Conversely, the formation of units like the 820th Security Forces Group and the 86th Contingency Response Group is a positive sign that the Air Force is transforming to meet its needs on the modern battlefield.

Writing about the 820th, a truly expeditionary unit in an expeditionary air and space force, Herbert Brown declares, "With the capability to deploy within 24 hours of notification, the USAF has finally established a viable solution to the age-old problem of protecting our deployed assets."[28] Arguably, his view of

this group as a panacea is premature. Brown does not account for the vast number of steady-state deployments levied on the 820th, nor does he mention the number of forces required over the last few years as the United States went to war in Afghanistan and Iraq. But he is on target in his assessment of how we should organize and train security forces. Operations in support of the global war on terrorism further illustrate this point.

When the 822d Security Forces Squadron deployed to Ganci Air Base, Kyrgyzstan, unit leadership established patrols—both mounted and dismounted—off the installation to secure the SAM footprint.[29] What makes this patrolling important is the training required to do it well. Lt Col Donald T. R. Deery, commander of the 822d, commented about the deployment to Kyrgyzstan: "Our unit does nothing but train and deploy to contingency operations."[30] In other words, the squadrons in the 820th Security Forces Group train the way they fight. More recently, members of the 86th Contingency Response Group launched mounted patrols outside the installation perimeter in Bashur, Iraq, in order to limit the possibility of standoff attack.[31] Overall, only a handful of units in the security forces possesses the training and organization to move beyond the confines of Air Force doctrine.

However, several issues remain. For one, the 820th and other units simply cannot keep pace with the demand for their services. Furthermore, in many cases the Air Force lacks operational control of forces assigned to patrol the area of greatest threat. Also, with regard to a nonlinear, noncontiguous battlefield, joint doctrine is not specific about who bears responsibility for this area. In fact, the definition of the TAOR is found only in Air Force publications. Finally, the overall organization of provisional security-forces squadrons puts the Air Force in such a position that security forces do not train the way they fight.

The chief risk of the current approach to building provisional squadrons by forming a squadron from the sum of numerous elements is that, if faced with a combat situation, the squadron may not perform optimally because, arguably, it is not really a unit but a composite of several different units. Certainly, good leadership, a positive climate, military discipline, and a common mission serve to bond units together. For example, in the late 1990s the Air Force realized that sending individual replacements to Southwest Asia was a bad practice. Overall, the change by Air Combat Command requiring at least a 13-person squad to deploy to Southwest Asia was a great initiative. However, when a unit consists of 10 such squads as well as other larger and smaller elements, all from different bases, gaps are likely to form in its unity and cohesiveness. Moreover, because provisional squadrons formed on the AEF shred concept are unevenly trained, deployed squadron commanders and operations staffs risk spending their time on integrating new shreds every 90 or 120 days rather than on the tough business of force protection.

Another salient point that bears directly on current base-defense doctrine is the role of Air Force personnel who are not in the security forces. In its discussion of survivability, AFDD 2-4 states that "at a minimum, successful air base defense requires basic weapons and tactics training for all deployed Air Force personnel."[32] It seems that the Air Force is placing its future not in a large, dedicated organization of security forces but in each and every Airman assigned to the expeditionary wing. This point raises questions about the level of risk the Air Force is willing to accept and whether or not that risk assessment is appropriate in today's operating environment.

Recommendations

The Air Force is an expeditionary service, so its security forces should be equally expeditionary. Making them so will require a new mind-set, increased risk, and reorganization. The new mind-set will entail shifting a major portion of these forces from law enforcement, entry control, and administration in the CONUS to new expeditionary units based on the 820th model. This mind-set is new because it requires each installation to adopt a contract security force to handle those functions that

Air Force security forces need to give up. Although increased risk is inherent in this approach, modifications to Title 10, *Armed Forces*, occasioned by the Defense Appropriations Act of 2003, make such an approach legal. The risk goes beyond this, however, in terms of uneven training, lack of control, and the possible existence of a greater criminal threat on our installations. Nevertheless, radical times call for radical changes. With regard to organization, this particular change is huge.

CONUS security-forces squadrons would relinquish to a contractor such functions as law enforcement, resource protection, crime prevention, administration, personnel and information security, and entry control. Those manpower positions would move to new expeditionary squadrons. Moreover, the old squadrons would retain a core of military manpower under the leadership of competent officers and senior NCOs to perform vital weapons-system security for resources at priority-level three and above. Moving these "bill-paying" positions from conventional to expeditionary squadrons is certainly revolutionary. Other changes are equally radical.

An expeditionary unit needs to focus on training and deploying to fight. For example, when the 23d Fighter Squadron is at home in Spangdahlem, Germany, its members are training to fight for the next war. However, the 52d Security Forces Squadron, also based at Spangdahlem, is trying to squeeze training into a schedule that includes registering cars and making sure that base organizations properly secure their classified documents. The organizational change mentioned above addresses the need to divest these functions and transform security forces into an expeditionary force while leaving only a precious few members behind to provide close-in security and response capability for key war-fighting resources. As a result, as additional groups of security-forces squadrons form, they can focus on training in the way the Air Force now fights—as part of an air and space expeditionary task force. Organization and training are not the only changes that have to be made. Air Force leaders must change their minds about what risks they are willing to take.

In a sense, Air Force leadership has already answered the question about its willingness to accept risk. As forces began to deploy in support of Operation Iraqi Freedom and the Air Force confronted the need to send security-forces reservists home, the Air Force and Army National Guard agreed to mobilize thousands of soldiers to augment security forces at CONUS installations. This approach, although short term, carries with it operational risks, even though good leadership from competent NCOs and officers mitigates those risks. Furthermore, the Resource Augmentation Duty (READY) program provides another example of leadership's willingness to accept risk to provide security for air bases. Overall, the practice of accepting moderate risks to put forces where we need them most has occurred for years. Some people may believe that the hiring of contractors to perform entry control, basic law enforcement, and administration functions represents a radical change, but it is really not that different from current practice.

As for resources, many are already available. Just as manpower moves from traditional squadrons to expeditionary units, the equipment the unit utilized in its former mobility mission can do likewise. However, the Air Staff would have its hands full addressing the following resource issues:

1. Location of the units. Related matters include dorms, housing, ranges, and offices. Moreover, the activities of the Base Realignment and Closure Commission would assure congressional involvement as forces move from state to state.

2. Funding for a large contract security force in the CONUS.

3. Funding for the balance of equipment required, such as weapons and ammunition.

The Air Force should combine AFI 31-101, 31-301, and 10-245 (*Air Force Antiterrorism Standards*) into one comprehensive base-defense doctrine document. We would find ourselves

on much firmer ground with such a document—one that deals comprehensively with threats to air bases, in the CONUS or overseas; eliminates the distinction between threats posed by terrorists and those posed by special forces during a major theater war; and focuses on countering threats based on the capabilities, tactics, or techniques that an enemy could employ to attack our bases.

The threat-level system also needs modification. Talk in the Pentagon these days favors a capability-based force. If the armed forces are moving more toward this model, then it is time to change the threat-level system accordingly. The current system indicates only the size of the threat. However, a level-one threat comprised of men armed with an 81 mm mortar is much more serious than one from the same group armed only with rifles. Additionally, that same level-one threat potentially could do more damage than a level-two threat attempting direct penetration through a tactical automated security system, fighting positions, and well-controlled response forces. The bottom line is that future enemies aren't going to fit into neat packages based on the size or type of element attacking the air base. Conversely, they will possess more easily classified capabilities and should be dealt with accordingly. In other words, if a single terrorist packs enough punch to warrant a response force moving against him, then so be it.

That said, the threat classification system should change as follows:

- Level One: Capable of conducting a direct attack using tactics such as infiltration, improvised explosive devices, or small-arms assault.
- Level Two: Capable of conducting direct and standoff attacks using small arms, mortars, rockets, rocket-propelled grenades, snipers, large-magnitude bombs, and limited biological or chemical agents.
- Level Three: Same threat as levels one and two plus capable of conducting company-sized direct or standoff attacks that would require a response from a mobile combat force with heavy weapons.
- Level Four: Same threat as all or part of levels one through three plus capable of launching theater ballistic missiles with or without chemical or biological agents.

Conclusion

At least superficially, the Air Force learned a lesson from the attack on Bien Hoa Air Base and created doctrine (AFI 31-301) to address its base-defense needs and the requirements of joint doctrine. However, operational practice, force structure, and the AEF construct fight against that doctrine. Chiefly, organic forces are rarely available to installation commanders who need to patrol outside the TAOR. Even though current security-force initiatives like "close precision engagement" or the employment of sensors or unmanned aerial vehicles promise to extend the reach of security forces, the adaptable enemies the United States will face in the future will likely not cooperate by moving inside the maximum effective range of the M-24. Clearly, the Air Force is concerned with the standoff footprint but considers itself largely incapable of denying its use to the enemy, a stance which leaves the service in a real quandary. If Maj Clifton Dickey and Alan Vick are right, the expeditionary air and space force could be in for a world of hurt.[33] In the same way the German U-boat captains found the gap where airborne escorts could not protect Allied shipping during the Battle for the Atlantic, it is only a matter of time until forces opposing the United States find the gap around our air bases and begin to exploit it. Moreover, host nations and sister services, in accordance with their doctrine, may be involved in more significant offensive operations, unable to focus on the needs of expeditionary air and space forces. Consequently, the Air Force needs an expeditionary security force with the force structure and training to meet steady-state AEF needs as well as provide combatant commanders with a unified, highly trained force

capable of moving beyond the TAOR to meet the enemy: five, 10, or maybe even 15 kilometers from the air base. This concept does not mandate a stand-alone force. Rather, expeditionary security forces need to work with other support-group units, Office of Special Investigations detachments, host nations, and sister services to achieve synergy in base-defense operations.

To repeat, radical times demand radical changes. In Vietnam, who would have thought a B-52 could drop a bomb guided precisely to a target by a satellite constellation? Now such practices are accepted as the norm for Air Force operations. Even though the Air Force willingly underwent these kinds of revolutionary changes, today's security forces are much like those BUFFs that flew in Vietnam. Security forces need to become more precise, lethal, and capable. Reorganizing, accepting moderate risk at CONUS installations, and creating at least four more expeditionary security-forces groups make for a good place to start. In accepting these recommendations, the Air Force will go a long way toward insuring that the eagle's talons become significantly sharper. □

Notes

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Slow Airpower Assessment

A Cause for Concern?

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Editorial Abstract: To achieve timely airpower assessment, one might think it mandatory to speed up "assessment tempo" to match "operations tempo," but reality is more complex. Colonel Berg first surveys how assessment speed evolved over time and then analyzes how emerging doctrinal concepts such as effects-based operations and predictive battlespace awareness relate to the pace at which we assess air operations.

STRATEGIC ATTACK AND interdiction can produce effects quickly during major combat operations, but assessing those effects takes time. Battle damage assessment (BDA) provides a quick estimate of damage on specific targets, but determining an ongoing campaign's operational- and strategic-level effects takes longer.[1] The terms *operations tempo* and *assessment tempo* reflect the scale and pace of military activity and efforts to evaluate the effects of military operations, respectively. The two processes display a close relationship. As recently as the Vietnam War, strategic bombing and interdiction campaigns lasted months or even years. The relatively slow pace of air operations resulted in assessment techniques that provided ample time for methodical analyses. These analytical techniques categorized past bombing results more than they anticipated the progress of an ongoing campaign. Operation Desert Storm represented a turning point for assessment requirements. Parallel attack with precision-guided munitions (PGM) dramatically accelerated aerial operations tempo; however, assessment tempo did not keep pace.

Not all airpower roles are equally prone to disparities between operations and assessment tempos. For example, success or failure of airlift, air refueling, and close air support (CAS) quickly becomes apparent. Evaluating the overall effects of strategic attack and interdiction takes more time. Historically, the time required for the cumulative effects of attacks to become manifest determined strategic attack and interdiction assessment times. Slow assessment processes were acceptable when campaigns proceeded at a corresponding pace, but increased operational tempo shortened the available assessment time.

The following discussion examines the time dimension of strategic attack and interdiction assessment, the reason that an apparent gap exists, and the ways this poses both challenges and opportunities to emerging doctrinal concepts such as effects-based operations (EBO) and predictive battlespace awareness (PBA).

Origins of the Tempo Disparity

Tracing the past relationship between operations and assessment tempos reveals the current correlation between these activities. During World War I, observers realized that aerial bombing inflicted only limited physical dam-

age; therefore, they emphasized effects on intangible factors such as morale. The war's protracted nature assured that any operational or strategic effects attributable to bombing would slowly accumulate. Wartime bombing assessments provided little more than speculation; however, British and American Airmen performed relatively ambitious postwar bombing surveys. From March to May 1919, the US Army Air Service dispatched 12 three-man teams of military members to places previously bombed by US planes. The teams evaluated the financial costs of repairs, number of casualties, lost war production at factories, and morale effects attributable to bombing. They devoted little attention to analyses of strategic effects. Survey results came too late to influence the war; instead, the survey provided an early benchmark for postwar airpower assessments.[2]

The idea of performing methodical assessment of ongoing strategic bombing campaigns gained prominence during World War II, but the methods used were slow and emphasized economic trends. In late 1942, the Committee of Operations Analysts (COA) and the Enemy Objectives Unit (EOU) began work. The COA consisted mostly of civilian experts who sought to improve target selection and estimate when the bombing would weaken the German war machine enough to permit a successful Allied invasion.[3] The EOU, a part of the Office of Strategic Services (OSS) that was the predecessor of the Central Intelligence Agency (CIA), performed similar long-term studies. In late 1944, the Joint Target Group (JTG) superseded the COA. It operated in the Pacific theater much as the COA had done in Europe. Each bomber command headquarters established an operations analysis section that examined bombing accuracy, aircraft loss rates, and other parameters. Analysts accepted the fact that bombing effects accrued, and trends would often take months to become apparent.

Army Air Corps leaders envisioned a postwar strategic attack assessment analogous to but more extensive than the post–World War I survey. They requested an independent body led by civilian experts. Their vision culminated in the establishment of the United States Strategic Bombing Survey (USSBS) in 1944. Consisting of about 300 civilians and 950 military members, the survey field teams collected data during the latter stages of fighting in Europe.[4] Like the COA and EOU, the USSBS investigated economic and industrial conditions as central factors in its analyses. The Army Air Forces tried to apply European survey findings to bombing campaigns against Japan, but differences between the theaters and the time required to interpret European theater data hampered that effort. Findings of survey teams who entered Japan after the war contributed to vigorous disputes between Army Air Corps and Navy officials about the relationship between strategic bombing and Japan's surrender. Evaluating the strategic effects of the atomic bombings proved especially controversial.[5] New data required time to collect and interpret; consequently, the USSBS did not publish all of its Pacific theater reports until almost a year after the war.

Groups like the COA and USSBS lacked incentives to perform rapid analyses. World War II involved a lengthy struggle between opposing mass-production economies whose wartime systems proved resistant to the sequential mass attacks bomber fleets performed. The COA looked at the cumulative effects of repeated strikes and accepted delays of weeks or longer while evaluating operational- and strategic-level results. Wartime analysts, hoping to improve future bombing effectiveness, looked to the past for ideas. As a predominantly postwar effort, the USSBS studied previous strategic bombing and faced only limited pressure to complete its work quickly. Apart from an incentive to apply lessons learned in Europe to the Pacific, a primary motivation for USSBS members to complete their work involved the desire to return to normal civilian life after the war.

World War II interdiction campaigns received less attention than strategic bombing, but their assessment continued to take considerable time. Groups such as the COA concentrated on strategic bombing, leaving interdiction assessment mostly to theater-level commanders. For example, Operation Strangle

in Italy proposed cutting supplies to enemy forces, a process that would presumably take time. Commanders hoped the operation would starve German forces and force them to withdraw from a fortified defensive line. Ground forces attacked the German lines after nine weeks of air interdiction failed to dislodge them. The Germans retreated when attacked, but the reasons for the retreat were unclear at the time. The campaign's more modest results did not become apparent until decades later when analyses showed the Germans held adequate supplies; however, the air attacks destroyed their motorized vehicles, thereby crippling their tactical mobility.[6]

Nuclear weapons strongly influenced bombing assessment during the Cold War. Strategic attack assessment became associated with nuclear war planning and proceeded at a deliberate pace as analysts scrutinized potential targets for annual editions of plans such as the Single Integrated Operational Plan (SIOP). If war broke out, leaders wanted to quickly determine which targets were hit. Comprehensive analyses seemed unnecessary because nuclear weapons would presumably obliterate wide areas, precluding further inquiry; however, meticulous bombing analyses remained important for conflicts using conventional weapons.

As in World War II, the Korean and Vietnam Wars seldom demanded quick strategic attack or interdiction assessments. Campaigns lasted months or years, and assessment was correspondingly slow. Both Korea and Vietnam included strategic attacks, but interdiction was the prevalent airpower role.

Eager to demonstrate its prowess in Korea, the newly independent USAF established groups such as the Barcus Board and the Tactical Air Power Evaluation (TAPE) group (later replaced by the Tactical Air Research [TAR] group) to assess ongoing air operations. These groups emphasized tactical- over strategic-level results.[7] After a stalemate developed in Korea, the United States conducted lengthy interdiction efforts such as Operation Strangle, namesake of the World War II campaign. Operation Strangle in Korea and Operation Saturate, which followed it, sought to deprive frontline enemy forces of supplies, and lasted a total of about one year. Analysts devoted considerable effort to evaluating both campaigns, even though ground forces did not test their effectiveness by attempting a breakthrough, as in Italy. Air leaders, initially optimistic about interdiction's prospects, gradually concluded that neither campaign succeeded. The United States conducted no USSBS-style evaluation after Korea.

The Vietnam War revealed a mixed influence on assessment tempo. Assessment reflected the war's deliberately protracted operations tempo. The USAF and other agencies measured almost every conceivable parameter; undertook broad, ongoing appraisals of campaigns; and produced a constant stream of reports and analyses. In 1962 the USAF began the Current Historical Evaluation of Counterinsurgency Operations (CHECO) program, whose reports on diverse topics sought to acquire airpower lessons as rapidly as possible.[8] It launched a second ongoing program, *Project Corona Harvest*, in 1967. Both programs analyzed events with an eye toward improving future performance. Corona Harvest continued into the postwar years and became the "most ambitious effort ever undertaken by Air University to study and develop lessons learned from a conflict in progress."[9] The RAND Corporation published studies related to airpower assessment that reexamined some World War II and Korean War interdiction campaigns.[10] The CIA and the recently formed Defense Intelligence Agency (DIA) played prominent assessment roles, often in competition with the USAF. The Air Force remained optimistic that strategic bombing and interdiction would ultimately succeed in Vietnam. It developed the capability to interpret extensive BDA data in ways that suggested effectiveness, but the war's disappointing outcome discredited the assessment methods used. The capability to process large quantities of data in a timely manner declined after Vietnam. The USAF did not perform a postwar Vietnam bombing survey.

Upon review, assessment reflected a more forward-looking orientation in Vietnam than

in previous wars. Analysts tried to develop interdiction assessment into a discipline that could predict the results of alternative strategies and measure the effects of ongoing operations. Mathematical modeling of enemy transportation networks—combined with state-of-the-art computer technology—promised to reveal in advance which key targets might yield dramatic results if attacked. Presumably, assessments could then quickly show whether the anticipated effects had occurred. In fact, the results of Rolling Thunder, Commando Hunt, and other campaigns proved disappointing. Rolling Thunder lasted three and one-half years and signified that assessments would be exceedingly slow. Computer simulations offered quick predictions, but analysts ignored the fact that campaigns were falling short of expectations. An assortment of air and ground sensors monitored enemy road networks, yet analysts failed to integrate sensor data well enough to maintain awareness of enemy actions. Computer models proved unable to predict the consequences of likely countermeasures.[11] Vietnam War efforts to achieve *battlespace awareness* demonstrated the difficulties of such an undertaking, at least when using the technologies available at that time.

Desert Storm marked an assessment turning point. Strategic attack and interdiction operations tempos accelerated dramatically, although assessment tempo did not increase proportionally. The war moved at too fast a pace for traditional assessment techniques. Intelligence agencies simply could not process data quickly enough. Basic tasks like target-status determination proved questionable and time consuming, as competing intelligence agencies produced divergent findings. Air Force analysts offered optimistic bombing appraisals, but CIA skepticism prompted Gen Norman Schwarzkopf, the combatant commander, to write, "If we'd waited to convince the CIA, we'd still be in Saudi Arabia."[12] Once the ground offensive commenced, the Iraqi forces rapidly collapsed, as air operations exceeded analysts' predictions. For the first time since the USSBS, the United States conducted a postwar airpower investigation, the Gulf War Air Power Survey (GWAPS). The GWAPS noted that "few assertions about the Gulf War could command as much agreement as the inadequacy of BDA, but the survey found no such agreement about the causes of inadequacy."[13] The complicated BDA problems spurred efforts to revamp assessment methods, but the war's spectacular success may have dampened the motivation to perform a major overhaul.

Despite eight years of effort following Desert Storm to improve analytical methods, assessment tempo remained unable to match operations tempo. During Allied Force, the 78-day campaign designed to coerce Serbian president Slobadan Milosevic to comply with UN resolutions, strategic attack and interdiction operations featured strikes against Serbian military and economic targets. The campaign's anticipated short duration affected planners' capability to assess ongoing operations. Only after the operation expanded beyond the capacity of the few operations analysts deployed did additional assessment personnel arrive. Analysts scrambled to get organized and catch up with their assessment tasks before the war ended.[14] Determining the role of air operations in Milosevic's eventual capitulation proved difficult despite the availability of a large amount of data. Real-time video feeds from UAVs and plentiful data from other sources yielded unlimited feedback about operations, but interpreting all that data promptly exceeded capability. During the war, analysts hesitated to predict the relative effectiveness of strikes against fielded forces and other target sets, and then seemed surprised when Milosevic acceded to coalition demands. Later studies suggest that strikes against fielded forces were less damaging than initially believed. As in Desert Storm, analysts experienced considerable difficulty assessing Allied Force while it was in progress, yet the campaign achieved its objectives. The USAF conducted a postwar study called *Air War over Serbia* (*AWOS*).[15]

In comparison to Desert Storm, Enduring Freedom's strategic attack and interdiction happened on a smaller scale and was of relatively short duration. The primary strategic attacks took place against time-sensitive targets

(TST) such as enemy leaders. Determining the success of these hits became the key assessment issue. Interdiction focused not so much on cutting supply lines to frontline troops as in World War II and Korea, but on destroying enemy forces trying to approach or flee the battlefield. Interdiction results were quickly apparent. In contrast to Allied Force, Afghanistan air operations were part of a joint effort to seize territory; as a result, how quickly ground forces occupied key areas became a primary indicator of airpower's effectiveness.

In Afghanistan, assessment tempo was a key factor. Analysts received a great deal of BDA information, much of which concerned CAS operations. They needed more time to consider operational- and strategic-level results because events unfolded quickly. The cumulative effects of successive tactical engagements led to the desired operational and strategic effects. Rather than trying to account for all the rapid-fire tactical engagements, analysts concentrated on assessing TST strikes and deciding where to position intelligence, surveillance, and reconnaissance (ISR) assets to observe planned attacks. Although actively pursued, strikes against TSTs proved difficult to assess, even in retrospect. Fast-moving and successful major combat operations complicated wartime efforts to determine exactly how strategic attack and interdiction contributed to victory.

Iraqi Freedom's strategic attack and interdiction happened on a much larger scale than in Enduring Freedom. An assessment of the two campaigns provides little data to accurately compare their levels of success. Strategic attacks sought to minimize lasting economic damage, while producing a "shock and awe" morale effect on opposing forces. Whether these attacks produced the desired psychological effect and deterred Iraqi use of weapons of mass destruction (WMD) could not be ascertained during the war. As in Afghanistan, strikes against TSTs were prominent, yet hard to assess quickly. The time required to determine the status of efforts to hit Saddam Hussein provides a notable example.[16] Interdiction focused on destroying enemy forces in place and hindering their movement, instead of stopping supply flows. Whatever specific effects strategic attack and interdiction produced, the Iraqi military's rapid collapse suggests their effectiveness, even if analysts did not understand them at the time. Furthermore, attributing strategic-level results to air operations as opposed to the combined action of air and surface operations proves difficult for both the Afghan and Iraqi campaigns. The rapid success of Iraqi Freedom's major combat operations did not rely upon a full and timely understanding of how strategic attack and interdiction contributed to the outcome.

If we are to find solutions to this dilemma, new methods must evolve to provide data that optimizes our combat efforts. The following questions would be relevant: should Airmen care if assessments do not reveal whether air operations were successful at the time they occurred? Should operations tempo and assessment tempo be synchronized? Would this be too difficult? If airpower assessment should provide relevant feedback about ongoing operations and the pace of operations cannot slow down, then speeding up assessment appears to be the only possible course of action. Emerging doctrinal ideas might provide some answers to accomplish the synchronization of operations and assessment.

Current Doctrine and Assessment Tempo

Demands for prompt airpower assessment increased significantly in recent years. Unlike World War II, recent wars were not protracted contests between mass-production economies. Aerial attacks proceeded simultaneously rather than sequentially. Advanced sensors and computer technology collected and processed vast amounts of data, but interpretation lagged far behind. Some effects, especially at the strategic level, take time to manifest themselves. After those effects become apparent, analysts need time to collect and interpret the data before reporting findings to decision makers. Merely collecting data faster did not hide the fact that rapidly acquiring great amounts of data does not necessarily assure better assess-

ment. In fact, the opposite may occur. An excess of data may swamp analysts and reduce the assessment process to what happened during the Vietnam War. *Joint Vision 2020* notes that "advances in information capabilities are proceeding so rapidly that there is a risk of outstripping our ability to capture ideas, formulate operational concepts, and develop the capacity to assess results."[17]

When a military function needs improvement, one approach involves reviewing applicable doctrine. Current doctrine offers guidance for assessing strategic attack and interdiction. The concept of combat assessment (CA) becomes a logical starting point. Joint doctrine divides CA into three elements: BDA, munitions effectiveness assessment (MEA), and reattack recommendation (RR).[18] Some USAF manuals replace RR with mission assessment (MA), which "evaluates the effectiveness of a . . . mission on the adversary's warfighting and sustaining capabilities."[19] Regardless of these differences, BDA provides "a timely and accurate estimate of damage or effect resulting from the application of military force . . . against a predetermined objective" and continues to be the CA element most closely related to the current discussion.[20] Joint doctrine describes BDA as a recurring process conducted in three time-related phases: phase 1, *physical damage assessment*, which consists of "an estimate of the quantitative extent of physical damage . . . to a target element based on observed or interpreted damage," and "released one to two . . . hours after receipt of source data, in order to facilitate the tactical and operational commander's battlespace awareness and rapid reattack or reallocation decisions within the current ATO or similar plan"; phase 2, *functional damage assessment*, which provides "an estimate of the effect of military force to degrade or destroy the functional/operational capability of a target to perform its intended mission," due "within four to six . . . hours after information receipt," and "cumulative in reporting BDA information from previous attacks"; and phase 3, *target system assessment*, which gives "a broad assessment of the overall impact and effectiveness of military force applied against an adversary target system relative to the operational objectives established" (normally, commanders should "release a single Phase 3 report each day").[21] All three BDA phases evaluate previous events, and even the fastest phase requires at least an hour.

Current doctrine supports other assessment concepts. Some USAF doctrine manuals use operational assessment (OA), a term not included in joint doctrine. This new concept "occupies a higher level than combat assessment and includes the overall analysis of enemy operations, their reaction to friendly operations, and recommendations for changes or adjustments to friendly strategy based on overall observations."[22] OA seeks a broader understanding of how airpower results relate to operational and strategic objectives and builds upon the objective analysis of the BDA.[23] As a result, it turns out to be more than a protracted type of phase-three BDA. For example, to halt an enemy advance, "operational assessment would also monitor suspected enemy intentions and what changes to their operational plan might result from a successful halt."[24] A doctrine document on strategic attack notes that "operational and campaign assessment . . . must go beyond assessments of battle damage or weapons effectiveness to anticipatory judgments about what effects strategic attack may have."[25] Taking into consideration ongoing air operations and their effect on future enemy actions signals an important shift in emphasis from most previous assessment thought.

Assessment Tempo and Emerging Doctrinal Concepts

Emerging concepts such as EBO and PBA depend on the time dimension of airpower assessment. The EBO concept corresponds to both phase-three BDA and OA in that it draws linkages between target damage and the achievement of overall military objectives. Although not an official joint-doctrine term, EBO provides an important component of timely assessment. Air Force doctrine defines

EBO as "actions taken against enemy systems designed to achieve specific effects that contribute directly to desired military and political outcomes."[26] An Air Force publication acknowledges the assessment challenges of EBO:

> What's lacking is sophisticated analysis predicting the results of many tactical actions to determine their cumulative impact at the operational and strategic levels of war. The USAF is seeking to develop the course of action and predictive campaign-model decision support tools needed to conduct this type of analysis. These effects-based support tools will enable the new concept of predictive battlespace awareness (PBA) that seeks to help commanders and staffs anticipate a conflict's critical events.[27]

Gen John Jumper, Air Force chief of staff, credits PBA as allowing for "targeting those events that our predictive power leads us to anticipate. We are aiming for a forensic-level understanding of the battle space in all four dimensions. PBA will allow us to anticipate the right move rather than simply react to enemy moves."[28] PBA seems to require an even more comprehensive understanding of the battlespace than EBO and to require it even faster. How can these requirements be met?

Col John Boyd, USAF, retired, developed the concept of the observe, orient, decide, and act (OODA) loop.[29] Assessment occurs in the "observe" and "orient" parts of the OODA loop. If analysts know what to observe, they may be better able to orient themselves by interpreting the operational and strategic results of ongoing operations. Generally, faster OODA-loop cycles provide better results than slow ones. Ideas like OA, EBO, and PBA seek to alter the time dimension of airpower assessment. Traditionally, assessment sought to comprehend the significance of past events, but recent trends, since the Vietnam War, try to shift the assessment time frame closer to the present. PBA tries to pull the assessment time frame through the present and push it into the future. It attempts to transcend the OODA loop by altering the orient part of the loop. "Orient" would then become "anticipate."

The find, fix, track, target, engage, and assess (F2T2EA) cycle (also called the "kill chain") emerges as a concept related to the OODA loop. The kill chain clearly links operations and assessment tempos, and, like the OODA loop, speed remains a central theme. Compressing events into a few minutes holds significant implications for assessing TST strikes of the type encountered in recent operations. "Assess," the last link in the chain with its priority on speed, assures that such assessments would probably resemble a "hit or miss" phase-one BDA rather than broader evaluations.

Applying the OODA loop and F2T2EA-cycle concepts to airpower assessment implies that faster assessment will be better. In some cases that will be true. The time dimension of assessment imparts an important conceptual link between EBO and PBA. EBO produces effects; assessment then examines these effects and determines if they exist or not. PBA can be perceived as EBO projected into the future. Assessment needs to be oriented towards the future to support PBA. If assessment stays locked in a backward-looking perspective, then PBA may be unachievable. Concepts like OA already try to predict future battlespace conditions and enemy activities.

EBO may offer a way to streamline data requirements and accelerate assessment tempo to support PBA. Planners could then decide which targets merited priority BDA attention. Among priority targets, EBO- and PBA-type data-sampling techniques might offer an alternative to the necessity of processing vast quantities of BDA data in a short time. Instead of trying to track every event, EBO and PBA would establish assessment priorities in advance. Computer models tempered with human judgment could help analysts accurately forecast the results of planned operations. Ideally, assessment would amount to comparing actual results with predictions. A complete description of the battlespace might not be required. Knowing key effects allows analysts to anticipate and focus on relevant pieces of data and acquire the information needed to complete their analyses.

However, all inputs to EBO and PBA do not require rapid assessment tempo. Detailed operational- and strategic-level assessments may not be available until a war has been in progress for a while. For example, the USSBS did not start until 1944, and Corona Harvest did not begin until 1967, fully two years after Rolling Thunder began. The Air Force did not commission the GWAPS until almost six months after Desert Storm ended.[30] The *AWOS* report did not appear until over a year after Allied Force ended. Postwar assessments do not contribute to the current war but may still prove important to employing EBO and PBA in future wars. Correctly anticipating enemy responses and the ways airpower can best be used to exploit them might be based on modeling. One way to calibrate predictive models would be to understand how adversaries responded to previous airpower applications. Uncertainty will always exist, as every war differs, but thorough retrospective evaluations of airpower's operational and strategic results would be one way to reduce uncertainty. The Vietnam War experience discredited the computer modeling used but not the value of the idea.

Conclusions and Cautions

Operations tempo proceeds faster than assessment tempo, but emerging concepts such as EBO and PBA offer a conceptual template for narrowing the gap by showing how to assess strategic attack and interdiction quicker by assessing them smarter. However, caution should be in order. Strategic attack and interdiction assessment may never be impartial scientific inquiries because of institutional pressures to interpret bombing results in certain ways. Like any organization, the Air Force prefers to publicize successes rather than failures. The Army Air Corps supported the USSBS, and the USAF endorsed the GWAPS and *AWOS* but never published comprehensive postwar appraisals of the Korean and Vietnam Wars. Furthermore, interservice rivalry influenced appraisals such as the USSBS. If analyses of past campaigns would be useful for PBA, then both successful and unsuccessful campaigns need to be included, and interservice disputes should not be allowed to distort assessments.

Another caution involves the duration and intensity of wars. The EBO and PBA concepts may work for short, high-intensity wars in which adversaries lack time to adapt to strategic attack and interdiction. If US forces gain enough battlespace awareness to anticipate and thwart enemy responses, then assessment concepts geared towards comparing actual results to projected results might support PBA. Intelligent choices must be made when numerous concurrent air activities occur. The highest assessment priority would allow analysts to concentrate on the operational and strategic events that provide the greatest return. Such "predictive assessments" would focus more on tracking progress towards the creation of desired future effects than on cataloguing the results of previous attacks.

Unfortunately, rapidly victorious campaigns may weaken the desire for thorough assessment. Recent wars pitted US airpower against opponents who possessed few viable options other than to endure air attacks as long as possible. A feeling of certainty in future campaigns could lull leaders into a sense of false security and lead them to abandon the search for an understanding of the effects of air operations. Combat against an opponent capable of inflicting serious reverses on US military forces would likely bring about demands for more rigorous assessment. The possibility of assessment problems increases if air operations become protracted or confined to a slow operations tempo. These types of campaigns allow enemies more time to adapt and devise unexpected courses of action. This could cause the breakdown of airpower assessment plans based on PBA. Strategic attack and interdiction appear suited to EBO and PBA assessment methods, but neither plays a prominent role in counterinsurgency operations like those currently happening in Afghanistan and Iraq. A rapid campaign limits the possible scope of data analysis, but a protracted one might lead to excessive and unnecessary analysis. Campaigns like Rolling Thunder saw too many details being assessed instead

of a precise focus on strategic results. Today's analysts, armed with advanced computer technology, could attempt to interpret every available bit of data in order to gain more insight into a campaign. The successful exploitation of emerging doctrinal concepts might synchronize operations and assessment tempos and alleviate many potential problems.

Doctrine highlights the issue, but the difficult task of achieving the promise of EBO and PBA in airpower assessment requires the procurement of trained people and development of the hardware, software, and procedures to accomplish the mission. □

Notes

1. Federation of American Scientists, "Military Acronyms, Initialisms, and Abbreviations," http://www.fas.org/news/reference/lexicon/acb.htm. BDA initially stood for "bomb damage assessment." The recent terminology change reflects the recognition that means other than bombs can exert military effects on targets.

2. Maurer Maurer, ed., *U.S. Air Service in World War I*, vol. 4, *Postwar Review* (Maxwell AFB, AL: Air Force Historical Research Agency, 1978), 363–505.

3. Wesley F. Craven and James L. Cate, eds., *Army Air Forces in World War II*, vol. 2, *Europe, Torch to Pointblank, August 1942 to December 1943* (1949; repr., Washington, DC: Office of Air Force History, 1983), 353–67.

4. USSBS, *United States Strategic Bombing Surveys: European War, Pacific War* (1945, 1946; repr., Maxwell AFB, AL: Air University Press, 1987), 3 and 46.

5. David MacIsaac, *Strategic Bombing in World War II: The Story of the United States Strategic Bombing Survey* (New York: Garland Publishing, 1976), 119–35, describes interservice bombing-assessment disputes. Chapters 3 and 4 mention applying European findings to the Pacific theater.

6. F. M. Salagar, *Operation "Strangle" (Italy, Spring 1944): A Case Study of Tactical Air Interdiction*, Rand Report R-851-PR (Santa Monica, CA: RAND, 1972); and United States Air Force, *The Uncertainty of Predicting Results of an Interdiction Campaign: Saber Measures (Alpha)* (Washington, DC: Assistant Chief of Staff [Studies and Analysis], 1969).

7. Robert Futrell and Albert Simpson, *United States Air Force Operations in the Korean Conflict, 25 June–1 November 1950*, USAF Historical Study No. 71 (Washington, DC: Department of the Air Force, 1952), 114.

8. The meaning of the CHECO acronym changed several times. Originally, it stood for Current Historical Evaluation of Counterinsurgency Operations. In 1965 it became Contemporary Historical Evaluation of Counterinsurgency Operations but changed in 1966 to Contemporary Historical Examination of Combat Operations. In 1968 it became Contemporary Historical Examination of Current Operations.

9. United States Air Force, *Air University History: The Vietnam War Era* (Maxwell AFB, AL: Office of History, Headquarters Air University, 1995).

10. Salagar, *Operation "Strangle" (Italy, Spring 1944)*.

11. J. W. Higgins, *Concepts, Data Requirements, and Uses of the LOC Interdiction Model as Applied to North Vietnam*, RAND Report RM-6065-PR (Santa Monica, CA: RAND, 1970), exemplifies computer modeling of transportation networks; and Eduard M. Mark, *Aerial Interdiction: Air Power and the Land Battle in Three American Wars*, Special Studies Series (Washington, DC: Office of Air Force History, 1994), chap. 10, describes sensor usage in interdiction campaigns.

12. H. Norman Schwarzkopf, *It Doesn't Take a Hero* (New York: Bantam Books, 1992), 501.

13. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey, Summary Report* (Washington, DC: Department of the Air Force, 1993), 138.

14. Richard F. Bird, "Operations Research Support to the Combined Air Operations Center during the Air War over Serbia," *Phalanx* 34, no. 2 (June 2001): 10–16.

15. United States Air Force, *Air War over Serbia* (foreword by Gen Michael E. Ryan, chief of staff) (Ramstein AFB, Germany: US Air Forces in Europe, [Studies and Analysis Directorate], April 2000).

16. "Saddam: Dead Or Alive?" *CBS NEWS.com*, 9 April 2000, http://www.cbsnews.com/stories/2003/04/09/iraq/main548585.shtml.

17. Joint Chiefs of Staff, *Joint Vision 2020* (Washington, DC: Director for Strategic Plans and Policy [J5; Strategy Division], GPO, June 2000), 8.

18. Joint Publication (JP) 2-01.1, *Joint Tactics, Techniques, and Procedures for Intelligence Support to Targeting*, 9 January 2003, VI-1.

19. Air Force Doctrine Document (AFDD) 2-5.2, *Intelligence, Surveillance, and Reconnaissance Operations*, 21 April 1999, 44.

20. JP 2-01.1, *Joint Tactics*, GL 6.

21. Ibid., VI-2–3, E-2–3.

22. AFDD 2-1.3, *Counterland*, 27 August 1999, 79.

23. AFDD 2-1.2, *Strategic Attack*, 30 September 2003, 26–27.

24. AFDD 2-1.3, *Counterland*, 80.

25. AFDD 2-1.2, *Strategic Attack*, 24.

26. Ibid., 46.

27. *Doctrine Watch no. 13: Effects-Based Operations (EBO)*, (Maxwell AFB, AL: USAF Doctrine Center, 30 November 2000), https://www.doctrine.af.mil/DoctrineWatch/DoctrineWatch.asp?Article=13.

28. Gen John P. Jumper, USAF, "Global Strike Task Force: A Transforming Concept, Forged by Experience," *Aerospace Power Journal* 15, no. 1 (Spring 2001): 30.

29. Keith H. Hammonds, "Strategy of the Fighter Pilot," *Fast Company* 1, no. 59 (June 2002): 98, http://pf.fastcompany.com/magazine/59/pilot.html.

30. *GWAPS, Summary Report*, ix.

Strategic Attack

CHARLES TUSTIN KAMPS

ONE CONCEPT, MORE than any other, serves as the raison d'être for an independent Air Force—strategic attack. Theoretically, although the Army, Navy, Marine Corps, and special operations forces are all capable of some degree of strategic attack, the Air Force and the Airman's perspective bring the concept into sharp focus. In fact, not until the summer of 2004 was US Strategic Command tasked to draft a joint publication on strategic attack—presumably because of previous impasses.

Both the birth of the air arm and modern thinking regarding strategic attack stem from the cataclysm of World War I, characterized by the ability of surface forces to kill their enemies by the hundreds of thousands and an equal inability to produce a decision on the battlefield. World War I aviators saw future warfare dominated by aircraft that could carry the fight directly to the enemy's centers of gravity yet avoid the stalemate of the trenches—*strategic* rather than tactical attack.

During the interwar years, theorists such as Giulio Douhet, Hugh Trenchard, and William "Billy" Mitchell, as well as institutions such as the Air Corps Tactical School, presented competing theories of strategic attack, many of them later put to the test in the crucible of World War II but often with disappointing results. Despite the validity of the conceptual foundations, the US military generally lacked resources to conduct such attacks from the air. Only the atomic strikes against Japan in the last days of the war approached strategic attacks on the scale envisioned by the early airpower advocates. Understandably, postwar strategic thinking became almost exclusively a *nuclear* planning process.

In the late 1980s, technological and theoretical developments gave strategic attack a renewed conventional dimension. The advent of reliable precision-guided munitions and stealthy air platforms, combined with Col John Warden's idea of *parallel strategic attack*, meant that US aircraft could engage enemy centers of gravity throughout the depth and breadth of a theater with nonnuclear munitions. The cascading effects and catastrophic system failures brought on by such attacks enable joint forces to accomplish their tasks at a higher tempo of operations against a disrupted enemy. This rebirth of strategic attack invalidated the old way of designating heavy bombers as strategic platforms and fighters as tactical platforms. Because the term *strategic* now applies to the nature of the *target* and because many aircraft now conduct essentially strategic strikes, *every* bomb can become a strategic weapon, and nearly every platform can function as a strategic delivery system.

Air Force Doctrine Document (AFDD) 2-1.2, *Strategic Attack*, 30 September 2003, defines its subject as "offensive action conducted by command authorities aimed at generating effects that most directly achieve our national security objectives by affecting an adversary's leadership, conflict-sustaining resources, and/or strategy" (p. 1). Although the Air Force is admirably suited to deliver such attacks, no one claims that the air arm can "do it alone" or that the other services have no role in accomplishing national objectives. Quite the contrary, the new emphasis on *interdependent* operations—a stronger affiliation than *joint*—probably means that the Air Force will have to commit more resources to the direct support of surface forces rather than undertake traditional strategic strike operations.

To Learn More . . .

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Operation Summit CAP

Enabling New NATO Members to Meet New Threats

COL JAMES R. SMITH, USAF

Editorial Abstract: A unique, bilateral air-defense arrangement between the USAF and Czech air force protected 46 heads of state from terrorist air attack during the NATO summit of November 2002 in Prague. This effort, known as Operation Summit CAP (combat air patrol), proved to be an exceptionally effective means of accelerating the integration of a new alliance member into NATO operations.

This is the most important operation NATO will undertake this year [2002].

—Gen Joseph Ralston
Supreme Allied Commander, Europe

THE NORTH ATLANTIC Treaty Organization's (NATO) summit of November 2002 in Prague, Czech Republic, was unquestionably a landmark event for the alliance. Seven new members received invitations to join its ranks, NATO made commitments to reorganize its military structure, and—in a major step toward combating new threats in the twenty-first century—a NATO Response Force came into being as members agreed to conduct operations outside the alliance's traditional boundaries. Examining its role in the global war on terrorism, NATO embraced the leadership of the International Security Assistance Force in Afghanistan as a direct result of commitments made at the Prague summit. The simple fact that NATO held a meeting of this scope for the first time in one of the states granted membership in 1998 sent an important signal to other prospective members and to the alliance as a whole: NATO was at a crossroads, determined to remain relevant to every one of its partners, new and old alike.

Behind—or, more properly, "above"—the scenes, where alliance heads of state reached

these momentous decisions, another important dimension of NATO's success in dealing with challenges posed by the global war on terrorism unfolded. Even before the events of 11 September 2001, extraordinary measures would have been put in place to protect an assembly that might include up to 46 heads of state. The singular importance of this historic summit and the type of signal a successful attack would send worldwide provided plenty of incentive to prevent the kind of mayhem that modern terrorism can create. After 9/11, NATO took stock of its ability to deal with a new weapon in the arsenal of international terrorists—airliners hijacked by suicidal operatives. The air-defense arrangements conducted in support of the Prague summit would serve as an important test of the alliance's effectiveness in providing a collective defense against this type of threat.

NATO successfully met the challenge with an operation known to the US Air Force as Summit CAP (combat air patrol), which saw the NATO Integrated Air Defense System (NATINADS), the Czech air force (CZAF), and US Air Forces in Europe (USAFE) team up to provide the Prague summit round-the-clock protection from terrorist air attack. This effort, which relied on NATO's air-defense command and control (C2) structure, included surveillance from ground-based radar and NATO Airborne Warning and Control System (AWACS) aircraft, CZAF surface-to-air missile (SAM) batteries, CZAF and USAFE air-battle managers, USAFE aerial tankers, and combined CZAF/USAFE fighter CAPs.

Even more important than the impressive array of resources brought to the table for Summit CAP was the process of planning and preparation that went into this unique operation, especially the plans for engaging aircraft piloted by terrorists. The NATINADS would provide overall situational awareness for determining if a potential attack were under way. In terms of defeating such an attack, a CZAF/USAF bilateral air-defense force would protect the airspace by sharing responsibilities in ways never before attempted. A successful outcome would require a level of training and exercising unprecedented in an effort involving one of NATO's new members.

The first significant NATO contingency operation conducted in and over the territory of a new partner in the alliance, Summit CAP offered the Czechs an opportunity to prove they were prepared to assume full responsibility for such an endeavor. Although the CZAF had made great strides in modernizing its weapons and C2 systems since 1998, the air force needed more work before it could become a seamless part of the NATINADS. The daunting task of protecting such a lucrative target as the Prague summit proved to be just the catalyst for more fully integrating the CZAF, making it interoperable with NATO in every sense of the word. That outcome proved just as important as declaring "mission success" for the operation at the summit's conclusion.

The Problem

Since its inception, NATO has emphasized collective defense against a common enemy. Through more than four decades of the Cold War, it developed extremely robust air defenses to counter an attack by the Warsaw Pact. After the Berlin Wall came down, the alliance no longer needed a vast array of high-readiness interceptors and SAM batteries throughout central and western Europe. But the "system" itself was not dismantled. Indeed, NATO continued to make technical and procedural improvements to the NATINADS in the decade after the dissolution of the Warsaw Pact, a process that continued as former Pact members Poland, the Czech Republic, and Hungary became part of the alliance in 1998. In a larger sense, the dominance that key NATO members had demonstrated in the first Gulf War and later over Kosovo proved beyond a doubt that their air forces were fully capable of defending member nations from attack.

Even though the NATINADS was not "tailored" to deal with attacks like those on the World Trade Center and Pentagon, the system did bring quite a bit to that fight by virtue of its decades-long program of development.

Ground-based and aerial radar surveillance, capable of monitoring every cubic inch of central European airspace, used secure, redundant communications systems to collect and fuse data, displaying it in real time for seasoned decision makers in 10 combined air operations centers (CAOC) located around the continent. Fighter interceptors stayed on high alert, ready to respond within minutes to identify and monitor suspicious aircraft. In the post–Cold War European environment, NATO referred to its day-to-day air-defense operations as "air policing," primarily designed to counter smuggling or deal with the unusual or unexpected. This capability proved vital after the emergence of the new terrorist threat in 2001.

However, air policing for hijacked airliners was no easy task, especially from the political perspective. A fundamental tenet of NATO holds that each nation reserves the authority to exercise sovereign rights in and over its own territory.[1] That precept became central to the issue of coping with an adversary who had no scruples about using a commercial airliner filled with innocent people as a weapon, killing the passengers as well as many more civilians on the ground. Thus, determination of hostile intent on the part of the aircraft in question proved far more problematic than ascertaining the intent of military aircraft during a state of conflict.

Indeed, NATO designed its NATINADS to defend against military aircraft, and all alliance members have generally agreed upon air-defense rules of engagement (ROE) during a conventional conflict. But each member has examined the question of shooting down a civil aircraft within the confines of its borders a little differently. Ideally, most of the countries would prefer to use their own military resources if such a necessity should arise. Assets used for nonlethal aspects of air defense are easily shared, as occurred when NATO AWACS aircraft supported Operation Noble Eagle in the United States for several months. Understandably, though, severe repercussions would follow if a non-US allied fighter shot down an airliner over a major American population center—especially as the result of an erroneous decision to engage.

Of course, not every NATO member can deal with a terrorist air threat through military intervention. Since Luxembourg and Iceland, for example, have no air forces of their own, they must rely on arrangements with the alliance or one of its members to protect themselves from attack. The United States, United Kingdom, and Germany, however, have the kind of air and ground-based forces capable of sustaining a persistent defense against aircraft flying at all altitudes and in all weather conditions. Similarly, Italy proved itself very much equal to the task in its air-defense operations designed to protect the first NATO summit conducted after 9/11 (Rome in May 2002). Specific NATINADS procedures developed after September 2001 identified the engagement authority for suspected terrorists and the ways in which each member nation would authorize and conduct a final engagement. The Czechs wanted to make that final engagement decision over their republic themselves and, ideally, execute it with their own fighters. In fact, their parliament assigned this engagement authority by name as a matter of law.

The CZAF maintained MiG-21 fighter aircraft on alert daily as part of the NATINADS and protected key infrastructure with SAMs, thus providing the means to engage terrorist attacks against Czech territory or to broadly defend against a series of attacks against central Europe in general. In terms of protecting an event of the Prague summit's magnitude, however, the daily alert posture needed considerable reinforcement in order to present an effective defense against multiple, coordinated attacks on the Czech capital. The central problem confronting the CZAF was its limitations in terms of fighter aircraft and their weapons.

Even before NATO accession took place, the Czech Defense Ministry faced the problem of replacing the aging MiG-21 interceptors. Only half a squadron was operationally capable by the fall of 2002. The MiGs could not refuel in flight to facilitate long-duration

CAPs, and their short-range, infrared-guided missiles were only marginally effective in adverse weather. Their limitations in terms of numbers and lack of in-flight refueling meant that the MiG-21s could not maintain a constant presence aloft to protect the high-profile NATO summit. The CZAF planned to put its new, indigenous L-159 light attack aircraft to use in anticipated air-defense operations, but it could not reliably intercept aircraft flying at the altitudes and speeds typical of commercial airliners; furthermore, it had only short-range infrared missiles. To beef up its fighter defenses for the Prague summit, the Czechs turned to the alliance for help.[2]

This was no easy decision. The Prague summit, the first NATO event of its kind hosted by one of the three new member nations admitted in 1998, could well represent a major turning point for the alliance. Hosting it was a matter of considerable pride for the Czechs, who clearly wanted to demonstrate that they could faithfully meet the expectations of their allies. Unfortunately, the worst floods in over a century had ravaged Prague in July, and the citizens of the capital needed a boost in morale after that cataclysm. The last thing Czech officials wanted to do was send a signal that their country, now a full-fledged partner in the NATO alliance, could not overcome the challenges posed by Mother Nature or the global war on terrorism.[3]

Planning and Preparation

When Gen Joseph Ralston, NATO's supreme allied commander in Europe, learned of this issue of bolstering Czech fighter forces, he recommended that only one nation provide support. Despite the number of workable C2 options available to meet the needs of the situation, Supreme Headquarters Allied Powers, Europe wanted to counter terrorist air operations by having the NATINADS provide surveillance and initial identification of a potential threat. At that point, NATO would transfer authority to Czech national air-defense forces, and the Czechs would decide upon an appropriate course of action. Thus, the Czechs only needed to find a NATO partner willing to bolster their fighter assets.[4]

Soon after the Czechs approached the United States through diplomatic channels, senior military leaders considered the question of feasibility. Wearing his hat as commander of US European Command (USEUCOM), General Ralston asked Gen Gregory "Speedy" Martin, his air component commander for NATO's Allied Forces North (AIRNORTH) and the USAFE commander at Ramstein Air Base (AB), Germany, for his analysis of the situation. General Martin was in an ideal position to do so, ably supported by a team of expert planners in an organization he had created himself a year before—the USAFE Theater Air and Space Operations Center (UTASC). If tasked, he had the forces needed for the effort at his immediate disposal in Europe. Perhaps even more importantly, General Martin was the right man for the job because he, like General Ralston, wore more than one hat as a commander. In his capacity as AIRNORTH commander, he oversaw operations for the northern half of the NATINADS, including the Czech Republic as well as neighboring Germany and Poland. This position would have clear advantages from the outset of planning in terms of delineating alliance versus national roles and responsibilities.

Nobody instilled a spirit of cooperation better than Gen Gregory "Speedy" Martin, USAFE commander, pictured with a pilot from the 555th Fighter Squadron.

Indeed, roles and responsibilities were precisely the focus of the first meeting conducted at AIRNORTH on 6 August 2002, which dealt with the question of organizing air defenses for the Prague summit. The participants established initial ground rules critical to effective planning and assessments on the part of the three primary parties involved: AIRNORTH, the CZAF, and USAFE. AIRNORTH would ensure the reinforcement of NATINADS and see that it maintained surveillance and situational awareness, not only within the Czech Republic but also throughout central Europe. The Czechs and Americans would work out arrangements for orchestrating "national" fighter support and the attendant requirements of fighter C2. Bilateral discussions to this end opened in Prague between Czech and US Airmen on 20 August, before the summer's floodwaters receded.[5]

UTASC planners quickly determined that USAFE could certainly support the Czechs if necessary. That optimism, however, was tempered by the knowledge that a number of important issues had to be resolved before completion of an effective operations plan. Fortunately, the CZAF and USAFE agreed completely on the issues and maintained an effective dialogue to tackle each in turn. Both parties had to work out a plethora of details, but the most important concerns fell into five general areas:

- *A clearly defined mission statement*. Such a statement was central to the effective development of a plan and the successful resolution of every other issue on the table.
- *Forces required and basing*. The two countries needed to know the number of CAPs required throughout the summit; their location; the kind of aerial-refueling support for US fighters; and basing arrangements that offered the greatest flexibility and lowest adverse impact.
- *C2*. Having a senior US commander involved in any decision to use a US fighter to engage an aircraft over the Czech Republic raised certain questions: who would produce the ROEs and air tasking order (ATO), and could the countries develop effective measures to prevent "blue-on-blue" engagements, especially between weapons systems designed by two former Cold War competitors without much collective experience in combined operations?
- *Effective communications*. The two parties also needed to know the kind of air-surveillance picture that senior decision makers would have to deal with; the security, reliability, and redundancy of the lines of communication among radar sites, NATO AWACS aircraft, and the Czech Air Defense National Command Center (NCC); and the people who would "talk" to US fighters aloft and direct their actions.
- *Dealing with every contingency imaginable*. Finally, US and Czech personnel had to consider the options available for coping with central European weather in November, which was far from ideal for air operations; defensive weaknesses that a determined terrorist might exploit; and the consequences of making a wrong decision with respect to engagement.

By the third week of September, nearly all the issues had some form of proposed resolution, and a draft operations plan had been sketched out as part of a combined AIRNORTH-CZAF-USAFE planning-group effort led by Maj Anthony Roberson, chief "master air attack planner" from the UTASC's 32d Air Operations Group. Although questions continued to arise right up to the time the summit began, the essentials of the plan changed little from that point until actual execution two months later. Providing continuous fighter CAPs over Czech territory, the plan called for the deployment of F-16CGs from the 555th Fighter Squadron, the "Triple Nickel," at Aviano AB, Italy, to Caslav—a Czech fighter base about 45 miles southeast of Prague—where their hosts would also operate MiG-21s and L-159s as part of summit operations. Detailed weather analysis sug-

gested that low cloud ceilings and fog might keep Caslav fighters grounded for significant periods of time; thus, to give senior decision makers every possible edge in determining the intentions of suspect aircraft, the force would include fighters from outside the Czech Republic—specifically, F-15Cs from the 493d Fighter Squadron "Grim Reapers" at Royal Air Force (RAF) Lakenheath, United Kingdom. To keep the American fighters aloft for extended periods of time, KC-135R tankers from the 100th Aerial Refueling Wing at RAF Mildenhall would be sent to Rhein-Main AB, Germany (Frankfurt International Airport), where the combination of US base support; long, instrumented runways; and relative proximity to Prague offered significant advantages. A tanker would also remain in alert status back at RAF Mildenhall just in case Frankfurt's weather proved uncooperative.

US F-16 and Czech MiG-21 pilots provided effective defense against potential air terrorists during the Prague NATO summit.

Of course, the small air armada assembled for the effort would need effective C2. AIRNORTH would generate the ATO, capturing in a single reference document all assets dedicated to the defense of the summit, including those based outside the Czech Republic. NATO's ROEs would remain in effect up to the point at which the Czechs desired to transfer authority from the NATINADS to the CZAF during the process of investigating a suspected air terrorist. Taking advantage of recent experience in dealing with air terrorists over the United States, USAFE and the CZAF came to an early agreement on the framework for the ROEs after that transfer took place. NATO's CAOC four (CAOC-4), located in Messtetten in southern Germany, would organize the NATINADS to respond to summit threats. NATO AWACS aircraft would remain aloft continuously, based at two locations as a precaution against bad weather, and would have their own dedicated KC-135R tankers (US Air National Guard, assigned by NATO) collocated at Geilenkirchen AB in northern Germany.

These AWACS aircraft would serve primarily as a sensor to fill in gaps in ground-based radar coverage at low altitude. After a transfer of authority to the Czechs, AWACS and CAOC-4 would not perform any C2 functions with respect to an engagement over Czech territory; rather, those would take place in Stara Boreslav at the NCC, an underground facility located just outside Prague near the CZAF headquarters. Normally, the NCC operated within the NATINADS as a control and reporting center that reported to CAOC-4, an arrangement which simplified the mechanics of a transfer of authority. Senior decision makers from USAFE and the Czech defense establishment would sit side by side, comfortably situated in a bunker complex built in the 1970s to withstand an attack by NATO, assessing the same picture and determining an appropriate course of action. If Czech fighters or SAMs were employed, the United States would merely monitor the situation, but if an F-16 or F-15 were in the best position to intercept a potential terrorist, then the senior US officer present would become involved before approval of the engagement.[6]

Stara Boreslav offered much to enhance air defense of the summit. In 1998 US defense contractor Lockheed Martin installed in the NCC a state-of-the-art digital system

that fused data from the NATINADS as well as from Czech ground-based radars and SAMs into full-color graphic displays. These images appeared on large screens and individual consoles in a well-equipped operations room whose layout proved particularly well suited to the proposed plan. One location housed every element of the combined Czech-US air arsenal, under the watchful eye of decision makers and controllers responsible for execution: surveillance teams, SAM-battery directors, weapons directors who talked to the fighters, and air-battle managers who pulled it all together. Significantly, having all the key C2 players in one spot greatly reduced the possibility of fratricide.

The way the Czechs organized the NCC floor proved fundamental to the ultimate success of the bilateral operation after Czech and US teaming became a feature of every key position in the NCC (with the exception of SAM direction—exclusively a Czech domain). When USAFE planners first looked at the facility, they swiftly resolved the question of who would talk to the US fighters. Weapons directors/technicians from the 606th Air Control Squadron "Scorpions" at Spangdahlem AB, Germany, would deploy to Stara Boreslav itself and sit beside their Czech counterparts, who directed the MiGs, L-159s, and other Czech military aircraft.

It all looked good on paper, but the Americans and Czechs had to address two essential requirements before executing the plan. Thus far, USAFE had been tasked only to "plan" for supporting the Czechs. Actual execution required approval by the secretary of defense and consent of the president. Approval by both the secretary and the Czech defense minister raised the second requirement—a convincing demonstration that it could work. On 23 September, after General Martin outlined the proposed plan to General Ralston in Stuttgart, Germany, both commanders flew that same afternoon to Warsaw, Poland, where they met with Secretary of Defense Donald Rumsfeld, who was attending a conference of NATO defense ministers. Secretary Rumsfeld was very familiar with the issues and risks associated with counterterrorist air-defense operations, having become intimately involved in Noble Eagle from its inception a year before. He directed USEUCOM to continue planning and prepare for a return visit as soon as the operations plan was fully developed. This requirement generated a series of team training events and exercises to produce the kind of fidelity necessary for the confident risk assessment the secretary had to contemplate if the United States were to participate in summit air operations.[7]

In fact, the CZAF, AIRNORTH, and USAFE had already devoted much thought to this process. At the urging of Lt Gen Glen "Wally" Moorhead, USAFE vice-commander, the principals sought the assistance of USAFE's Warrior Preparation Center (WPC)—a joint Air Force/Army organization located not far from Ramstein. A former WPC commander, General Moorhead knew that the WPC already had the means to plug into the UTASC in support of crisis/contingency operations. The center, which conducted war-gaming and operational assessments on behalf of USEUCOM, had an abundance of experienced "warriors" who understood how to test a war-fighting organization and, in the process, enable it to reshape itself in terms of tactics, techniques, and procedures. Air Force colonel Tony Rock, WPC vice-commander, put his best minds on the project, and a three-phase plan for air-defense training and exercising soon emerged.

Of course this effort required close coordination with NATO since AIRNORTH had plans to conduct some form of exercise in preparation for the summit. Thus, the WPC worked in conjunction with the AIRNORTH tactical evaluation (TacEval) office of Lt Col Wolfgang Moser of the Luftwaffe. Colonel Moser and Maj Patrick Matthews, Colonel Rock's project officer, produced an exhaustive series of scenarios designed to test every potential vulnerability of the plan developed for the summit. During the first week of October, the WPC and AIRNORTH TacEval facilitated a daylong roundtable session conducted at Stara Boreslav involving key players from AIRNORTH, the CZAF, and USAFE, which helped address some

unanswered questions and led to certain refinements in the operations plan. It also served as an introduction to personnel who would play leading roles in the plan's execution.

What really made a difference, however, was the manner in which personnel conducted the second phase of the WPC/AIRNORTH TacEval preparation program. The Czechs planned to conduct a full-blown simulation—a command-post exercise (CPX)—in the NCC at least one month prior to the summit. The NCC's operations-room facilities, modernized in 1998, now offered a rare opportunity for realism: technicians directed behind the scenes by Colonel Moser and Major Matthews could display and manipulate synthetic renegade aircraft, fighters, and tankers at will. From the perspective of decision makers and controllers in the operations room, for all practical purposes the displays depicted real events unfolding in real time.[8] On 16 October, General Martin and Lt Gen Frantisek Padelek, CZAF chief of staff, presided over a series of NCC simulations designed to exercise air-battle managers and weapons directors from both air forces. Czech defense minister Jaroslav Tvrdik and his deputy, Mr. Stephan Fule, attended as well. Unfortunately, the results were disappointing.

First, the information presented to senior decision makers on the NCC's displays did not make sense to individuals who did not have to interpret it daily. Second, although the Czechs maintained a firm grasp on controlling their own assets, it soon became clear that they were still grappling with US/NATO air-battle-management practices developed over decades of mutual cooperation. The CZAF, which had less than four years of NATO indoctrination to fall back on, had never conducted an air-defense exercise of this kind and scope. Practices that USAF weapons directors took for granted, such as cycling fighters across tankers and establishing backup CAPs when one set of fighters committed to a target, were somewhat novel to the Czechs. Finally, not every key player in the NCC's C2 process had exactly the same situational awareness and understanding of the actions directed, a problem primarily caused by language and procedural differences between US and Czech air-battle managers. In accordance with standard NATO procedure, the Czechs spoke English, but in the heat of simulated battle, they tended to fall back on their native tongue and familiar practices. Failure to resolve this last issue quickly and effectively would have spelled disaster for the plan.[9]

At this point it is appropriate to comment on the personal working relationships and sense of trust that developed among the key players involved in the planning effort from AIRNORTH, the CZAF, and USAFE. American military professionals have a natural tendency to demonstrate leadership in a combined planning effort such as the one undertaken for air defense of the summit. In our enthusiasm to "do the right thing," however, we have frequently been guilty of not giving our alliance partners full credit for the effectiveness of their own tactics, techniques, and procedures. USAFE worked very hard at ensuring that AIRNORTH and the CZAF understood that the US command was not trying to take over the operation, carefully explaining recommendations to allow each party to arrive at its own conclusion. Although USAFE felt it had much to offer the CZAF, learning was not a one-way street. Through dealing with the challenges of the global war on terrorism, the Czechs had proven themselves world leaders in consequence management. Their method of integrating air-defense C2 within the NCC made a great deal of sense, putting everything needed into one neat package in a single room. Nobody instilled the right sense of team building for this effort better than General Martin, who at the end of the day charged the AIRNORTH/CZAF/USAFE team with resolving the difficulties encountered on 16 October as soon as possible. Three days later, he would return to participate in another set of NCC simulations, followed that same day by a live-flying exercise.

The NCC put those next two days to good use. Since the simulations had proven their worth at wringing out key C2 issues that needed

resolution, the team subjected itself to a regimen of computer-generated scenarios, providing an opportunity for full development of US-Czech teaming. During the CPX, the two nations had sat side by side in the NCC only at the most senior level (General Martin and General Padelek) and the lowest level (weapons directors who orchestrated air-defense fighter activities). Now, US weapons directors/mission coordinators sat with their Czech counterparts at every key position in the NCC, excluding those that dealt exclusively with SAM C2. This arrangement facilitated information flow and situational awareness for all concerned, enabling air-battle managers of the 606th Air Control Squadron to pass on the benefits of their wealth of experience more directly to intermediate-level CZAF decision makers. This hands-on training was like nothing attempted before with a new NATO partner in terms of duration, intensity, and motivation. Everybody involved was motivated by the knowledge that this was no mere training exercise—that the plan had to work if the summit were to enjoy the kind of robust air defense it deserved.

Defense Minister Tvrdik and General Padelek joined General Martin again at the NCC on 19 October for a full-blown dress rehearsal of planned summit air-defense operations. The day started with a convincing demonstration that the team had conquered the difficulties encountered on 16 October. The response to scenarios like those used in the CPX clearly indicated that the Czech-US teaming approach and the simulation drills had paid off handsomely. Following that "warm-up," the CZAF took to the air over the Czech Republic along with Aviano-based F-16s, Mildenhall KC-135s, and NATO AWACS aircraft from Geilenkirchen. A CZAF Tupolev Tu-154 airliner and light trainer aircraft were put to use as "targets" to provide an added dimension of realism to the live exercise, enabling full validation of the connectivity between CAOC-4 and the NCC as well as communications between aircraft and controlling agencies. The rehearsal demonstrated effective handoff measures by flying the Tu-154 target into Germany, where Luftwaffe F-4F Phantoms intercepted the aircraft and then escorted it back to the Czech border, where CZAF MiGs took over. Most importantly, the live flying served as a final exam of sorts, proving that the concepts developed over the weeks of planning and preparation did indeed work.

That said, more work remained, including modifications to the NCC's displayed data to enhance user-friendliness, as well as installation of additional secure communications and backup data links over the next few weeks. At the end of the day, though, General Martin believed he could report to Secretary Rumsfeld that USAFE was prepared to conduct operations in support of the summit if so tasked—precisely the assessment delivered to the secretary in the Pentagon four days later. After listening to General Martin's briefing on the results of the prior week's exercises, he was satisfied with the thorough planning that had gone into the entire effort and gave his approval for USAFE to support the CZAF in providing air defense of the Prague summit. Shortly thereafter, the Joint Staff prepared an execution order that put the final phase of preparation into motion.[10]

From this point on, the project would be known in US channels as Operation Summit CAP. The senior US decision makers in the NCC for the actual operation would include General Martin himself and Maj Gen Charles "Chuck" Simpson, USAFE director of operations. Czech senior decision makers resident in the NCC would include General Padelek and Brig Gen Emil Pupis, a CZAF officer assigned to the Czech General Staff and a recent (2000) graduate of the USAF Air War College. The tasked forces deployed from USAFE: personnel from the 606th Air Control Squadron arrived a week prior to the summit to hone C2 teaming through more NCC simulations; on 18 November, 555th Fighter Squadron fighters landed at Caslav AB to establish operations there, and the 100th Air Refueling Wing relocated seven tankers to the parking ramp at Rhein-Main AB; F-15Cs from the 493d Fighter Squadron were armed and placed in readiness at RAF Lakenheath; and NATO AWACS aircraft took to the air to aug-

ment the picture provided by ground-based radars as USAFE and CZAF forces went into place. The two-day summit would officially begin on the 21st, but everything was ready to go well ahead of the opening session.

*The 555th Fighter Squadron deployed F-16s to Caslav AB to join Czech MiG-21s (*right*) and L-159s (*center*), along with F-15s based in the United Kingdom, to provide combat air patrols in support of Operation Summit CAP.*

Execution

As the host of dignitaries attending the summit began to arrive on 20 November, Secretary Rumsfeld and Gen Richard Myers, chairman of the Joint Chiefs of Staff, paid a visit to Stara Boreslav to witness firsthand what the combined air-defense effort had accomplished. Everything had gone into motion exactly as briefed to the secretary a month before. The NCC's computer-generated displays were alive with commercial-airline traffic under the watchful eye of NATO sensors, while fighters and tankers aloft were ready to respond at a moment's notice. Secretary Rumsfeld and General Myers spoke at length with Czech and US controllers, who expressed confidence and enthusiasm regarding the task before them. They departed the NCC satisfied with what they had seen and turned their focus to the important events ahead of them in downtown Prague.

Within hours of their departure, the moment of truth arrived. On the afternoon of the 20th, a Tupolev Tu-154 airliner originating from central Asia announced its intention to land at Prague's Ruzyne International Airport as it crossed the southern Czech border. The Czechs had placed tight controls on granting permission for aircraft to land at Ruzyne during the time frame of the summit. This aircraft was not a regularly scheduled commercial flight; neither was it on the list of approved missions cleared into Prague for the summit. To make matters worse, the aircrew failed to comply with some of the instructions issued by Czech civil air-traffic controllers as they tried to alter its course while deciding what to do with it. This failure could have resulted from communications difficulties, or—in the minds of the people responsible for protecting the summit—it could have had more sinister implications. Because nobody in the NCC wanted to take any chances, controllers vectored a flight of F-16s to rendezvous with the Tu-154, escorting it to a safe recovery at Pardubice AB, well outside Prague. There, authorities learned that the Kazakh minister of defense was on board and that his ministry had failed to apply for the appropriate diplomatic clearances prior to his plane's departure. Within an hour of its arrival at Pardubice and following completion of the necessary arrangements, the Tu-154 was allowed to proceed to Ruzyne.[11]

The Czech-US team members remained composed and deliberate during the incident, and everything worked precisely as they

Secretary of Defense Donald Rumsfeld meets Lt Gen Frantisek Padelek, chief of the Czech air force, outside the National Command Center at Stara Boreslav. Defense Minister Jaroslav Tvrdik stands beside Secretary Rumsfeld.

had practiced during simulations and the live-fly exercise. The team scrambled another F-16 CAP to replace the flight that escorted the Tu-154 through Czech airspace, repositioned a tanker to accommodate the escort flight, and postured F-15Cs and MiG-21s to intercept any other suspicious aircraft throughout the duration of the incident. It was almost as if AIRNORTH TacEval and the WPC had arranged the whole scenario. In fact, as soon as the Tupolev parked at Ruzyne, the entire NCC team, including General Martin and General Padelek, conducted a brief after-action review very similar to those held during the simulations and live-fly exercise. This procedure served to reinforce success, just as it had during the workup events.

Three other times during the summit, the team dispatched fighters (alternating between MiG-21s and F-15Cs) to observe suspicious aircraft from a safe distance. The outcome again validated the effectiveness of the C2 arrangements put into place at the NCC. Just as importantly, if not more so, other arrangements were vindicated as well—specifically those adopted in the event bad weather restricted operations. Low ceilings and persistent fog kept the F-16s, MiG-21s, and L-159s on the ground at Caslav for more than half of the summit's duration, but Lakenheath's Grim Reapers maintained a constant presence in the meantime. Backup KC-135s at Rhein-Main provided the additional fuel needed by the F-15Cs. Similarly, the two bases used for NATO AWACS aircraft endured bad weather that periodically shut down operations at one location or the other. At the summit's conclusion, General Martin noted that the most significant lesson in execution was the value of sound contingency plans, such as those used in case of adverse weather, and the need to commit the necessary forces to support those procedures up front—as early in planning as possible.[12]

Conclusions

Operation Summit CAP provided convincing evidence that NATO could meet the challenges posed by international terrorism and

President George Bush arrives in Prague for the NATO summit.

could do so with its newest members playing a prominent role. It was all the more fitting that this particular effort occurred in support of a meeting in which NATO heads of state charted a new course for dealing with evolving threats to the alliance and agreed to accept new members into the fold. AIRNORTH, USAFE, and the CZAF had used legacy NATO and Warsaw Pact weapons systems in an air-defense structure that had proven its worth during the Cold War, and in a manner that proved very adaptable to the global war on terrorism. Summit CAP could not afford to fail—not only in terms of preventing a catastrophe delivered at the hands of terrorists, but also as a test of the alliance's enduring relevance.

Some critics might argue that NATO did not fully meet the requirements of protecting the summit, pointing out that the Czechs had to turn to the United States to provide additional air-defense fighters. To do so misses a key point. Although their choice had certain political motivations, the Czechs could have asked any one of a number of other NATO members for assistance—the United Kingdom, Germany, and Italy all had capabilities essential to the task. In this situation, having only one other nation involved in executing a Czech sovereign decision to engage a civil aircraft over its own territory simplified C2 arrangements tremendously. Given the nature of this decision and the risk it implied for innocent civilians, one cannot over-

state the need for less complexity and more clarity in its execution. Involving only one other member nation in engaging a terrorist aircraft made common sense.

It may have made sense, but it certainly wasn't easy. No one had ever attempted a bilateral air-defense arrangement like this one. The fact that it played out successfully in a relatively short time with a new member of the alliance speaks volumes for the value of commonality in NATO tactics, techniques, and procedures, which provided the framework essential to preparing USAFE and CZAF forces to work together, using weapons systems that only 13 years before they had arrayed against each another. The task would have proven far more difficult had the Czechs not upgraded their NCC facility so that it could easily accommodate the structure of NATO air-defense practices developed by the alliance after decades of hard work and determination. Not only did personnel from AIRNORTH, USAFE, and the CZAF have to work effectively within the confines of Stara Boreslav, but also information needed to pass with speed and accuracy between CAOC-4 and the NCC to afford the summit the added measure of security NATO offered outside Czech boundaries. During the operation, Stara Boreslav proved beyond question that it was a viable node in the NATINADS network.

But questions surfaced concerning its viability when AIRNORTH, USAFE, and the CZAF first set about planning the operation less than four months before its execution. Communications and data links between CAOC-4 and the NCC had never undergone severe strain prior to the workup to the summit. The Czechs, still new to the alliance, had not fully integrated themselves into its practices, a fact made clear when controllers in the NCC first confronted air-battle-management practices familiar to NATO for years. But the program of preparation undertaken by AIRNORTH and USAFE in the tabletop seminar, CPX simulations, and the live-fly exercise of 19 October enabled unprecedented acceleration of the integration process. After all, a great deal more was at stake in this effort than in an exercise not tied to an event of the summit's magnitude. Operation Summit CAP now served as an example of what was possible. As General Martin related in his preliminary observations after the fact, "After nearly three years of immersion in the process of NATO integration, I believe this kind of focused, cooperative effort with our new NATO members gets results."[13]

We should continue to pay attention to future NATO air-defense operations for the purpose of supporting high-profile events as well as ensuring the daily security of its member nations. In addition to revealing the possible, Summit CAP uncovered issues that deserve further development. In retrospect, more direct involvement of civil agencies in operational planning and exercising would have reduced the number of questions that passed between the NCC and Prague's air traffic control center during the summit. The same sense of trust between NATO partners needs fostering at the most senior levels if the alliance wishes to effectively pursue high-risk operations of this kind in the future; trust can develop through the direct participation of senior leaders involved in such operations from their inception. Will the new NATO Response Force be able to contribute a member nation's air-defense fighters to a cooperative venture of this kind in the future, especially in support of new member nations that, like the Czech Republic, lack a full complement of air-defense assets? One hopes that it can since the United States can ill afford to augment the forces needed to protect every summit or conference attended by allied dignitaries.

On the evening of 21 November, NATO's heads of state dined in grand style, hosted by President Vaclav Havel in Prague Castle. Sitting prominently atop a hill overlooking the city, the castle complex was brilliantly floodlit, a nightly custom. No place within the Czech Republic shone more brightly that night. The streets below the castle were eerily quiet, most citizens respecting their government's recommendation that they stay at home after work during the two days of the summit. A persistent drizzle and mist would have complicated

matters for a would-be air terrorist in search of such an otherwise easy target, but something else would have provided much more formidable resistance on that peaceful evening. High above the castle, distant but distinct nonetheless, the unrelenting drone of two F-15Cs from the Grim Reapers could be heard, flying watch over the Czech capital and proving that the alliance could confidently pursue its collective interests in an uncertain world. □

Notes

1. Article 5 of the North Atlantic Treaty, 4 April 1949, protects national rights with respect to self-defense.
2. Meeting, Jaroslav Tvrdik, Czech defense minister; Lt Gen Frantisek Padelek, CZAF commander in chief; and Gen Gregory Martin, AIRNORTH and USAFE commander, Ceske Budejovice, Czech Republic, 31 August 2002.
3. Comments by Craig Stapleton, US ambassador to the Czech Republic, to Col Marc Neifert, US defense attaché, Prague, Czech Republic, August 2002.
4. Message, 061219Z, US mission to NATO, to US secretary of state/secretary of defense, 6 August 2002.
5. Report, "Results of 6 August AIRNORTH Meeting," USAFE TASC/CV, to USAFE commander (COMUSAFE), 7 August 2003.
6. Concept of operations briefing, 32d Air Operations Group, subject: Prague Summit Air Defense, 20 September 2002.
7. Briefing, COMUSAFE to SECDEF, subject: NATO Summit—US Air Support, Warsaw, Poland, 23 September 2002.
8. USAFE Warrior Preparation Center, "Red Team Playbook," 3 October 2002.
9. Col Anthony Rock, vice-commander, Warrior Preparation Center, to COMUSAFE, memorandum, 24 October 2002.
10. Briefing, COMUSAFE to SECDEF, Office of the Secretary of Defense, Washington, DC, subject: Operation Summit CAP, 23 October 2002.
11. CTK Czech News Service, "US Fighters Force Kazakh Defense Minister to Land," 21 November 2002.
12. Message, 222101Z, COMUSAFE to commander, USEUCOM, 22 November 2002.
13. Ibid.

Boydmania

DR. DAVID R. METS*

Out flew the web and floated wide;
The mirror crack'd from side to side;
"The curse is come upon me," cried
The Lady of Shalott.

—Alfred, Lord Tennyson

PITY THIS POOR reviewer! Idiots rush in where apostles fear to tread. In response to another reviewer who took issue with his view of Col John Boyd and the latter's acolytes, Robert Coram writes, "As the author of seven novels and three nonfiction books, I know better than most the truth of the axiom, 'A book is like a mirror. If an idiot looks in, you cannot expect an apostle to look out.' "[1] Here I reject the company of the apostles and rush in to review Coram's book *Boyd: The Fighter Pilot Who Changed the Art of War*.[2]

The 10 books Coram offers as his credentials for expert status on airpower and war include three novels on drug smuggling; four

*Everything in this article is my own responsibility; in no way does it represent the attitudes of Air University, the US Air Force, or the Department of Defense. Regarding the verses in the epigraph, Charles Tennyson, the poet's grandson, said that they depict a lady who lives in an imaginary web as she peers in her mirror, knowing that if she leaves her chambers for the real world she will come under a curse that will be her end—the self-absorbed person cannot survive engagement with the real world. *Alfred Tennyson* (New York: Macmillan, 1949), 132.

police novels set in Atlanta; and nonfiction works on Antigua, on an Irish woman of Saigon, and on fishing. Indeed, he has a fine writing style, honed during his long experience as a teacher of writing at Emory University and demonstrated in a sensitive essay about prostate cancer on his own Web site.[3] He describes his original motivator:

> [Ralph] McGill's writing and Daddy's reaction showed me the power of words and caused a dream to stir in my breast. I was still in elementary school when I resolved that one day I would go up to Atlanta and write for the *Atlanta Constitution*. This was a lofty dream for a country boy. But for me and, I suppose, for hundreds of other young people in small towns around Georgia, Atlanta was a mythical place where anything could happen, a place where dreams can come true. From as far back as I can remember, Atlanta and the Atlanta newspapers were one and the same to me.[4]

I know that I am virtually alone looking into the mirror and coming away with a negative view. Coram proclaims on his Web site that he is practically buried in glowing reviews of the Boyd book. He is right. Seldom is heard a discouraging word in the dozens of reviews there. Is it possible that I am alone in my idiocy and that dozens of journalists are right? Or could it be that Coram's prominence in the world of journalism results in reviews that constitute taking care of one's own? Or could it be that the periodical reviewers value writing style above substance—perhaps very few of them have any expertise in airpower and war anyhow?[5] Or could it be only the power of the publisher's marketing machine? Woe is me; when I gaze into the mirror that is Coram's book, I see many impressive things. But I don't see anything at all in the way of experience, education, or research and writing that would yield expertise on either war or airpower. Perhaps it is only another "mirror crack'd" wherein the imagination runs wild.

The book's subtitle, *The Fighter Pilot Who Changed the Art of War*, is neither the last nor the most extreme of the wild superlatives, undocumented assertions, or purple prose one finds between its covers. One of the grossest examples occurs on page 74, where Coram declares (without a footnote) that "inside flight ops [at Nellis AFB, Nevada], as the [fighter] pilot filled out the paperwork, bomber pilots or transport pilots looked over and saw the [Fighter Weapons School] patch and the black and gold checkerboard scarf and their manhood shriveled." I spent more time on flying status than did John Boyd—briefly as a "light bomber pilot" and later as a transport pilot—but I never noticed that phenomenon. In fact, since the last time this light bomber pilot filed out of Nellis flight ops, he has fathered three more children. Coram's naïve acceptance of foolish aircrew banter alone is enough to disqualify his book as a serious study. But let us note one more example: "This all boils down to one thing: Marines are utterly contemptuous of the Air Force."[6] That statement is insulting to both the Marine Corps and the Air Force. Upon his recent retirement, an Air Force colonel—one of my most distinguished colleagues at Air University—was hired to teach at Marine Corps University at Quantico, Virginia. And this is only one of the many instances of the mutual respect that exists between the two services.[7]

Coram and Boyd's other biographer, Dr. Grant Hammond, the object of the former's angry defense cited above, share a number of traits.[8] Both of their books are hagiographies although Hammond's is less extreme, and its author, who actually knew Boyd, has more background in the airpower world as a professor at the Air War College. Both seem to indulge in the common literary device of increasing the sales appeal of their stories to editors and customers by setting up a David (Boyd and his acolytes) to slay the Goliath (the Air Force establishment and numerous *unnamed* careerist generals). Nobody ever got rich by saying the US government did a pretty good job. Hammond, for example, has been known to appear first in the postwar markets with such pieces as "Myths of the Gulf War" that focus on what Goliath did wrong.[9] I therefore use the same technique to discuss the "myths about John Boyd, his acolytes, and

the military 'reform' movement" of a quarter century ago.[10] (Don't get me wrong. Anyone who can survive many years of flying in the F-86 and F-100, including ejections, cannot be all bad. What I see in the mirror crack'd has less to do with Boyd himself than with his biographers and acolytes.)

Myth One:

Boyd was born into a deprived situation but still managed to beat the odds.

Biographers and acolytes make much of this assertion. However, I believe that, to a man, they themselves are the products of privileged postwar environments and that they make their judgments without considering the context of young John Boyd's (born in 1927) own youth. Coram (born about 1938), Hammond (younger than that), and most of the acolytes are too young to remember the Great Depression years or even the wartime era during which John Boyd grew up. Furthermore, as Walter Kross points out, the combat experience of advocates of the "reform" movement (many of them Boyd acolytes) was "virtually nil."[11]

Coram titles the chapter on Boyd's youth "Haunted Beginnings." To be sure, his family did have its hardships—even tragedies—and that may look like deprivation to modern-day professors and journalists in the context of the affluent twenty-first century. But it was not at all rare in the context of the Depression and World War II. In fact, millions of young boys would have looked upon a family as wealthy if it owned a single-family home as well as an automobile and could afford to allow a son to spend his high school years lettering in two sports instead of working more to help out—as was the case in the Boyd household. But perhaps the biographers and acolytes had to overstate the case to make the apparent odds in favor of Goliath even greater than they were.

Myth Two:

Biographers and many acolytes declare that the Air Force establishment was prejudiced against Boyd, stacking the deck against him and denying him promotion to general officer.

John Boyd received his commission in 1952 at the time he graduated with a bachelor's degree in business from the University of Iowa. He eventually became a full colonel. Senior journalists, acolytes, and professors may look upon that fact as a failure or disgrace; if so, they peer out at the world from an ivory tower. One need only use the class of 1952 at West Point—certainly a group whose starting prospects were below neither the Army nor the Air Force average—as a baseline against which to measure Boyd's achievement. Of the 527 graduates, 339 (64%) did *not* make it as far as full colonel. Many of them had graduate degrees and intermediate- and senior-level professional military education—Boyd never did. Upon their commissioning as second lieutenants, all of them knew calculus and thermodynamics; Boyd did not get into that world until he was a senior captain, close to a decade later. Many of them had more combat and operational-unit command experience than did Boyd.[12] Yet, John Boyd went further than almost two-thirds of the US Military Academy class of 1952. In fact, only 34 (less than 7 percent) of the 527 made general officer. In other words, even without the starting-line benefits of an engineering degree and an academy education, Boyd did as well as or better than 93 percent of the West Pointers.[13]

It appears to me that both Coram and Hammond have a serious flaw in their view of the military world. Maybe, as Coram hints, it indeed would be more accurate to suggest that without Goliath's tolerant hand reaching out to Boyd, he would not have made colonel. But wait, wait—Abraham Lincoln, perhaps the greatest strategist in American history, also did not go to West Point and certainly

never got an engineering degree. If a rail-splitter from Illinois can reach such lofty heights, why can't a business major from Iowa change the art of war?

Myth Three:

Boyd asserts (as do his acolytes) that he overcame the Neanderthal Air Force establishment to bring about large numbers of low-cost, lightweight, very agile fighters that repaired the service's defects during the Vietnam era. He thus established the long day of US air dominance with the gun-armed F-16.

This myth includes a number of corollaries:

- John Boyd was instrumental in bringing about the F-15, but Goliath corrupted the aircraft by adding extras that made it too heavy.
- Strategic Air Command (SAC) and its commander, Gen Curtis LeMay, denied the gun weapon to Vietnam-era fighters.
- SAC and LeMay imposed missiles on fighter pilots.
- The Vietnam air war proves that Goliath had lost the lessons of Korea in that the missile-armed fighters used in Southeast Asia lacked agility and rearward visibility, were too big, and smoked too much, all of which resulted in poor performance and the near loss of air superiority.[14]
- Those problems, together with the timid Goliaths who served as colonels in the 1950s, denied true fighter pilots the realistic training in dogfighting they needed to conquer the North Vietnamese air force.
- The Communists were smarter than our Goliaths because they invented the small, light, and very agile MiGs.
- The huge F-111 was the ultimate expression of the ignorance of the Goliaths, who were determined to gold-plate everything and turn even the F-15 into an Aardvark (F-111) clone.
- SAC leadership of the 1950s was responsible for the failure of the F-105, designed for high-speed nuclear delivery, in the guerrilla war in Vietnam.
- The Navy, in all its wisdom, came up with the A-1E Skyraider—far superior to the F-105 for the air war in Vietnam. Taking note of this development, Boyd acolyte Pierre Sprey developed the purpose-designed A-10 (which the Air Force has tried to decommission ever since)—notwithstanding the fact that the Skyraider was designed for torpedo attack at sea rather than close air support (CAS).

In the 1970s, Boyd and his acolytes prophesied doom for the United States due to the errors of the Goliaths in charge of the Air Force. Many in Boyd's coterie have weighed in with glowing reviews of Coram's book and continue cultivating the martyrdom of John Boyd—but with precious little attention to the history that has happened *since* Vietnam.[15]

How did it come out? Did the great dogfighting ability of the agile F-15 and F-16 rescue us from doom? I doubt it. As of this writing, Air Force F-15s, the demons of the acolytes, *had* killed 39 targets—*all* of them with air-to-air missiles. Air Force F-16s *have* killed seven—*none* of them with the fine M-61 gun. In fact, the Viper has seen its effectiveness greatly enhanced by the addition of the advanced medium-range air-to-air missile (AMRAAM), which gives most F-16s a beyond-visual-range (BVR) capability for the first time. The F-16 has used this missile for some of its kills—the rest have been with the updated Sidewinder, not nearly as dependent on the agility it used to require in Vietnam because it now has a near-all-aspect capability. So far, the Korea-style dogfight seems to have all but disappeared from the air-to-air battle. The agility of both aircraft remains highly useful in dodging surface-to-air missiles, but that is not what

Boyd and the acolytes had in mind. But wait! The "reformers," appalled by the excessive sophistication of the F-15, did succeed in obtaining the cheaper and simpler F-16 rather than the two-engine F-17 (which later evolved into the Navy's F-18).[16] What of it?

As of this writing, although we have lost neither an F-15 nor an F-16 in air-to-air combat, some have succumbed to accidents. By the end of fiscal year 2001, 100 F-15s had been destroyed in accidents that cost 37 pilots their lives—compared to 272 F-16s written off and 73 pilots killed. True, the F-16 has flown more hours than the F-15, but the number of aircraft destroyed and pilots killed is disproportionately higher in the Viper.[17] Neither the Navy nor any surviving light-bomber pilot ever thought of that second engine as superfluous; without a doubt, a number of F-15s came home on the extra power plant. When the Viper loses its engine, the whole bird (and sometimes the pilot) usually goes with it.

One of the corollaries has to do with the guns-versus-missile argument. General LeMay and SAC are blamed for denying guns to Vietnam-era Air Force fighters and imposing missiles on their reluctant pilots. How has that come out? In the first place, as noted, the F-15s and F-16s in service have 46 kills—*all* of them with missiles. The Air Force has had exactly two gun kills since the F-16 came on the line—both of them against helicopters shot down by the A-10's 30 mm GAU-8, a gun specifically designed to kill tanks![18]

A further defect in this myth maintains that Goliath (specifically, General LeMay and SAC) denied guns to the F-4C and F-4D. Nonsense. LeMay gets the blame, if that is the word, that really belongs to Secretary of Defense Robert S. McNamara. The Navy designed the F-4 (for fleet defense against nonmaneuvering bombers) and never included a gun in its models. The Air Force attempted to have an internal gun installed, but Secretary McNamara denied that change until combat in Southeast Asia demonstrated the need. At that point emerged the F-4E and its internal M-61 20 mm Gatling gun.[19]

Col Robert Ackerly greets Secretary of Defense Robert S. McNamara during a 1966 visit to Bien Hoa Air Base, South Vietnam. Lt Gen Nguyen Huu Co accompanied Secretary McNamara during his visit.

Gen John J. Burns, a man with impeccable fighter-pilot credentials antedating any of those belonging to members of the "Fighter Mafia," enthusiastically endorsed missiles—especially the BVR variety. This inclination largely accounted for his skepticism about the lightweight fighter. As it stood at the time, because the F-16 did not have a sufficient radar for semiactive AIM-7s, it could usually fire on an enemy only from the rear quadrant—whereas an enemy with a radar missile could shoot one in the face of the F-16 pilot. Since World War I, the plane taking the first shot has a rather pronounced tendency to win.[20]

As noted, not until the AMRAAM got its initial operational capability in the early 1990s did the Viper acquire a BVR weapon—itself a "high-tech" answer. General Burns's attitude is neither new nor limited to senior officers.[21] From the beginning, one could find in the *Fighter Weapons Newsletter* of the late 1950s great enthusiasm for the new missiles among junior fighter pilots. For example, Capt Robert Thor, writing in 1958 while Boyd was still assigned to Nellis, argued that in the near future a fighter pilot who came back claiming a gun kill would be confessing a failure to use his missiles properly.[22]

Similarly, SAC and General LeMay are blamed for forcing Tactical Air Command (TAC) into the nuclear age against its will by

adopting the supersonic F-105 with its weapons bay for tactical nuclear bombs. But LeMay did not become the chief of staff until after the F-105 first flew in 1958. The truth of the matter is that one of the greatest tactical Airmen in our history, Gen Otto P. Weyland, is primarily responsible for bringing the F-105 and nuclear weapons into the tactical air forces.[23] He needed no persuasion.

The F-111, another favorite whipping post for the acolytes, was the opposite of the lightweight fighter—much too complex and unreliable to maintain in high readiness.[24] Who can argue with that? After all, one of the principles of war is simplicity. But none of the principles are sacrosanct, and one certainly can make a plan or a piece of equipment so simple that it will not do the job. The F-111 became one of McNamara's projects to build commonality into service acquisition. For that reason, the airplane wound up with side-by-side seating instead of the Air Force's preferred tandem seating. The latter would have made the bird too long to fit on an aircraft carrier's elevator. But the Navy pulled out of the program in favor of the huge, swing-winged (like the F-111) F-14, saddling the Air Force with the restricted visibility of the seating arrangement for a couple of decades afterwards. However, for all its complexity and consequently low in-commission rate, the F-111 *did* fill an important role that the F-16 could not—long-range, low-level, all-weather attack with a fairly heavy payload. Indeed, when we could no longer patch the F-111, we had to redesign the F-15 into the E model with conformal tanks and new avionics to replace the 111 because its role remained necessary.

Another ax ground in Coram's book maintains that the Goliaths of the Air Force know not whereof they speak when it comes to CAS. For proof, the acolytes point to the Air Force's hostility toward the purpose-designed A-10. Coram has recently engaged the Goliaths on this issue in the press, apparently with incomplete information.[25] Typically, he makes no attempt in the book to examine the other side of the story; he easily could have found it in the former Air Force historian's book *Strike from the Sky*, which gives Goliath's account of the tale.[26]

Coram labels the A-10 the first purpose-designed CAS airplane in the Air Force—a true statement if one discounts the history of the Air Corps and the US Army Air Forces, both of which had fielded numerous ground-attack designs from the A-8 through the A-26 (the latter having served in Vietnam as late as the 1960s). Acolyte Sprey, doubtless a remarkable man, was the mover behind the A-10 design. According to Coram, Sprey had to compromise somewhat in that the airplane turned out larger than he wanted and had two engines instead of one.[27] Thank God for the Goliaths there. How one gets long loiter time and large, varied ordnance loads without size poses a dilemma. Too, though its maneuverability disappointed Sprey, the aircraft puts on impressive displays even at its low airspeed and altitude.

Boyd and the acolytes utilize the Korean War model as a sacred example of the air-to-air mission yet ignore it in the case of CAS. To be sure, in Korea the P-51 did yeoman's service in this role. However, the single-engine (like the P-51) P-47 proved itself the superior CAS airplane in World War II, but without the liquid-cooling system that made the P-51 vulnerable even to small-arms fire. Although the early jets took a tough rap for not delivering ground support in the early days of the war, the addition of drop tanks and bomb racks to them diminished the P-51's payload advantage. The latter's romantic aura proved so strong that we even witnessed attempts to resurrect an updated Mustang during the Vietnam War. Lost in all of this, as well as in Coram's CAS arguments, is the fact that the slower P-51 had double the loss rate of the F-80—partly because of the vulnerable cooling system and partly because the enemy could hear the P-51 coming, whereas the Shooting Star arrived over the fight almost as soon as the sound it generated. Furthermore, the F-80 spent substantially less time within range of the enemy's ground fire. Consequently, the jet had double the in-commission and sortie rates of the Mustang as well as half the losses, as mentioned above. Without doubt, the

Navy/Marine Corsairs and the Mustangs did crucial work in the very early days when no jet runways were available. But in time, flying twice as many sorties, even with lighter bomb loads, and experiencing half the losses were bound to have an effect. Ground forces have perennially complained about the lack of responsive CAS from the Air Force. The jets did not need the warm-up of the Mustangs, and they could get from the airfield to the battle area much quicker—that, too, was a factor.[28]

Thus, the case of the Goliaths, even if it were as Coram paints it, perhaps has some merit. The armament of the A-10 requires that it go low and get close to an irate enemy. The aircraft does that more slowly than, say, the F-16, so enemy gunners and missileers have more time to aim and fire their weapons before the A-10 gets close enough to fire its fearsome GAU-8 or even its Maverick missiles. The extra engine proves helpful here, as does the load of armor carried by the "Hog." But the A-10 also takes longer than the F-16 to get out of the range of enemy weapons, and it does not have the effectiveness of the AC-130 from altitudes above most of the ground fire.[29] In the end, Coram accuses the Goliaths of finally accepting the "loathed" A-10 only to guarantee that the Army would not snatch away the CAS mission. Perhaps it is well that they did so, given the results with attack choppers in the second war against Iraq.[30]

Myth Four:

John Boyd changed the art of war; he is the greatest military theorist since Sun Tzu.

According to Coram, "The academics who know of Boyd agree that he was one of the premier strategists of the twentieth century and the only strategist to put time at the center of his thinking. That is as far as they will go. But Boyd was the greatest military theoretician since Sun Tzu."[31] That is a pretty strong statement. It passes over some rather distinguished theoreticians: Carl von Clausewitz, Henri Jomini, Alfred Thayer Mahan, Julian Corbett, Giulio Douhet, Billy Mitchell, and even John Warden—all of whom wrote books. Can Coram's statement possibly be valid?

I first heard John Boyd speak at Air University soon after he retired. I much admired his delivery, for it did not depend upon the lame humor so typical of presentations of the day. Rather, his presentation was clear, and his earnestness was obvious. It did seem to me, however, that he depended rather heavily on Russell Weigley's *The American Way of War*—I wondered why a retired colonel was just getting around to understanding the importance of time, surprise, maneuver, and the inadvisability of charging up the hill at Fredericksburg or against the center of the fortified Yankee line at Gettysburg.[32] All of the second lieutenants coming out of West Point in 1952 were fully cognizant of those things. Gen Norman Schwarzkopf, who graduated 42nd out of 480 four years later, certainly needed no instruction on the nature of the blitzkrieg or on the inadvisability of following Ambrose Burnside's example with a charge up the middle.[33]

But then it occurred to me that Clausewitz, Jomini, Mahan, Corbett, Douhet, and Mitchell had written their books at the end of their careers too—though Boyd never got around to putting his theories into book form. Rather, they took the form of briefings delivered from large numbers of slides. As he got further into retirement, he clearly was doing ever-more reading in a wide variety of sources. The briefings became longer and longer, and, as Coram notes, "his briefs were virtually impenetrable without an explanation."[34] Certainly, Clausewitz makes for tough wading; Mahan is easier reading but requires some effort. Douhet and Mitchell are easier still, although both have come in for heavy criticism. But I suppose one would not have to be a purist to argue that a theoretician must also be a teacher and that unless he delivers his ideas in usable form, as in a book, then the most brilliant concepts will go for naught.

Moreover, to be a "strategist," one must be in a strategy-making position—never the case with Boyd. All of his work at Nellis occurred at the tactical level, and ever after he found

himself on the technical side of Air Force work. Coram makes much of the notion that Boyd affected the strategy for the Gulf War after Secretary of Defense Dick Cheney called upon him for ideas. Undoubtedly, such contact took place, but victory has a thousand fathers, and the vice president has not indicated that Boyd's ideas were any more important than many others. Allegedly, Boyd prevented the Goliaths (of the Army in this case) from going "high diddle diddle up the middle."[35] But Coram himself says that Cheney denied being the vital factor in changing the plan and that the decision makers favored a head-on assault. However, a wider sweep to the left—the well-known "Left Hook"—depended upon the deployment of a second corps. Coram (as well as Boyd and his acolytes) has considerable respect for the Marine Corps, as do all thinking Americans. He gives great credit to the amphibious threat, which he says fixed the Iraqi left flank so that it could not move to meet the Left Hook maneuver.[36] He also admires the rapid march of the marines on that end straight up the middle into Kuwait City—with great effectiveness and minimal losses.[37]

Unhappily, according to some individuals, the march was *too* swift because the marines got so far ahead of schedule that they no longer acted as a fixing force on the coalition's right flank. Thus, they started the enemy pedaling backward prematurely before the Left Hook could complete its swing to trap the Republican Guard and other enemy forces. Coram blames this situation on the Army, although in their book *The Generals' War* (Coram's source for Cheney's role), Michael Gordon and Bernard Trainor say explicitly that the marines acted as a piston that pushed the Republican Guard out of the pocket before the trap could be sprung.[38] The point is that, even if Schwarzkopf's original plan had called for nothing other than a frontal assault, chances are the Iraqi army still would have collapsed like a house of cards. Kenneth Brower and Steven L. Canby have remarked that "the Iraqis were so inept that air power could have won the war alone, as could have the army and marines. Almost any plan would have been one-sidedly successful."[39] The grounds for making John Boyd a great strategist seem somewhat shaky.

Much has also been made of his OODA (observe, orient, decide, and act) loop, sometimes more by the acolytes than by Boyd himself. In fact, a street on Maxwell Air Force Base, Alabama, carries the official name "OODA Loop." Can this concept of Boyd's justify the claim that he now outranks all the theoreticians since Sun Tzu? It seems to me that it says nothing new. Every second lieutenant coming out of the Military Academy in 1952 had undergone indoctrination in the principles of war, their utility, *and their limitations.* The whole point of the principles of offensive, surprise, and maneuver lay in undermining the enemy's mental stability—and both Douhet and Mitchell were wont to declare that victory lay in the mind of the enemy. But then, "Command of the Sea" contained nothing new when Mahan set the notions to paper in 1890. Those notions proved enormously influential, even to the point of giving Douhet the idea for the title of his great work, *Command of the Air.* If we credit Mahan and Douhet as substantial theorists, why not Boyd?

What is a theory of war? A common definition would be "a body of ideas about the organization of military force and its employment in war and peace." What is a great theory? It is a theory general enough to be used in a reasonable time and applied to a wide variety of cases. The ability to apply it to all cases would also be nice. Further, a good theory is specific enough to serve as a useful aid in decision making. An overly general theory is not very useful (e.g., motherhood is good), and an overly specific one has only limited usefulness (e.g., Jane is a good mother). Clausewitz declares that when troops go to the battlefield, they must leave theory behind. Because theory helps organize thought and education to make war more understandable, one must present it in digestible form—usually in writing.

Can we use the OODA loop in many cases? Yes, especially at the tactical level. All cases—

never. We turned inside the enemy's OODA loop in the case of the *Mayaguez*, and many Airmen and marines died because of it. Gen David Jones pleaded with the politicians to delay the assault on Koh Tang Island until Friday, but his superiors insisted that it go down at the break of day on Thursday.[40] Unhappily, we did not know that the Cambodians had decided to release the *Mayaguez* crew and that it was already en route to freedom; thus, Airmen and marines started their disastrous landings for no purpose. Certainly the surviving marines were *not at all* contemptuous of the Airmen who pulled them out or died in the attempt. The US Congress turned inside the British OODA loop in 1812 when it declared war two days *after* the Orders in Council had been rescinded, resulting in the burning of the White House.[41] Clearly, there is a time for quick action, and there is a time for deliberate decision making. The OODA loop offers nothing new, and many of the Goliaths from Rolling Thunder to Gen Michael Short have lamented the failure to implement it. Yet, Gen Wesley Clark also has made a plausible case that sometimes gradualism is necessary for the sake of coalition cohesion. It is the strategist's task to discriminate between the two. People have a natural tendency to come up with a good idea, such as one for fighting MiGs over the Yalu, and then try to apply it to all manner of cases. Boyd, and especially his acolytes, tried to escalate the idea from the tactical level in all manner of ways. A universal model probably will never exist, and many people have declared that all wars are unique and must be considered on their own merits—or so says one of our passed-over theoreticians, Carl von Clausewitz.[42]

Boyd never presented his body of ideas in digestible form, and his acolytes, including Coram, make a virtue out of his deliberate refusal to do so.[43] Consequently, his notions remain too vague to amount to anything other than a moving target of little use in structuring a debate or attempting to educate one's mind on the nature of war before arriving at the battlefield. Coram insists that Boyd is the greatest fighter pilot in Air Force history and the greatest theoretician since Sun Tzu.[44] I have looked into the mirror, but I cannot see the proof for *either* case. Nor do I see an apostle in Coram's mirror. I do, however, see on page 130 of his book the statement that "*Southerners and fighter pilots know the story is more important than the facts*" (emphasis added). The part about fighter pilots is wrong; to the rest of the sentence, I say amen![45] □

Notes

1. "John Boyd, Technology and the Careerists" [letter to the editor], *Naval War College Review* 51 (Winter 2003): 141.

2. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (Boston: Little, Brown, 2002).

3. See Coram's Web site, http://www.robertcoram.com/prostate.html. No doubt Col John Boyd's death from prostate cancer struck a chord with Coram, given his own experience with the disease.

4. Robert Coram, "Two Days in May," *Atlanta* 41 (May 2001): 1c, http://www.au.af.mil/au/aul/lane.htm (go to the EBSCOHost link).

5. I do not imply that an inevitable disconnect exists between journalism and good military history. A case in point is Rick Atkinson, whose book *Crusade: The Untold Story of the Persian Gulf War* (Boston, MA: Houghton Mifflin, 1993) is one of the best accounts of the first Gulf War and whose first volume of the history of World War II has garnered rave reviews. Yet, he is a leading journalist for the *Washington Post*. Clearly, he understands the critical use of interview sources and the necessity for valid archival research.

6. Coram, *Boyd*, 273.

7. Retired from the Air Force with 30 years of service, I have been invited to speak at Quantico four times, and I number among my thesis students two marines of the highest character. Clearly, some marines may be contemptuous, but Coram is much too prone to sweeping generalizations.

8. Grant T. Hammond, *The Mind of War: John Boyd and American Security* (Washington, DC: Smithsonian Institution Press, 2001).

9. Dr. Grant T. Hammond, "Myths of the Air War over Serbia: Some 'Lessons' Not to Learn," *Aerospace Power Journal* 14, no. 4 (Winter 2000): 1, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj00/win00/hammond.pdf; and idem, "Myths of the Gulf War: Some 'Lessons' Not to Learn," *Airpower Journal* 12, no. 3 (Fall

1998): 1, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj98/fal98/hammond.pdf. Hammond does not deal with Boyd's private life. Although Coram deplores the irresponsibility that Boyd displayed in his private life, he seems to take lightly the irresponsibility in his life as an officer.

10. Long ago, Lt Col (later Gen) Walter Kross also used a myths format to discuss the military-reform movement of that day. See "Military Reform: Past and Present," *Air University Review* 32, no. 5 (July–August 1981): 101–8, http://www.airpower.maxwell.af.mil/airchronicles/aureview/1981/jul-aug/kross.htm. Although I address four myths here, I do *not* mean to imply that there are *only* four of them—either in the book or among the acolytes.

11. Kross, "Military Reform: Past and Present."

12. As Coram points out, Boyd's sole command occurred with the combat support group at Nakom Phenom in Thailand in 1972 at the end of the war—out of the operations field although it sometimes served as a stepping-stone to higher things.

13. Association of Graduates, US Military Academy, *Register of Graduates and Former Cadets* (West Point, NY: West Point Alumni Foundation, 2000), sec. 4, 323–32.

14. Many more myths are wrapped up in that one sentence. The peasants who flew the MiG-15 learned much between 1953 and the MiG-21 in 1965 because they had started from a much lower base than the Americans. Too, if one had reequipped the entire US Navy and Air Force with MiG-21s, the picture would have become even more horrible because the MiG could not carry a bomb load; nor could it have flown from Korat to Hanoi, and it did not have the support of tankers. Had the flight taken place over Acapulco instead of Hanoi, it would have been no contest at all. In short, the acolytes are using a false analogy to compare the MiGs with the F-4s and F-105s—it is as clear a case of likening apples to oranges as one could desire. In any event, a big chunk of the air superiority enjoyed in Korea resulted from B-29s preventing the building of MiG airfields close to the battle. Furthermore, Joseph Stalin implemented a deliberate policy of avoiding a nuclear confrontation with the United States by strictly limiting his MiG units to the air defense of the Yalu River border and nothing more. Thus, even the B-50s and B-36s that LeMay would not deploy to Korea had a role in the maintenance of air superiority there. The point is that the entire model used by the reform movement to build its argument was bogus. In any event, the maintenance of a two-to-one kill ratio in Vietnam, in the enemy radar environment, far from one's own bases is a testimonial to strength—not weakness.

15. William S. Lind, "The Three Levels of War: Don't Take John Boyd's Name in Vain," *Counterpunch*, 3 May 2003, http://www.counterpunch.org/lind05032003.html; Franklin C. Spinney, "Genghis John," US Naval Institute *Proceedings*, July 1997, http://www.d-n-i.net/fcs/comments/c199.htm#Reference; and "Harry Hillaker—Father of the F-16," interview by Eric Hehs, *codeonemagazine.com*, http://www.codeonemagazine.com/archives/1991/articles/jul_91/july2a_91.html.

16. Lt Gen John J. Burns, probably one of the Goliaths who were nemeses of the "reformers," argues that the primary driver for the lightweight fighter was not combat effectiveness but the desire to increase its appeal for foreign military sales: "As a result of a lot of dialogue, in which I was involved partly, the agreement was that the Air Force would develop the lightweight fighter, at that time not yet chosen, and inventory 650 of them because we needed a production base of 1,000 in order to make the price competitive with the Mirage primarily in the European consortium buying. They were going to buy about 350 so; we *had* to buy 650" (emphasis added). Interview by Hugh N. Ahmann, 5–8 June 1984, transcript, 306, Air Force Historical Research Agency, Maxwell AFB, AL.

17. USAF, "F-16 Flight Mishap History" and "F-15 History," http://safety.kirtland.af.mil/AFSC/RDBMS/Flight/stats.

18. Dr. Daniel L. Haulman, "Table of USAF Aerial Victories by Guns and Missiles," draft (Maxwell AFB, AL: Air Force Historical Research Agency, n.d.). Even in Vietnam, missiles got 89 kills, and aerial guns only 43. In the first Gulf War, guns got two helicopters, and missiles downed 33 airplanes. Missiles registered all of the kills in Kosovo.

19. Burns, interview, 192–93.

20. Ibid., 223–25. One encounters a bit of a dilemma here. The point of the OODA loop is to get inside the enemy's decision cycle to enable a first shot. One of the perceived benefits of the F-16 is that its small size increases the likelihood that the pilot will spot the larger enemy aircraft first. However, the initial design called for limiting it to guns and short-range missiles, both of which had to be fired from *behind* the enemy. Thus, enemy airplanes large enough to carry radar missiles and the required identification equipment would have the first shot from the front hemisphere. Even though improvements to the Sidewinder allowed some forward-hemisphere shots, its range remained short, and the pilot in the bigger airplane had a better chance of spotting one in front in time to eject decoy flares. On the importance of the first sighting, see Mike Spick, *The Ace Factor: Air Combat and the Role of Situational Awareness* (Annapolis: Naval Institute Press, 1988), 6–8. In fact, the book's sole point deals with becoming sufficiently aware of the situation to enable the first pass on the enemy—something that John Boyd and many people before him understood.

21. Lest the reader assume that I am a company man defending the Goliaths and the Air Force on those grounds, I should point out that I had one tour as a tanker pilot in the 341st Strategic Bomb Wing and another as a C-130 pilot in the 388th Tactical Fighter Wing—experiences that would hardly make one a shill for either the fighter or bomber generals.

22. Capt Robert Thor, "GAR-8," *Fighter Weapons Newsletter*, June 1958, 29–30. Coram declares that "Boyd and Christie [in a Pentagon briefing during the Vietnam War] expanded the regular E-M [energy-manueverability] brief to show how woefully inadequate were America's air-to-air missiles. . . . The Sidewinder missed its target and plowed into the ground so often that the pilots called

it the 'Sandwinder.' " Coram, *Boyd*, 178. (It may have been inadequate, but it *was* the first guided missile ever to get air-to-air kills; the Soviets thought enough of it to copy it.) Boyd had earlier declared that "in summary, since the underside attack provides the greatest advantages—IR, G, surprise and performance—we should employ this attack whenever possible. As you will see later, this holds true for both fighter-versus-bomber and fighter-versus-fighter. When compared with a gun attack, AIM-9B [early Sidewinder] is far superior, since the range of the missile allows us to get into an effective cone of fire." Boyd, "Aerial Attack Study," rev. ed., 1964, 27, Air University Library, Maxwell AFB, AL.

23. Weyland was Gen George S. Patton's Airman in command of the XIX Tactical Air Command during the march across France and the commander of Far East Air Forces during the Korean War before he came home to command TAC during the mid-1950s. Gen Otto P. Weyland, interview by Dr. James Hasdorff, 19 November 1974, transcript, 253, 260, Air Force Historical Research Agency, Maxwell AFB, AL.

24. See Coram, *Boyd*, 346–47, wherein he declares that "Spinney proved that virtually everything the Air Force had promised the American people about the F-15 and the F-111D was false."

25. Robert Coram, "The Hog That Saves the Grunts," *New York Times* [Op-Ed], 27 May 2003, http://www.robertcoram.com/op_ed.html. Here, Coram says (without citing a source) that the Air Force plans to retire all A-10s and also asserts without qualifiers that "this is a serious mistake."

26. In *Strike from the Sky: The History of Battlefield Air Attack, 1911–1945* (Washington, DC: Smithsonian Institution Press, 1989), Richard P. Hallion argues that *all* successful CAS aircraft moved from the air-to-air to the air-to-ground role (incidentally, he does not explain away to my satisfaction the examples of the Shturmovik and Kenney's B-25 gunships in the Southwest Pacific). But Hallion has a case in that the axiom "speed is life" for aircraft flying low over the battlefield has been demonstrated many times—as has the axiom that "the most useless thing in the Air Force is altitude above you."

27. Coram, *Boyd*, 234–36.

28. Burns, interview, 79; George E. Stratemeyer, *The Three Wars of Lt. Gen. George E. Stratemeyer: His Korean War Diary*, ed. William T. Y'Blood (Washington, DC: Air Force History and Museums Program, 1999), 34–35; Thomas C. Hone, "Korea," in *Case Studies in the Achievement of Air Superiority*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1994), 454–55; and Allan Millett, "Korea, 1950–1953," in *Case Studies in the Development of Close Air Support*, ed. Benjamin F. Cooling (Washington, DC: Office of Air Force History, 1990), 362–63.

29. This deficiency may be changing now because of the great success of the economical Joint Direct Attack Munition and the movement to reduce bomb size, as permitted by its accuracy from altitude. Some current thinking holds that the ability to hit targets reliably from altitude, even through the clouds, with spotters on the ground (as in Afghanistan) has diminished the need for choppers and for A-10s to go low and close to the target.

30. Stephen Trimble, "AH-64 Apache's Deep Strike Role under Army Review, Keane Says," *Aerospace Daily*, 6 August 2003, 1, http://ebird.dtic.mil/Aug2003/s20030806206809.html (accessed 9 August 2003).

31. Coram, *Boyd*, 445. He neither identifies the "academics" nor gives a citation for the last statement; the latter, therefore, depends upon his *own* authority.

32. Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (New York: Macmillan, 1973).

33. Association of Graduates, US Military Academy, *Register of Graduates*, sec. 4, 363. Coram does mention the blitzkrieg as setting something of a precedent for Boyd's thinking—time was certainly a crucial part of the blitz.

34. Coram, *Boyd*, 329.

35. Coram rarely attributes his material but does credit Michael R. Gordon and Gen Bernard E. Trainor's *The Generals' War: The Inside Story of the Conflict in the Gulf* (Boston, MA: Little, Brown, 1995), for the information on Cheney's role.

36. One can find any number of sources that assert that the amphibious threat fixed the enemy's left flank, but Adm Stansfield Turner, in his article "Is the U.S. Navy Being Marginalized?" *Naval War College Review* 56 (Summer 2003), remarks that "the last opposed amphibious assault was made in 1950 at Inchon. We planned one at Wonsan in 1951 and another at Kuwait in 1991: both came a cropper due to mines. Today it is difficult to imagine where the United States might want to conduct a major opposed amphibious assault in the next twenty years or so" (98). Perhaps the Iraqis did not realize that, or perhaps they just had no capability or desire to swing out to the west. Maybe the Marine Corps has recognized this in that it has been abandoning the traditional "ship-to-shore" description of its mission in favor of "ship-to-objective" nomenclature.

37. Coram, *Boyd*, 424–26.

38. Ibid., 425; and Gordon and Trainor, *Generals' War*, 362.

39. Kenneth S. Brower and Steven L. Canby, "Weapons for Land Warfare," in *The Future of Smart Weapons: Proceedings from a AAAS Annual Meeting Symposium, 8 February 1992* (Washington, DC: American Association for the Advancement of Science, 1992), 1.

40. John F. Guilmartin Jr., *A Very Short War: The Mayaguez and the Battle of Koh Tang* (College Station, TX: Texas A&M University Press, 1995), 37–38.

41. Thomas A. Bailey, *A Diplomatic History of the American People*, 6th ed. (New York: Appleton-Century-Crofts, 1958), 144.

42. Herewith the obligatory Carl von Clausewitz endnote: Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 88.

43. Barry Watts to David R. Mets, e-mail, 31 July 2003.

44. Coram, *Boyd*, 255, 445.

45. If you really need to read a work on Boyd, choose the Hammond book.

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The Pentagon's New Map: War and Peace in the Twenty-First Century by Thomas P. M. Barnett. G. P. Putnam's Sons Publishers (http://www.penguinputnam.com), 375 Hudson Street, New York, New York 10014, 2004, 320 pages, $26.95 (hardcover).

Run, don't walk, to your local bookstore and buy this book or order it on your computer! Why? Let me explain. I first met Thomas Barnett in a briefing he gave to a group of recent brigadier-general selectees. At the beginning, some thought that this might be a square-filler lecture on world events. By the time he finished, however, much of the oxygen had left the room. I quickly followed up with a Web search (http://www.thomaspmbarnett.com), yielding an *Esquire* article on Barnett that outlined a new way of looking at where our future threats would come from and what implications they held for our military in general—and the Air Force in particular. Needless to say, I was delighted when I heard that a forthcoming book of his would expand on the subject. It didn't disappoint.

In brief, *The Pentagon's New Map* outlines the demise of the nation-state as the principal model for future adversarial scenarios. Barnett provides some credible statistics and evidence of the relationship between "disconnected" parts of the world—stretching in a band from parts of Africa, through the Middle East, and into Asia—that have recently served as a breeding ground for what we have collectively called terrorists. Dealing with such circumstances will challenge traditional military thinking, alter the types of programs and equipment needed, and expand the concept of jointness—including a totally revised and energized interagency process. Such ideas are now regularly making the rounds in Washington, DC, and other arenas, even to the extent that we will need a Goldwater-Nichols Act for the interagency process. Barnett's book gives as good an insight as any I've read into some of the thinking taking place throughout the Bush administration. It promises to help shape discussions and decisions that will determine the outcome of the next Quadrennial Defense Review, assessment of the Base Realignment and Closure Commission, and changes contemplated for the Total Force. Thus, the answer to my question "Why do you need to buy *The Pentagon's New Map*?" is that it will help you understand the most likely world in which you will lead and the changes that world portends for our military.

Col Randal D. Fullhart, USAF
Maxwell AFB, Alabama

F-4 Phantom, Combat Legend Series, by Martin W. Bowman. Airlife Publishing, Crowood Press (http://www.crowoodpress.co.uk/780/index.asp), The Stable Block, Crowood Lane, Ramsbury, Wiltshire SN8 2HR, England, 2003, 96 pages, $14.95 (softcover).

Sometimes you just feel nostalgic—a picture or a story takes you back. Once, coffee and a cigarette were standard for every briefing, and a trip to the big house was mandatory after debriefing. But as my hair waxes gray and my skin becomes more accustomed to blue polyester than green Nomex, it seems surprising that my fondness for all things fighter hasn't faded. Fortunately, Martin Bowman's *F-4 Phantom* is the type of book that those who share a memory of Vietnam, the Cold War, and 1970s nostalgia might enjoy just as well as those who flew old "Double-Ugly" themselves. It is a special honor for me to review a book on the Rhino during its final year in Air Combat Command (ACC).

Bowman begins his book with a one-page chronology, which I found useful for situational awareness. He divides the F-4's service into five

logically presented chapters: "Prototypes and Development," "Operational History," "The Phantom Men," "Variants," and "International Operators." Readers will appreciate the many photos and illustrations, both black and white and color, and the detailed captions. The book concludes with several appendices, particularly useful to modelers or trivia aficionados; a bibliography of further readings; and a brief index.

I appreciate how the author mixes history with nuts-and-bolts details of the venerable F-4—at one time one of the most numerous and certainly one of the best fighter planes in the world. In the Phantom's long history, the attack on the Paul Doumer Bridge in Vietnam in 1972 stands out in the minds of many F-4 jocks and military historians. This event was a milestone in the US Air Force's long quest for precision effects—an airpower legacy tracing its roots to Billy Mitchell, the sinking of the *Ostfriesland*, and the Air Corps Tactical School. The book notes that F-4s used laser-guided bombs to drop spans of this huge bridge, a key transportation route for enemy supplies from China (pp. 25–26). The structure had defied destruction after many unsuccessful attacks because of the difficulty of destroying a reinforced, pinpoint target with dumb bombs. Bowman clearly describes bomb and unit designations but fails to provide a sense of being there, thus missing an opportunity to place into proper historical context a major step on the road to our current precision capability.

Bowman includes an interesting international aside in the discussion of surface-to-air missiles (SAM) in 1973's Yom Kippur War, which began with a surprise attack by local Arab powers on Israel during an important religious holiday (pp. 68–69). Israel's F-4s, its best fighters, faced a layered defense. The larger SA-2 Guideline and SA-3 Goa SAMs protected the high altitudes, forcing the F-4s to defend themselves with altitude-depleting hard turns. Once they lost altitude defending against the SA-2, the fighters entered the next threat layer—that of the deadly lower-altitude SA-6 Gainful missile. If the aircrews survived those missiles, they then had to face antiaircraft artillery, Soviet handheld SAMs, and small arms. Israeli losses were high, but US aviators took Israel's lessons to heart and built upon that country's defensive tactics. This short war foreshadowed the threat the coalition faced in Operation Desert Storm, demonstrating the necessity of destroying an enemy's air defenses rapidly to gain air superiority and, thus, enjoy both freedom to attack and freedom from attack.

Unfortunately, the author chooses to devote only a few sparse paragraphs to Desert Storm's F-4s. Not only was this war a *Sawatdee*—a farewell of sorts—for America's RF-4 and F-4G, but also the Weasels proved absolutely vital to the success of the coalition in our first war in the Gulf (pp. 27, 35–36). A unique airpower asset, the Wild Weasel had four eyes, outstanding radar-hunting equipment, and experienced aviators honed in the Cold War and Green Flag exercises. In Desert Storm, these crews fought high-altitude duels against one of the most menacing air-defense arrays in the world at the time. Weasels fired over 1,000 high-speed antiradiation missiles (HARM)—the F-4G's raison d'être. The 35th Tactical Fighter Wing alone fired 905 HARMs, destroyed over 254 enemy radars, and suppressed hundreds of additional missile attacks against coalition aircraft in Desert Storm. In fact, the F-4 was so intimidating that other fighter jets used Phantom call signs (e.g., Budweiser, Michelob, etc.) deceptively, making false HARM-launch radio calls on frequencies monitored by the Iraqis in order to trick SAM operators, who would power-down their radars in an attempt to hide from an imaginary F-4 firing an imaginary HARM missile. That's deterrence—and virtual presence! Unfortunately, the author fails to provide sufficient depth of coverage on the crucial role of Weasels in this war.

The F-4's flying days in America are waning although several allies still fly the Phantom, which will probably continue to serve as a drone or test chase for a few more years in the States. For the past several years, US Air Force and German instructors have trained German air force crews to fly the Phantom at the 20th Fighter Squadron, Holloman AFB, New Mexico—also home of the famous F-4 Fighter Weapons School. But in December 2004, the final ACC F-4 will land, and the 20th Fighter Squadron will deactivate, marking the end of an era. Though in its twilight, the F-4 hasn't yet seen its last sunset; sadly, however, the number of them sitting on sticks or in museums probably matches the number still flying. Fortunately, the Combat Legend series includes some great photos of F-4s in unusual and international paint schemes, which the author has preserved for nostalgic and curious readers alike.

Overall, Martin Bowman has written an enjoyable tabletop book on a classic fighter that aviation enthusiasts will find appealing. Although it doesn't feature the type of documentation preferred by historians, *F-4 Phantom* is easy to read and packed with photos. It would serve as a fine addition to a

personal aviation library, primarily for its developmental, technical, and international overview, as well as its photos and appendices. Unlike bell-bottom jeans, the F-4 is a piece of 1970s nostalgia that still deserves to have fans.

Col (sel) Merrick E. Krause, USAF
Washington, DC

History of the Joint Chiefs of Staff: The Joint Chiefs of Staff and the War in Vietnam, 1969–1970 by Willard J. Webb. Office of Joint History, Office of the Chairman of the Joint Chiefs of Staff, for sale by the US Government Printing Office (http://www.gpoaccess.gov/index.html), 732 N. Capitol Street, NW, Washington, D.C. 20401, 2002, 380 pages, $46.00 (hardcover).

Willard Webb's *The Joint Chiefs of Staff and the War in Vietnam, 1969–1970* is one of the first volumes published as part of the Joint Chiefs of Staff (JCS) official history of the Vietnam War. That history serves as a companion series to the Joint Chiefs of Staff and National Policy series. The years 1969–70 were pivotal during the war. Although devoid of high-profile events such as the Tet offensive, they marked the new administration's promotion of Vietnamization, accelerated pacification, and expansion of the war while simultaneously advancing the Paris negotiations. The JCS played an important role in the development of all of these issues.

Given the importance of this period, it is surprising that the Office of Joint History published this work essentially as Webb wrote it nearly 30 years ago. With the exception of some additional information taken from Secretary of State Henry Kissinger's memoirs regarding the Paris negotiations, this volume does not take advantage of any subsequent research or scholarly publications. Instead, the Office of Joint History wanted to "convey the attitudes of senior policymakers without the benefit of hindsight." But the integration of recent scholarship, as well as other archival data, is not inimical to conveying the attitudes of decision makers while they were in the process of developing policy. Too often the work simply states that it is unknown whether or not a memorandum or concept prepared by the JCS had any impact on the development of policy. Consequently, in those instances the reader has no basis for evaluating the true role of the joint chiefs.

Furthermore, although it is well documented that the JCS has differing views on a variety of force-structure, budget, and policy issues, only rarely does the volume discuss these differences. This tendency creates the impression of artificial unanimity and imparts to the book the sterility of a chronology as opposed to the insight of true history.

Notwithstanding these problems, one clearly discerns a number of very interesting issues—the debate over limits placed upon military power, for example. It is also informative to see how the joint chiefs responded to budget cuts imposed by the Nixon administration. From the JCS perspective, decisions such as determining the number of air sorties to be flown should be based on military requirements rather than budgetary or political matters.

Although its subject offered more potential than the volume realized, *The Joint Chiefs of Staff and the War in Vietnam, 1969–1970* nevertheless remains an important starting point for researchers. The book clearly delineates the issues that confronted the JCS, and its footnotes alone establish an important foundation for future archival research.

John C. Binkley
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Battle: A History of Combat and Culture from Ancient Greece to Modern America by John A. Lynn. Westview Press (http://www.westviewpress.com), 5500 Central Avenue, Boulder, Colorado 80301, 2003, 432 pages, $27.50 (hardcover).

Whether or not they agree with it, *Battle* will cause readers to reexamine long-held beliefs and conventional wisdom. John Lynn, a professor of history at the University of Illinois at Urbana-Champaign, examines societies and the armies they produce, describing the interrelationship between a military's and a society's values, beliefs, assumptions, expectations, and preconceptions. This relationship, he believes, influences war and victory more than any other factor. Although the book is thought provoking, readers should know that it is not for the armchair general or history buff. At times, the author's rich, complicated ideas bog down this work, which is gaining acceptance in academic circles.

Battle provides a fascinating interpretation of why different people armed with similar technologies and weapons choose to fight differently. For instance, between 1600 and the late 1700s, armies followed linear tactics: men lined up in distinctly

colored uniforms, marched to within a few yards of the enemy, and blazed away. Conventional wisdom argues that the smoothbore musket's range and accuracy demanded densely packed formations, while battlefield smoke and communication limitations demanded unique uniforms, enabling generals to discern friend from foe. Yet, these reasons do not provide the complete answer since armies could have utilized more open tactics, save for the prejudice of officers and aristocrats against lower-class soldiers. With the advent of the French Revolution and civic militarism, Napoléon showed that free men, defending a system in which they believed, would fight more independently. Thus, we see more skirmishers, attacks by columns, and advances along parallel axes.

Two of the more interesting chapters concern the US war with Japan during World War II and Egypt's October (Yom Kippur) War. Lynn challenges recent scholarship that asserts that US racism caused the former conflict, shaped combat operations, and motivated men to fight. If racism caused the war, it was Japanese racism against Westerners—not vice versa. The United States grounded its strategy and doctrine not on preconceived racist ideas but on technology and geography, all the while respecting Japan's fighting ability and equipment.

As for the Yom Kippur War, Lynn capitalizes on Kenneth Pollack's excellent *Arabs at War: Military Effectiveness, 1948–1991* (2002) to claim that the Egyptians successfully modified their doctrine to conform to their culture. Simply put, the Egyptian military prior to 1967 had suffered two decades of military defeat at the hands of the Israelis. After the Six-Day War, Egyptians looked honestly at their strengths and weaknesses, tailoring their tactics to maximize assets and minimize their failings. The result was the tactically brilliant Suez crossing. As long as the Israelis reacted according to plan, the Egyptian army held its gains. Problems arose when President Anwar Sadat forced the army to deviate from the script and when the Israelis developed solutions to the new Egyptian tactics.

Unfortunately, what promised to be an excellent study is flawed by Lynn's fratricidal attack on classics professor Victor Davis Hanson. Hanson's *Carnage and Culture: Landmark Battles in the Rise of Western Power* (2001) posits that Western culture—with its concept of shock infantry that seeks to close with and destroy the enemy, together with its relative freedom, capitalism, self-criticism, scientific inquiry, and civic militarism—has been responsible for the West's dominance for the last 2,500 years. Lynn takes umbrage with Hanson's assertions of 25 centuries of unbroken supremacy and with the idea that the West's military culture is unique.

Lynn's attack is misguided on three counts. First, his comparison of *Battle* with *Carnage and Culture* is faulty because the former examines conflicts pitting East versus East, West versus West, and West versus East while the latter deals exclusively with West versus East. Second, Lynn claims that the West did not always fight like the Greeks—seeking decisive battle with brute force against brute force—but often avoided battles. He fails to recognize that battle avoidance was frequently part of an overall strategy designed to discredit the enemy in the eyes of the people, reduce his resources, and draw him out of his fortifications to fight decisive battles. Finally, Lynn somehow has Hanson maintaining that attrition is one of the ingredients of the Western way of war. Disregarding Hanson's contention that the West repeatedly fights with fewer men and weapons, Lynn goes to great lengths to argue the opposite: "Attrition warfare depends on superiority in manpower and material to batter an enemy into submission, and is usually costly. In contrast, maneuver warfare maximizes effect by movement with the goal of achieving greater results at far less sacrifice in blood" (p. 285). Having constructed this straw man, he then maintains that the West habitually selects maneuver, the practice of the US Marine Corps: "Rather than wearing down an enemy's defense, maneuver warfare attempts to bypass these defenses in order to penetrate the enemy system and tear it apart" (p. 305). Amazingly, he even contends that Egypt's (Eastern army) Yom Kippur attrition offensive more closely resembles Hanson's thesis than does Israel's (Western army).

At this point it becomes clear that Lynn has completely missed the essence of *Carnage*, a close reading of which reveals that a key Western characteristic is not attrition but a willingness to close with the enemy—through attrition or maneuver—in order to crush him. In this light, one clearly sees that Israel more closely resembles the Hanson model. One also has to question Lynn's reading of Marine doctrine since that service's latest doctrine actually argues against Lynn: "*Firepower and attrition* are essential elements of warfare by maneuver. In fact . . . where strength has been focused against enemy vulnerability, attrition may be extreme and *may involve the outright annihilation of enemy* elements. . . . The object of such local attrition is . . . to *eliminate a key* element which incapacitates the enemy systemically" (Marine Corps Doctrine Publication 1, *Warfighting*, June 1997, p. 46, emphasis added).

Battle is an interesting, thought provoking, but flawed study. Although Lynn's examination of society's interrelationship with the military provides a number of valuable insights, his misconceptions about and misrepresentation of a fellow historian's work call into question his overall argument. A difficult book, *Battle* is not for the casual reader. (Interestingly, however, during a recent meeting of the American Historical Association, Lynn argued for more readable histories: "We really have to talk to a bigger audience" [*Washington Post*, 12 January 2004].) Nevertheless, I recommend *Battle* because military members must think critically about our society and the way we fight.

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Over the Line: North Korea's Negotiating Strategy by Chuck Downs. AEI Press (http://www.aei.org/publications/filter.all/pub_listing.asp), 1150 Seventeenth Street, NW, Washington, DC 20036, 1999, 340 pages, $19.95 (softcover).

An uneasy truce between the Republic of Korea (ROK) and the Democratic People's Republic of Korea (DPRK) has prevailed in Northeast Asia since 1953. Periodic crises involving the North and South, the United States, and the international community have punctuated the standoff between one of the last bastions of totalitarian communism and the rest of the world. Chuck Downs, a career East Asian analyst with the Department of Defense and the American Enterprise Institute, does an excellent job of showing why the North Korean regime instigates crises and how it uses them to obtain advantages from the United States, South Korea, and the UN. The DPRK's recent offer to suspend its nuclear programs makes Downs's book a timely resource for negotiators, strategists, and those who have to implement policy toward the intransigent North.

Even nonspecialists are familiar with the outlines of the negotiations that gave the Korean War its uniquely frustrating character. Downs dedicates approximately one-third of the book to analyzing the details of those negotiations to establish the behavioral patterns that continue to characterize North Korea's negotiating strategies. The remainder of the book shows the consistency of those patterns in subsequent negotiations. The fundamental difference between North Korean negotiators and those from other countries seems to be that compromise and concessions do not appear in the DPRK playbook. North Korean representatives will accept any offer yet refuse to budge on their objectives.

Any negotiating relationship with the DPRK follows a standardized pattern of behavior that focuses on two specific goals: "[First,] the North Koreans negotiate to win concessions that strengthen the communist regime's political control. Second, they pursue objectives designed to enhance their military capabilities" (p. 2). The astounding point Downs makes is that for more than 50 years this isolated, perpetually failing regime has consistently achieved those two goals through manipulating US and international fears of war and through pursuing its bullying style of negotiation.

Five clearly identifiable stages mark the DPRK negotiating strategy. First, the regime will use or instigate a crisis to coerce ROK or US negotiators to the bargaining table. Over the years, these crises ranged from the minor to the spectacular. Minor events such as limited incursions into the demilitarized zone (DMZ) have often served as precursors to significant infiltrations by North Korean special operations forces (SOF) and assassins. The DPRK has gone so far as to launch a SOF attack against the ROK presidential residence in a failed assassination attempt. International outrage over this event may have precipitated the seizure of the USS *Pueblo*, which resulted in a diversion of attention from the blatant attempt to destabilize the ROK regime and a one-year negotiation with the United States over the fate of the ship's crew. The second phase of the DPRK negotiating strategy usually culminates with an agreement that includes statements of guilt, apology, or major concessions from the United States, ROK, or UN participants to the negotiations. Third, after some time passes, North Korea will begin to dispute the terms of the agreement. Fourth, the DPRK will pull out or otherwise break the agreement (often sparking another crisis). And finally, the North attempts to shift blame for breaking the agreement to a third party—usually the ROK or the United States.

This 50-year track record of bizarre negotiating behavior would be of historical interest, but what makes it more fascinating is that it works so well for such an isolated nation. Downs urges those who enter into negotiations with this wily regime to come to the table prepared for abuse, accusation, insult, and distractions. The North Koreans consistently play a weak hand to win—they have enhanced their conventional military capabilities after signing agreements to forgo military expansion; they have developed nuclear-weapons technology in violation of the Nuclear Nonproliferation Treaty and then

used fears of nuclear proliferation to extract from the United States and South Korea significant enhancements to their capability for generating nuclear power. They have assassinated South Korean government officials in Rangoon, Burma, portraying that event as evidence of South Korean oppression by claiming it was part of a spontaneous uprising of South Koreans against their government. They have brutally murdered US and South Korean personnel assigned to patrol the DMZ between the two Koreas. And they have launched SOF invasions of South Korea, attacking ROK and US commercial and military vessels and military aircraft.

Conventional wisdom holds that the North Korean regime will collapse—soon. However, Downs suggests that the regime's goals of survival at the expense of DPRK citizens and the integration of negotiating strategies with military and political power make the impending collapse less likely. Concessions won at the negotiating table invariably strengthen the North's hold on power. The only way to beat the DPRK at its own game, according to Downs, is to back up diplomatic initiatives with military power. Like the schoolyard bully, North Korea invariably retreats or changes tactics when faced with credible threats of force. In Downs's view, the only way to deal with North Korea calls for using a "stick and stick" approach rather than trying to entice the regime into reforming through "carrots and sticks."

Over the Line is both an interesting and informative analysis of one of the most capable and dangerous adversaries that confronts the international community. Downs has provided a useful primer on what to expect when dealing with the North Koreans—for them, negotiating is just war by other means.

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The Soviet Strategic Offensive in Manchuria, 1945: "August Storm" by David M. Glantz. Frank Cass Publishers (http://www.frankcass.com), 5824 NE Hassalo Street, Portland, Oregon 97213-3644, 2003, 451 pages, $64.95 (hardcover).

Soviet Operational and Tactical Combat in Manchuria, 1945: "August Storm" by David M. Glantz. Frank Cass Publishers (http://www.frankcass.com), 5824 NE Hassalo Street, Portland, Oregon 97213-3644, 2003, 368 pages, $64.95 (hardcover).

On 9 August 1945, the Soviet army launched a classic double envelopment of Japanese-occupied Manchuria. Col David M. Glantz, US Army, retired, one of the most knowledgeable American historians of Soviet operations during World War II, has again produced a masterpiece. In the more than 800 pages of this two-volume set—the most comprehensive English account of a series of lighting attacks carried out on three axes over a 3,000-mile front—he explains all ground action in the campaign. The operational and tactical volume explores 10 actions in close-up detail. Glantz's description of this campaign as a graduation exercise for the bloodied, battle-hardened Red Army may be the most appropriate label for this relatively unknown operation. Coming on the heels of the atomic blast at Nagasaki, these military operations in mainland Asia have previously attracted little attention from Western military historians.

Records and documentation of the campaign have always been lacking. Japanese records captured by the Red Army in 1945 remain unavailable, and the Russians have only recently opened their archives. Japanese interrogations after 1945 provide a partial picture of operations. Japan occupied Manchuria in 1931; in 1938 and again in 1939, the Japanese Kwangtung army twice tangled with the Soviet army and lost. Both battles showed the Japanese that the Red Army was a formidable foe and may have led the Imperial Japanese Army to push for conquest in Southeast Asia rather than trying to overcome the Soviet Bear in Siberia. The Soviets and Japanese signed a neutrality pact in 1941, which remained in force throughout World War II. Wary of Japanese motives, Stalin maintained about 40 divisions on the Manchurian frontier throughout the war (1941–45), waiting for an opportunity to attack the Japanese.

By 1945 Stalin wished to reestablish Soviet influence in the Pacific region and rail and base rights in Manchuria, as well as consolidate his position in Mongolia. He also wanted to seize the Sakhalin and Kurile Islands from Japan. In April 1945, Stalin abrogated the neutrality pact and commenced a massive redeployment effort that doubled the number of Soviet forces in the Far East to 80 divisions. During the months of May to July 1945, more than 40 divisions were transferred from East Prussia and Czechoslovakia in the heart of Western Europe via the Trans-Siberian Railroad to the Mongolian and Manchurian border areas. In order to maintain security of this operation that saw 22–30 trains a day on the railroad link, most of them moved under cover of darkness.

The Soviets maintained deception and surprise by relying heavily on night movement, utilizing assembly areas far removed from the border, and following simple but strict measures such as instructing senior Soviet officers not to wear rank insignia. The 6th Guards Tank Army left all tanks, self-propelled artillery, and vehicles behind in Czechoslovakia, picking up new equipment manufactured by the Soviet Ural factories.

Imperial Japanese Headquarters had withdrawn most formations, including all armor and elite infantry, from the Kwangtung army—at one time numbering over 1 million men—reducing it to a mere shadow of its former self. Thus, the Japanese in Manchuria were forced to alter their defense plans vis-à-vis the Soviet Union. The new 1945 plan called for delaying action along the border and withdrawal to prepared defensive lines and then to a stronghold area in southeastern Manchuria for the final defensive action. The Japanese made some fatal assumptions about terrain, believing the western approaches untrafficable due to the vast Mongolian desert and the natural barrier formed by the Grand Khingan Mountains. Their intelligence weakened, the Japanese could not see the usual early warning indicators. Imperial Japanese Headquarters also refused to believe that the Red Army could carry out large-scale combined-arms assaults in Manchuria due to the perceived weakness of the Soviet logistical systems.

On 9 August 1945, the main attack took place on the western Manchurian border where the Red Army bypassed fortified border regions, moving though the desert and Grand Khingan Mountains with minimal problems. Reaching goals ahead of schedule, the army outran its logistics supply lines, so fuel had to be airlifted in using lend-lease DC-3s. The 1st Far Eastern Front formed the second pincer of the double envelopment. Its mission called for penetrating the border area and linking up with forces of the Trans-Baikal Front deep in central Manchuria. It commenced attack in darkness under cover of thunderstorms, catching the Japanese completely off guard. Another army came across the Amur and Ussuri rivers, directly attacking Manchuria.

The Red Air Force was able to establish air superiority because the Japanese had withdrawn most air assets as the American island-hopping campaigns got closer to the Japanese main islands. The Red Air Force flew reconnaissance and resupply missions for the most part, providing close air support during the breakthrough of the so-called concrete belt in northern Manchuria. The Soviets also began operations against the Kurile Islands, attacked the southern half of Sakhalin Island, and conducted amphibious assaults in modern-day North Korea to interdict Japanese sea lines of communication across the Sea of Japan. Their establishment of air superiority allowed the Soviets to take greater risks, dropping battalion-size formations to capture major cities in southern Manchuria and seizing communications centers. The campaign, marked by both tactical and strategic surprise, continued until 17 August 1945. The Japanese did not widely follow the emperor's order to surrender, issued on 14 August, until Imperial Headquarters made a subsequent broadcast. Glantz also explains how the Soviets had planned to seize the northern island of Hokkaido, which would have led to a split Japan during the Cold War. Japanese fighting on Sakhalin Island and the fact that the Japanese gave up after the second atomic explosion thwarted Stalin.

Unfortunately, the volumes contain little on airborne or air force operations, providing few details about the size, capabilities, or types of aircraft used by the Soviet or Japanese air forces. Part of the problem may be the lack of Russian source material; nevertheless, Airmen would have appreciated a bit more information. The books also fail to address military setbacks: the Soviet army may have been bloodied, but no campaign operates without problems. Again, the lack of Soviet archival data could account for the omission. The illustrations, however, are commendable. Rare pictures and maps give readers the proper orientation as they read about the campaign.

Excellent and long overdue accounts, *The Soviet Strategic Offensive* and *Soviet Operational and Tactical Combat* are required reading for World War II historians and people interested in Russian/Soviet tactics. The post–World War II Soviet army studied these operations, as does the Russian army; August Storm serves as a model for task-organized Soviet maneuver-operation groups.

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Globalization and Maritime Power edited by Sam J. Tangredi. National Defense University Press (http://www.ndu.edu/inss/press/nduphp.html), Fort Lesley J. McNair, Washington, DC 20319, 2002, 613 pages, $49.00. http://www.ndu.edu/inss/books/Books_2002/Globalization_and_Maritime_Power_Dec_02/01_toc.htm.

This excellent anthology continues the intellectual exploration started in the National Defense University study *The Global Century: Globalization and National Security.* It focuses on the role of maritime power within the context of the developing economic and social phenomenon known as globalization, which has become the "dominant element of the current security environment" (p. xxv). Accepting the idea that this process commenced at the turn of the last century and has gone through several iterations to reach its current form, the authors of the various papers appear to agree that contemporary globalization "is occurring at a degree unequalled to similar trends in the past" (p. 2).

In the first chapter, Tangredi uses Capt Alfred Thayer Mahan's definition of sea power to explain and expand on the vitally important role of the oceans "as a fluid medium that could not be normally inhabited as a primary means for communication and commerce" (p. 2), which, as Tangredi notes, is also an apt description of the Internet. Within this context, the remaining 29 essays explore how globalization and the end of the Cold War are recasting relationships between nations, and navies; bringing economic, political, and social benefits while facilitating operations for both terrorists and criminals; and establishing strategies and architectures for maintaining order in what appears to be an increasingly anarchic world. Specifically, they carefully examine changes in maritime strategy, international-security coalitions, the globalization of naval operations, and proposals for future naval force structure.

The research presented here is useful to Air Force officers. First, it identifies the linkage between globalization as the developing national-security environment and the ways in which military (specifically naval) power brings about this process while attempting to mitigate those forces that threaten it. Second, it provides some exposition of how the Navy perceives its role in the future security environment. It identifies the Navy and Marine Corps team as the premier "door kicker," providing access to hostile areas for Army and Air Force combat operations. For any member of the defense community involved in joint planning and operations, this work provides several viewpoints on how the Navy expects to operate.

However, readers would have welcomed further elucidation in two areas. One, although the study provides some discussion of exploring possible architectures for future naval expeditionary forces and of working within the proposed standing joint task force, it offers little explanation—even at a theoretical level—of how the Navy will integrate fully with the other services when it conducts joint operations. This becomes increasingly important as the US military moves towards a capabilities-based force that integrates the different services' various functions. Two, inclusion of an in-depth exploration of the potential use of space—a substantive factor both in globalization and the conduct of future military operations—would have added depth to the discussion of the capabilities of potential naval architectures. Notwithstanding these omissions, *Globalization and Maritime Power* is an outstanding contribution to the current debate on the future role of the United States and its armed services.

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Woodbine Red Leader: A P-51 Mustang Ace in the Mediterranean Theater by George G. Loving. Ballantine Books (http://www.ballantinebooks.com), 1745 Broadway, New York, New York 10019, 2003, 292 pages, $6.99 (softcover).

The attraction of this narrative of a fighter pilot in World War II is that it takes place in the Mediterranean. The oft-recounted story, well told here, includes accounts of a young man's introduction to the Army Air Forces and his experiences in all phases of pilot training and combat operations. The story has been told repeatedly in published accounts of Eighth and Ninth Air Force fighters flying out of England or in northwestern Europe but not in the Mediterranean. Although fighter operations share many similarities, as one would expect, different groups—indeed, the perspective of each pilot—provide novel flavors every time. I have learned something new about operations and practices in each of the dozens of comparable books I have read.

As in Europe, pilots flying escort and interdiction out of Italy had a hairy time getting used to combat, experiencing operational accidents and aircraft malfunctions on many missions. The loss of friends and comrades concerned these men more than the task of destroying the enemy in combat. Seemingly, the Mediterranean theater provided better recovery of downed pilots than did other areas. Air rescue was good in the Adriatic, where hundreds ditched. Hundreds, if not thousands, of Airmen returned from Yugoslavia during the war, brought back by a remarkable air-recovery operation at the end of hostilities. The fact that

partisans effectively kept downed pilots out of German hands gave much comfort to P-51 pilots who saw so many of their fellow flyers go down. As in Europe, very few of the original gaggle who filled out Loving's 31st Fighter Group flew 151 missions, as he did, instead suffering the shootdowns or accidents so much a part of operations in the war.

The author came into the service late enough that he underwent final stateside training on the first P-51s used for that purpose. These aircraft had Allison engines, considered obsolete for air combat, but the operational P-51s boasted the remarkable Rolls-Royce Merlin engine. When Loving first arrived in the Mediterranean theater, he checked out in a Royal Air Force Spitfire and flew this aircraft for many months in combat, much of it in ground support, before sufficient Mustangs became available. His fighter group transitioned to escort duty after acquiring the new aircraft. Eventually, Loving became a squadron leader in the summer of 1944 and pinned on captain's bars, all during the 10 months of flying and mostly before he turned 21. Young men had to grow up quickly then.

One of the most instructive parts of this narrative is the involvement of Loving's fighter group in Operation Frantic. This brief attempt to use Russian bases had the potential to provide great reach for the bombers. (Some readers may have forgotten, as I had, that Frantic III was a fighter-bomber attack on targets in Eastern Europe with turnaround on a Russian base.) Loving's fighters flew escort for some 36 P-38s carrying bombs, shooting down German aircraft over Russia. Loving himself downed a Ju-52. Hans Rudel, the famous German Stuka pilot, said this was the only time in the war when his dive-bombers had to jettison bombs due to fighter attack. The politics of the Allies, however, prevented the regularization of these shuttle-bombing operations.

Loving's story not only is enlightening but also extremely well written. I highly recommend that current Airmen read *Woodbine Red Leader* so they can discover the context of air combat in World War II. The lessons are more apropos than one might think.

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The Influence of Air Power upon History by Walter J. Boyne. Pelican Publishing Company (http://www.pelicanpub.com), P.O. Box 3110, Gretna, Louisiana 70054, 2003, 448 pages, $29.95 (hardcover).

Walter Boyne, a retired US Air Force officer and accomplished aviation author, surveys airpower in a manner intentionally reminiscent of Alfred Thayer Mahan's nineteenth-century classic *The Influence of Sea Power upon History, 1660–1783*. Much as Mahan posits six conditions that affect national sea power, Boyne offers five factors—"an analogous set of factors that molds air-power theory and determines its success or failure." They include (1) the air force's budget size and share of the total military budget, (2) the nation's perception of the security threat, (3) the level of aviation technology, (4) the politics of national leaders, and (5) the key people who influence air force affairs (pp. 124–26). According to Boyne, these factors remained valid until the mid-1950s when nuclear-strategy concepts such as massive retaliation superseded them. The author sometimes describes the five factors as "immutable" (p. 141) but notes that they did not apply to the USSR during the interwar era (p. 165). He deems airpower a strong influence upon history when applied correctly in relation to the factors.

Boyne does not mirror every aspect of Mahan's book or compare sea power to airpower. Instead, he says that his book "is intended to look into the development of air-power philosophy over its history by examining the theory and practice of air power as demonstrated not only in war, but also in politics, diplomacy, technology, and mass culture" (p. 11). He defines airpower broadly as "the ability to conduct military, commercial, or humanitarian operations at a chosen place, but not necessarily at all places nor at all times" (p. 18). Although his definition includes air and space activities by military and civilian organizations, the book emphasizes air and military topics. Boyne's remarks about mass culture encompass radio, motion pictures, and other mass-media technologies that developed in parallel with airpower during the twentieth century. Psychological elements—often the fear of airpower's destructive potential—underlie all the factors he discusses. He says less about how airpower may have inspired the popular imagination or encouraged positive attitudes towards advanced technology.

The book uses appropriate references—mostly secondary sources and memoirs—and, for the most part, follows a chronological scheme of organization. Chapter 1 begins in the late nineteenth century, and subsequent chapters extend the narrative through the present day. The only departure from this order occurs in an appendix on military ballooning during the eighteenth and nineteenth centuries. Boyne treats this subject in an appendix "for editorial purposes" (p. 17), but readers who prefer

to trace the airpower story chronologically may wish to read the appendix before perusing chapter 1.

The author applies several analytical methods. The five factors usually remain in the background, tending to govern the way he organizes his narrative. He consistently seeks to depict airpower's influence but avoids the perennial question of its "decisiveness." Key "personalities," central to the discussion, include theorists like Giulio Douhet and practitioners like Gen Curtis LeMay. Boyne also notes that academics and military officers such as Mark Clodfelter, Ben Lambeth, and John Warden have served as influential airpower "philosophers" during recent years (pp. 354–55). Boyne analyzes airpower's influence on at least two levels, the simpler one examining how airpower affects the outcome of battles or related events and the other addressing how it influences history in a broader sense. To justify which events exerted truly significant historical influence, the author often uses "what if" reasoning. For example, he defends the use of atomic bombs against Japan, saying that the bombs saved lives by ending World War II sooner than an invasion could have. He also argues that in Vietnam "if airpower had been applied with a stronger political will from the start . . . it might have actually won the war" (p. 320). Historians might wince at Boyne's frequent recourse to counterfactual arguments, but other readers are apt to find these controversial speculations intriguing. His analytical methods change over the course of the book. Early chapters systematically cover aeronautical developments in various countries, but later ones focus more on the US perspective. The increasing predominance of US airpower during recent decades may help explain this shift in emphasis.

The book devotes more pages to World War II and earlier events than to subsequent periods. Including the appendix on early ballooning, the author spends about 280 pages on the years through 1945 but only about 80 pages on subsequent events. The reason for the heavy emphasis on airpower's early years is not clear. Although Boyne characterizes the combination of the B-29 and atomic bombs used against Japan as "ultimate airpower" (p. 280), he does not claim that airpower's influence upon history declined after 1945. Perhaps the author simply devotes more room to describing airpower events in various countries and combat theaters in chapters on the world wars than he does in chapters about more recent events. For example, the section on the Battle of Britain is longer than the one on the entire Korean War.

Readers should be aware of a few scattered errors, such as Boyne's citing 1968 (actually 1958) as the year NASA came into being (p. 96). Furthermore, the US Navy—not Billy Mitchell's followers—developed the Norden bombsight (p. 149). The text also mistakenly says that the Vietcong were largely imported from North Korea (p. 323) and that Operation Allied Force followed Deliberate Force by two years rather than four (p. 362). However, these errors—mostly of a typographical nature—are only minor detractions from a fine book. Aside from such typos, the endnotes, bibliography, and index are useful, but the study lacks illustrations. Readers would welcome a few pictures.

The Influence of Air Power upon History skillfully conveys a vision that highlights the strength of airpower's influence rather than its supposedly inherent limitations. Not a history of airpower, the book is a highly readable and somewhat controversial interpretation of airpower written for a popular audience. Readers already acquainted with airpower history will likely gain the most from reading it. Timing its publication to coincide with the centennial of the Wright brothers' first flight is appropriate because Boyne's study places airpower in a broad historical context.

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Inventing Iraq: The Failure of Nation-Building and a History Denied by Toby Dodge. Columbia University Press (http://www.columbia.edu/cu/cup), 61 West 62nd Street, New York, New York 10023, 2003, 288 pages, $24.95 (hardcover).

The Origins of Conflict in Afghanistan by Jeffery J. Roberts. Praeger Publishers (http://auburnhouse.com/praeger.htm), 88 Post Road West, Westport, Connecticut 06881-5007, 2003, 288 pages, $69.95 (hardcover).

American armed forces are fighting in Iraq and Afghanistan, but few of us know much about the troubled histories of these two countries. The two books reviewed here offer fascinating insights into the origins of the current situations. Both nations, defined by contact with British imperialism, presented the British Empire with problems that it never successfully resolved. According to the authors, such problems help explain the difficulties currently faced by the United States.

In *Inventing Iraq*, Toby Dodge examines the British attempt from 1914 to 1932 to create Iraq as a modern state. Prior to World War I, the territory that became Iraq was part of the Ottoman Empire. Britain invaded the area south of Basra in October 1914 and by 1918 had conquered most of the area that is now Iraq. In the tangled wartime diplomacy that divided the Ottoman Empire among the European allies, Britain claimed Iraq. After the war, the situation that had supported European imperialism no longer existed. Because Britain had expended much of its economic strength, it could no longer afford to administer large new areas that, at least in the short term, would drain it economically. The political environment had also changed. President Woodrow Wilson's idealism captured people's imagination around the world: markets should be open to everyone, and capable peoples should have a chance at self-determination; even those not yet ready for full self-governance should have an opportunity under international supervision. These ideas resulted in the League of Nations' mandate system. The country assigned as the mandatory power would be responsible to the League for bringing the people under its tutelage to full sovereignty as a member of that organization. Britain accepted the role of mandatory power for Iraq on 5 May 1920.

Iraq was created from three distinct Ottoman administrative districts: Basra, Baghdad, and Mosul. Seeing Ottoman rule as corrupt, the British sought to displace it but had a hard time finding alternate administrators. Nationalism, a new force in the region, greatly complicated British attempts to find rulers who could put an "Iraqi face" on the administration yet remain sympathetic to British interests. Nation building proved a complex, unappreciated, and expensive task. To end their conflict with the Iraqi political elite, the British recommended Iraq's acceptance as a full member of the League of Nations in 1932. According to Dodge, Britain colored its reporting to the League to achieve this end. Iraq became a sovereign nation, not because it had achieved any "standard of civilization," but because of Iraqi nationalism and British domestic politics.

Early in the mandatory period, the Royal Air Force became the chief means of enforcing British authority in Iraq. At the height of an Arab revolt that broke out against the British in 1920, the rebels had over 100,000 insurgents in the field. After suppressing it, the British decided to rapidly remove most of their imperial troops, but raising an Iraqi army proved extremely difficult. Conscripting and funding such a force would likely lead to further rebellions by tribal Iraqis who had little trust of the central government. By using "air policing," the British maintained control without occupying the country. Tribes that refused to acknowledge the authority of the central government were bombed. The Iraqis had no means of opposing the aircraft, which could attack recalcitrants in places that the infantry would have had extreme difficulty reaching, such as the marshes of southern Iraq. The British found that night bombing and incendiaries greatly increased their coercive power. Unfortunately, the use of airpower to maintain control—essentially a despotic practice—served to alienate the majority of rural Iraqis from the central government. Thus, the Iraq that the British left in 1932 was a relatively weak state with fragile political institutions.

As with Iraq, the British never successfully met the challenge of Afghanistan. In *The Origins of Conflict in Afghanistan*, Jeffery Roberts traces British contact with that country from the early nineteenth century to the independence of India and Pakistan in 1947. Following the British withdrawal from South Asia, he focuses on relations between Afghanistan and Pakistan and the problems that this relationship created for US grand strategy. Despite successfully fighting two wars with the Afghans in the nineteenth century, Britain failed to establish a regime in Kabul that aligned itself with British interests, eventually settling for an Afghanistan that served as a buffer between British India and Russian/Soviet expansion in Central Asia. The withdrawal of Britain from South Asia in 1947 left Pakistan on the border with Afghanistan. Although both were Muslim countries, disputes over control of the ethnic Pushtuns in what had been the Northwest Frontier province of British India led almost immediately to animosity between the two. Pakistan's clever diplomacy, coupled with the fact that the United States sought access to Pakistani air bases and wished to see the Pakistani army serve as a bulwark against communism, led America to favor Pakistan under Presidents Truman and Eisenhower. Consequently, Afghanistan ultimately turned to the Soviet Union for aid, which gave the Soviets great influence and eventually permitted an almost bloodless invasion of Afghanistan in 1979.

Roberts also chronicles the difficulties experienced by Afghanistan's own rulers in trying to modernize the country. In the 1920s, King Amanullah tried to promulgate a Western-style legal code, and, at the instigation of his queen, not only established schools for girls but also tried to give women the same freedoms they enjoyed in Western societies.

His reforms led to widespread resistance, the mullahs seeing his reforms as an attack on their authority in particular and on Islam in general. Anti-Amanullah propaganda included spliced pictures that purported to show the queen nude in the presence of European men. The overthrow of Amanullah in 1929 occurred as the direct result of the deeply embedded resistance to change in Afghan society.

Certainly not light reading, both of these scholarly monographs feature extensive documentation and authors who have a good command of their sources. Dodge, a recognized expert on Middle East affairs, devotes the greatest part of his book to an analysis of Iraqi society in the 1920s and Britain's failure to comprehend that society. The US Senate Foreign Relations Committee called him to testify on 4 April 2004 to apply his insights about Iraq to the current situation in that country.

For the most part, Roberts focuses on the period from 1945 to 1960 at the start of the Cold War, ending his narrative with the Soviet invasion in 1979. He characterizes Pakistan's influence on US foreign policy in the region as not altogether positive, believing that Pakistan used strong anticommunist rhetoric to gain US support in order to achieve its own objectives vis-à-vis India and Afghanistan. His last chapter not only provides an excellent summary but also analyzes the failure of the Soviet Union to subdue Afghanistan in the 1980s and the subsequent fragmentation of Afghan society.

By drawing heavily on the British experience in Iraq and Afghanistan, Dodge and Roberts offer valuable insight into two troubled societies in which the US military finds itself deeply engaged. Both *Inventing Iraq* and *The Origins of Conflict in Afghanistan* come to similar conclusions: any country that attempts to change these societies without understanding the long-term nature of their indigenous problems does so at its own peril.

Dr. John Albert
Montgomery, Alabama

Adak: The Rescue of Alfa Foxtrot 586 by Andrew C. A. Jampoler. Naval Institute Press (http://www.usni.org/press/booksearch.htm), 291 Wood Road, Annapolis, Maryland 21402, 2003, 240 pages, $28.95 (hardcover).

The Rescue of Alfa Foxtrot 586 is a rousing good tale of danger and rescue in arctic regions. The author is that marvelous combination of experienced operator in the airplane, service, and region concerned, plus a writer of very considerable talent. No wonder the book is a joy to read. Alfa Foxtrot 586 was a Navy Lockheed Orion P-3 turboprop designed for antisubmarine work (the same kind of airplane forced down recently on Hainan Island). This tale of the Orion, a bird of long and reliable service, will be interesting to all USAF Airmen—but especially to C-130 crew members. Although the Hercules does not resemble the Orion very much externally, they are built by the same manufacturer and have similar systems. Thus, the trouble with a runaway propeller and an engine fire on the Orion will resonate especially well with C-130 folks in the Air Force.

Ditching was much more common in the 1950s, when the two airplanes were designed and memories of World War II were still fresh, but it is as frightening now as it was then. Alfa Foxtrot found itself far out over the frigid seas south of Adak, an island southwest of Alaska, in October 1978 when a runaway prop and multiple fires on engine number one (the one on the far left) brought her down with almost no chance of survival. However, through dauntless courage and competence, most of her crew lived through the ordeal, ultimately rescued by a Soviet fishing trawler that luckily happened to be nearby. An Air Force RC-135 appeared first on the scene, relieved overhead by a Coast Guard C-130. The closest US ship, a Coast Guard vessel, was more than a day's sail away. Almost miraculously, the Orion came down successfully in mountainous seas, after which crew members launched two of the three life rafts. The pilot, Lt Cdr Jerry Rigsby, who had flown the aircraft during the ditching, was the last out of the plane, drowning in a valiant attempt to swim to a raft in the raging sea. One of his crewmen did not make it out because of injury (possibly fatal), and three more died of exposure in the rafts. Ten of the crew of 15 men survived long enough for the trawler to perform a heroic nighttime pickup and bring them into port.

Captain Jampoler, formerly an Orion pilot and a squadron commander, describes all of these events in authoritative detail and with great elegance and passion. His effort is all the more impressive in that he relies not only on his own experience, but also on many primary-source interviews and documents, thus making *The Rescue of Alfa Foxtrot 586* relevant, credible, and engaging. It should find a place on every flyer's reading list.

Dr. David R. Mets
Maxwell AFB, Alabama

Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space by Benjamin S. Lambeth. RAND Corporation (http://www.rand.org), 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138, 2003, 193 pages, $24.00 (softcover). http://www.rand.org/publications/MR/MR1649.

In the concluding discussion of his work *The Transformation of American Air Power* (2000), Benjamin Lambeth mentions that it "would take another book to review the full menu of force development alternatives" facing the Air Force in its attempt to become an air and space force. Three years later, he produced such a book. Nevertheless, the book's subtitle, "Next Steps in the Military Uses of Space," is somewhat misleading. Readers looking for a discussion of future capabilities in military space and of the direction that development might take will be disappointed.

That said, *Mastering the Ultimate High Ground* remains interesting and timely. Lambeth looks at the Air Force and the decisions it faces in the aftermath of the report issued in 2001 by the Commission to Assess United States National Security Space Management and Organization. Formed in 1999 to examine whether the organization and funding of military space accurately reflected its importance to US national security, the commission described shortcomings in the military space establishment and made several recommendations to correct them—many of them involving the Air Force.

Of most importance to the Air Force are the report's findings that an independent military space service is currently unnecessary, that the Air Force should become the Department of Defense's "executive agent" for space (now in effect), and that the Air Force has not done enough to create a "space cadre" of professional officers dedicated to space power. Many of the commission's recommendations have since been implemented; indeed, the report is responsible for most of the reorganization that has recently taken place in Air Force Space Command. Lambeth addresses these changes, outlines the problems and possibilities facing the Air Force, and explains the commission's findings by assessing the role space has played in the Air Force. He also suggests that the Air Force embrace the space mission in the way the commission intended.

Following an introductory chapter, chapter 2—"The Air Force's Struggle for Space"—outlines the history of military space, including interservice rivalries that ultimately gave the Air Force preeminence in this area. Chapter 3, "Air and Space versus 'Aerospace,' " addresses the very interesting and often annoying Air Force conflict concerning the terms *aerospace* and *air and space* (as reflected in the recent changes to the title of this journal). Lambeth describes the birth of the aerospace concept, its reemergence in Air Force doctrine under Gen Michael Ryan, its displacement by the "air and space force" concept, and the effect of this semantic struggle on Air Force thinking about space. The fourth chapter covers "The Space Commission and Its Impact." The remaining chapters explore the relative benefits of two possible focuses of future operations for military space: space control (primarily ground-to-space or space-to-space systems) and force application (space-to-ground systems), as well as Lambeth's conclusions and recommendations to the Air Force regarding the Space Commission's charge to the service.

The author's research is impeccable, and his writing is clear and readable. The fact that *Mastering the Ultimate High Ground* is the first major work to address the Space Commission's report also makes it extremely valuable. The events of 11 September 2001 and the war on terrorism, however, seem to have caused most of the defense community to ignore the report and the importance of its findings. But space will only become more important, and the issues addressed by the commission will not go away. Air Force professionals should read this book to enhance their understanding of their service's role in space, both now and in the future. However, Lambeth's study is not without certain drawbacks.

First, it is already somewhat dated. Even though one finds insightful analysis of the commission's report and its immediate aftermath, the book appeared prior to another significant change in military space organization: the dissolution of US Space Command and the subsequent enlargement of Strategic Command to assume the former's responsibilities. This event is just as important to military space as the commission's recommended changes, especially because the commission recommended that space receive major force program (MFP) status, similar to that of US Special Operations Command. To disband a unified command for space seems inconsistent with the MFP approach. An examination of that decision would have made the book considerably better and more complete.

Second, the book lacks objectivity. Heavily biased toward the Air Force position, Lambeth downplays criticisms of the service in regard to space, a tendency that calls some of his conclusions into question. According to him, for instance, because the

commission concluded that "the Air Force continues to serve responsibly as the military's space custodian" (p. 163), it recommended designating the service the executive agent for space. In actuality the commission advocated many changes in the Air Force, including retooling Air Force Space Command to give the service a clear opportunity to create a cadre of space professionals—something the Air Force had not done by itself. By suggesting executive-agent status, the commission meant to lay the groundwork for a possible Space Corps or separate department—not to ensure it didn't happen. Such bias harms the integrity of the book and compromises the value of its conclusions.

Mastering the Ultimate High Ground presents a superb overview of the history of the Air Force's space organization and doctrine. Unfortunately, its particular slant on the Space Commission report and its effects sometimes marginalizes real concerns by placing the Air Force position in a better light. However, both space professionals and Air Force leaders should read the book since it brings the question of military space once again into the public mind, where it should be.

2d Lt Brent D. Ziarnick, USAF
Schriever AFB, Colorado

Touch and Go

In this section of "Net Assessment," you will find additional reviews of aviation-related books and CD-ROMs but in a considerably briefer format than our usual offerings. We certainly don't mean to imply that these items are less worthy of your attention. On the contrary, our intention is to give you as many reviews of notable books and electronic publications as possible in a limited amount of space.

Red Sky in the Morning: The Battle of the Barents Sea, 1942 by Michael Pearson. Stackpole Books (http://www.stackpolebooks.com/cgi-bin/StackpoleBooks.storefront), 5067 Ritter Road, Mechanicsburg, Pennsylvania 17055-6921, 2002, 224 pages, $24.95 (hardcover).

It's not often that Airmen can read in detail about and glean lessons from a key battle at sea, especially one in which airpower played virtually no role. This particular incident, the Battle of the Barents Sea, was a pivotal fight between the Royal Navy and the German Kriegsmarine. The battle was relatively short-lived and rather intense, covering just a couple of hours of scant twilight in the Arctic winter. The outcome didn't hinge so much on the losses at sea (the British lost a minesweeper and a destroyer; the Germans lost a destroyer; and several other ships on each side were hit). More importantly, the British unknowingly played on Hitler's paranoia over losses of and damage to German capital ships—cruisers and larger vessels. The fact that they hit one of the German cruisers during the course of the battle ultimately sealed the demise of the German capital ships for the rest of the war.

Pearson does a good job of portraying the action without bogging down the reader with details. For example, prior to reading this book, I didn't appreciate the terror of a near miss on a ship. I now know that a near miss at sea will still send shrapnel and splinters into the target, as is the case with airborne flak, often causing extensive damage that may not be immediately evident (I had always thought that the water would mitigate this somewhat). Pearson also reviews naval tactics employed during the battle, explaining the "why" behind decisions and providing armchair-quarterback views of what could've been done better or what might have failed had things gone differently.

The maps and other diagrams are very helpful in keeping the battle's events in perspective. One should also credit Pearson's research for including not only Royal Navy sources, but also information

from the German Kriegsmarine and interviews from German seamen in the battle. Aside from a few inaccuracies (e.g., Teddy Roosevelt was not the president of the United States in 1940 [p. 7]), the book reads well and provides Airmen a good review of naval tactics and valor, as well as a history of a pivotal battle in an oft-forgotten part of the world.

Maj Paul G. Niesen, USAF
Maxwell AFB, Alabama

Dog-Fight: Aerial Tactics of the Aces of World War I by Norman Franks. Stackpole Books (http://www.stackpolebooks.com/cgi-bin/Stackpole Books.storefront), 5067 Ritter Road, Mechanicsburg, Pennsylvania 17055-6921, 2003, 288 pages, $34.95 (hardcover).

According to Norman Franks, *Dog-Fight* "is the story of the development of aerial warfare in 1914–18" (p. 7). He traces the technological development of the fighter and its employment in combat, relying heavily on a chronological presentation of vignettes about famous aces and their machines. Many of these depictions include lengthy quotations by the aces themselves. The book is also richly illustrated with photographs of the pilots and their airplanes, as well as several informative diagrams of formations and maneuvers. Focusing on the western front, Franks writes mostly about the British and their German opponents. He makes occasional references to the French Air Service and its most famous aces, but these are only tangential to the British-German story line and its organizational focus on the Jastas and Circuses. For example, the book makes no mention of the Cigognes (Storks), the elite French fighter group, until near the end (p. 238) and does not discuss the French Air Division, the largest combat-aviation organization of any of the World War I principals, at all.

The American experience receives about 10 pages of attention, the first page of which (p. 197) contains four factual errors: Franks states that Raoul Lufbery commanded the 94th Aero Squadron (he did not); that the 103rd Aero Squadron was equipped with Nieuport 28s (actually, Spad VIIs); that Capt James E. Miller was killed before the 95th Aero received its Nieuports (he was killed afterward); and that Miller led the patrol on which he was killed (Miller followed). Because *Dog-Fight* does not include citations, one can only guess what sources the author consulted in writing this error-riddled page.

Because of its focus on the aces, the discussion of aerial warfare rarely rises above the tactical level. Consequently, the narrative emphasizes aerial victories, thus losing sight of which side achieved aerial superiority and its operational effect on the campaign. The two-page index includes only the names of persons. Air Force professionals interested in the development of fighters and their role in aerial warfare during this period are better served by Richard P. Hallion's *Rise of the Fighter Aircraft, 1914–1918* (Annapolis: Nautical and Aviation Publishing Company of America, 1984).

Dr. Bert Frandsen
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International Order and Individual Liberty: Effects of War and Peace on the Development of Governments by Mark E. Pietrzyk. University Press of America (http://www.univpress.com), Rowman and Littlefield Publishing Group, 4501 Forbes Blvd., Suite 200, Lanham, Maryland 20706, 2002, 272 pages, $44.00 (softcover).

For several centuries, one of the popular ideas in political science has been that democracies do not wage war on one another. Therefore, some people argue that the world needs more democracy if it is to have more peace. Historically, one does indeed find few cases of democracies opposing one another; it is also true, however, that until recently there have been few democracies and fewer still in sufficiently close proximity to fight each other. Peace happens, but democracy may or may not be a cause.

Examining the prevailing view and finding it deficient, Pietrzyk counters with an interesting argument that peace promotes democracy but does not make it inevitable. He spends a great deal of space defining the concepts, the background of the democracy-brings-peace theory, its flaws, and his alternative view that only secure states enjoy the luxury of freedom and pluralism (i.e., democracy). It is not inevitable that one brings the other, though. War promotes authoritarianism and centralization; peace promotes security. Peace can come through collective security, by way of geography that creates natural borders, from the protection of a hegemon, or through isolation. It is independent of the form of government.

Pietrzyk's case studies include the American Revolution, the French Revolution, Germany, and Israel. Interestingly, he uses Israel—an authoritarian,

militarized democracy historically more at war than at peace—as the example that refutes his theory. He points out, however, that it fails to support the other view. The book is provocative in both its thesis and definition of the preconditions that promote peace as well as those that make it unlikely. It definitely warrants close reading.

John H. Barnhill
Tinker AFB, Oklahoma

Round-the-World Flights, 3rd ed., by Carroll V. Glines. Brassey's (http://www.brasseysinc.com/index.htm), 22841 Quicksilver Drive, Dulles, Virginia 20166, 2003, 352 pages, $19.96 (softcover).

On 28 January 1987, *Friendship One*, a United Boeing 747SP, departed Boeing Field, Seattle, and flew around the world in a record time of 36 hours, 54 minutes, and 15 seconds. It covered 23,125 miles at an average speed of 625 mph. The comfortable flight included hot meals, bathroom facilities, and in-flight movies. The pilots worked the radios, charted the flight path, and tried to stay in smooth air with the wind at their backs. Navigation never became a problem, and the aircraft had plenty of fuel to reach its destinations. In addition to this record-setting endeavor, Carroll V. Glines's *Round-the-World Flights* also tells more dramatic stories of sacrifice, discomfort, and danger—of open cockpits, crashes, bad weather, fuel starvation, innovation, adaptation, and lots of luck and skill.

Glines begins in 1924 with the first round-the-world flight. Two of the four Douglas World Cruisers that began the trip completed their epic journey 175 days later. This third edition of the book adds, among others, stories of several round-the-world firsts: a nonstop balloon flight, nonstop solo balloon flight, and motor-glider flight. It also includes round-the-world speed records in a home-built airplane and the trip of a Lockheed Electra 10E that commemorated Amelia Earhart's last flight.

Glines offers up an amazing number of aviation achievements—round-the-world firsts; speed records; and flights by helicopters, balloons, home-built aircraft, business jets, airliners, and more. Each chapter puts the events in historical perspective and tells the story behind the particular accomplishment. As an anthology of notable aviation achievements, it serves its purpose well, including many pictures and riveting quotations from the actual flyers who lived these adventures. Told in a captivating manner, the stories leave readers wanting more—more details about individual personalities and their motivations and experiences.

Round-the-World Flights is a good starting point for historians looking for stirring aviation adventures and their place in history. It is also a wonderful reference for flyers and dreamers who may have their own aspirations to circumnavigate the globe.

Maj Scott Drinkard, USAF
Colorado Springs, Colorado

The Lancaster Manual: The Official Air Publication for the Lancaster Mk I and III, 1942–1945 edited by Dr. Michael A. Fopp. Greenhill Books/Lionel Leventhal Limited (http://www.greenhillbooks.com), Park House, 1 Russell Gardens, London NW11 9NN, 2003, 532 pages, £25.00 (hardcover).

As director general of the Royal Air Force Museum at Hendon, outside London, Michael Fopp is well equipped for the task of assembling the elements of Air Publication 2062A and C—*The Lancaster Manual*. Obviously, this is a highly technical publication intended for operators of the two principal versions of the famous Lancaster heavy bomber: the Mark I and Mark III. It will appeal to those readers who thirst for thoroughgoing and highly detailed knowledge of this important component of the Combined Bomber Offensive.

The first three of the manual's 11 sections cover matters pertaining to the flight crew, including controls, equipment, and particulars for the flight engineer and various crew stations. Instructions for the ground crew in section four occupy more than 140 pages. The remaining sections detail the repair and servicing of electrical and radio equipment, the design and construction of the airframe itself, and the particulars of the hydraulic and pneumatic systems. The last section treats armament and general equipment. All of these sections include many illustrations of aircraft and equipment; photos; data tables and guidelines for repairs and engine removal; and electrical schematics, to name a few. All in all, anything anyone ever wanted to know about the inside of a Lancaster is here for casual browsers or would-be restorers of a Lancaster—if they can lay hands on one!

Dr. James A. Mowbray
Maxwell AFB, Alabama

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