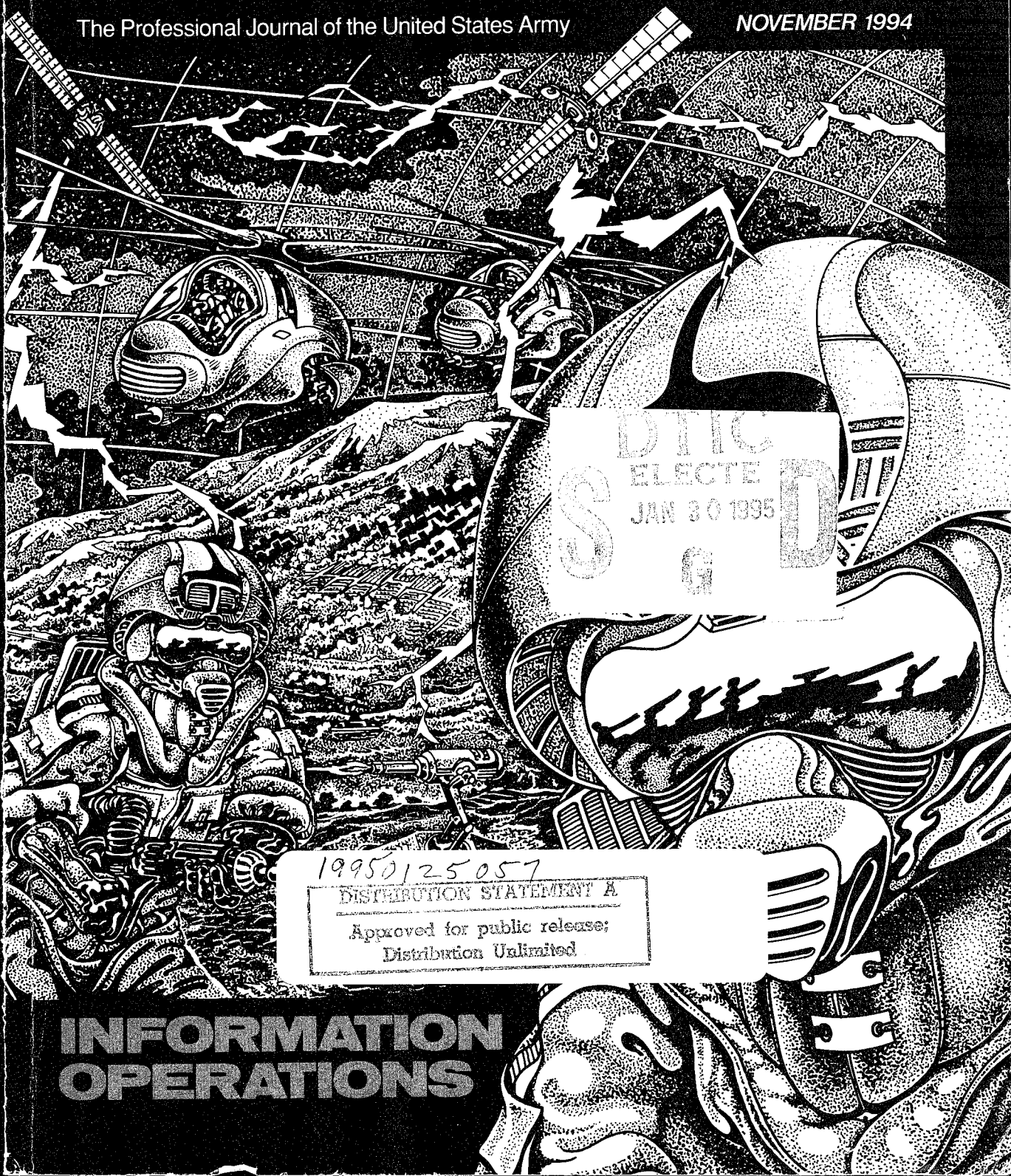


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MILITARY REVIEW's Mission is to provide a forum for the open exchange of ideas on military affairs; to focus on concepts, doctrine and warfighting at the tactical and operational levels of war; and to support the education, training, doctrine development and integration missions of the Combined Arms Center and Command and General Staff College.

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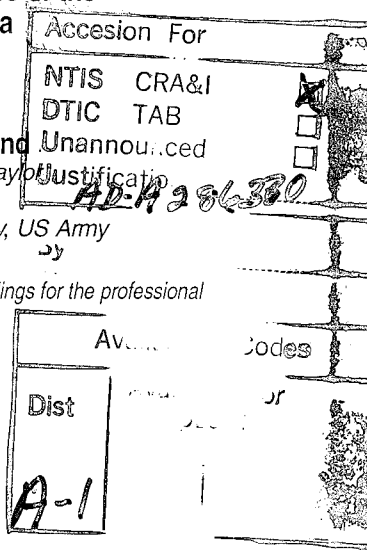
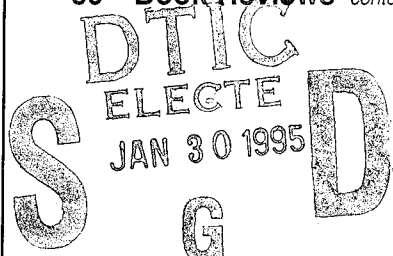
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From the Editor

To most of our readers, "information operations" may appear to be only a buzzword and not a definable, coherent "something." This confusion is understandable because information operations is an umbrella label for a variety of systems, processes, internettted tasks and potential strategic or operational objectives as well as an approach to achieve interoperability among joint forces. There are many important new concepts within information operations. The concept of Global Information Systems, for example, now forms a triad with the more familiar notions of Friendly Information Systems and Adversary Information Systems. This macro-concept presents a commander now with three—not two—independent information entities in his battlespace. Our first article, "Public Affairs and America's 21st Century Army," by Major General Charles W. McClain and Major Garry D. Levin, describes the vision of the public affairs evolution to support the commanders of Force XXI and give them the tools they need to deal effectively with the third independent variable of future operations.

Our second article, by Brigadier General Morris J. Boyd and Major Michael Woodgerd, provides an overview of how "Force XXI Operations" reconceptualizes and redesigns the Army at all echelons. This article also explains the purpose and driving force behind the 1 August 1994 TRADOC Pamphlet 525-5 of the same name. The bottom line is that knowledge is power. In Second Wave warfare, transferring knowledge to commanders requires intensive equipment and manpower resources that develop in progressive, linear processes. In Third Wave warfare, however, knowledge is produced more quickly and distributed throughout the organization to achieve greater effects. In combat, this new form of knowledge generation enables a selective and rapid generation of real combat power that is a step beyond the force-oriented style of AirLand Battle and the transition concept of capabilities-based operations in the 1993 US Army Field Manual 100-5, *Operations*.

Our remaining articles and essays examine how to harness the benefits of information operations. The battle command concept, for example, provides the keys to unlocking the potential of information operations as a force multiplier and understanding knowledge-based warfare in relation to its force- and terrain-oriented predecessors. The essence of battle command is its expression of the will of the commander in thought and action. Colonel Jeffrey B. Jones and Air Force Colonel Richard Szafranski offer new ways to look at the psychological elements of Force XXI operations. We are excited about the wealth of ideas in this issue. I hope each reader of this issue captures new approaches to realizing that the successful commanders in the information age will be those who best understand the dynamics of battle and can express their vision of that contest through effective command and control while leading and inspiring their forces in the physical and moral conflict with the forces of the enemy and their commanders.

JWR

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MR Letters

If It Ain't Broke . . .

Lieutenant Colonel Mark Gerner's article, "The Draft in Reverse: The Training Base and the Individual Ready Reserve," in the July 1994 issue was thought provoking. As he hoped, the article has already caused some dialogue, especially in the 70th Division (Institutional Training). Unfortunately, the dialogue is focused on a "nonproblem."

It was obvious to all who took part in the very limited call-up of the US Army Reserve (USAR) for the Gulf War that my component was absolutely necessary for the successful prosecution of what could have been a very bloody war. Whatever the branch or service, vital Reserve Component (RC) assets were needed. All units were ready to go to war within the allotted mobilization and deployment dates—yes, even the combat units of the Army National Guard (ARNG). Although they were not ready to deploy the day of mobilization, this does not mean, nor was it the case, that they were not ready when they were supposed to be. Egos be damned, there was a schedule, and we met it!

Gerner's facts about the training divisions are misleading, if not wrong. The 70th sent one complete training brigade, not two. In addition, it sent a second training brigade headquarters and a training support brigade. The training brigade, as with all units deployed, was tailored to meet requirements. It was not sent "as it was."

The 70th prepares the complete training package for infantry one station unit training (OSUT). The Individual Ready Reserve (IRR) RT-12 (recently trained—last 12

months) requirement the 70th was eventually tasked to execute was not difficult, once it was decided by Headquarters, US Army Training and Doctrine Command (TRADOC), how it was to be done.

Prior to Lieutenant General Fredric J. Brown's efforts in the mid-1980s, we did not know who was in this group, much less what kind of training they would need. Gerner says, "it took a significant amount of time [for the 70th] to begin its IRR training role." This was not because of a USAR training brigade problem, nor was it a reflection on the abilities of the USAR drill sergeants and their leaders. The decisions concerning the "what, when, where and how many" of the training to be conducted were made many levels above ours, well outside our span of control.

Conceptually, it would be a mistake to relegate USAR training divisions to basic combat training (BCT) only. I believe it is necessary to keep the entire range of soldier qualifications alive in the USAR, if for no other reason than to keep the ARNG up to standard. The Active Component (AC) must have a source for individual shooters to call from without having to start at "zero" week or call up complete ARNG commands. These USAR training divisions provide this source, and much more.

As full partners under the Pro-Train Infantry OSUT program developed and in operation at Fort Benning, Georgia (after Gerner's time), the USAR in peacetime is training infantry soldiers throughout the year. The USAR trains 100 to 200 infantry soldiers per cycle, or 300 to 600 per training year.

These soldiers are both AC and RC. This workload represents a fraction of what can be done in an "inactive" duty status by one USAR training division.

The quality of the training received by these soldiers attending initial entry training (IET) is no different from that received in an AC infantry training company. No matter which component drill sergeants come from, they meet the same standards. Gerner's comment that "any future contingency will again preclude the deployment of those [active duty drill sergeants] in the training base" is simply not valid. Individual replacements should first come from the AC training cadre. If they are our best, and they are, they have to be out there performing as combat multipliers. This is especially true when the USAR cadre can, and does, train IET soldiers to the same standard as AC drill sergeants.

There has been great improvement in the RC battalion's capability to execute the advanced individual training portion of infantry OSUT. In all cases, this mission can be done to standard if inactive duty field training is conducted. More important, leaders must emphasize its importance—and we are.

It would be a very big mistake to limit training divisions to the BCT portion of the OSUT because of the break it would make in the doctrine of the "Total Army." Additionally, due to the fiscal, training and manpower limitations we will be operating under from now on, it would be very hard to put back together.

The concept of an AC training battalion drawing its trainer or drill

sergeant from a "specified Active division" to service the division's future needs may sound like a good way to solve the often asked question in the field of "who trained this soldier," but it will not work for the same reasons stated above. More important, to even try to do this would destroy the centralized TRADOC system of tasks, conditions and standards now uniform throughout the branches (modified only in very special instances).

This system has gone to great effort to make the many functions uniform, ranging from personnel management through tactical and logistic operations. Although not perfect, the functions are definitely now more understandable to all. Interposing combat divisions of the line directly into soldier IET would again throw the system into chaos. Additionally, the amount of bureaucracy would be multiplied by however many line divisions the Army might have at the time. The current method has proved to be the most efficient, effective and economical, restated in terms of mass, unity of command and economy of force.

The other major problem with division affiliation concerns the military "art" disciplines of combat, combat support and combat service support. We have centralized combat arms training, such as OSUT, at Forts Benning, Knox and Sill. Will other branches get division-level drill sergeants? Will we have finance OSUT division-level training battalions? Will we increase the tail-to-head ratio? Will we have to increase the combat force structure to justify our training base? If so, this, in my opinion, is backward. Are we trying to increase the total size of the Army? That is what the end effect would be, especially if there would no longer be any combat arms USAR soldiers (that is, individual soldiers) to fill the gap between the initial outbreak of hostilities and unit replacement.

Gerner's article exemplifies the tendency of a peacetime Army to create and solve nonproblems in possibly devastating ways. The suggested concept fails to consider the permanent changes that have taken place since Gerner left (such as Pro-Train) and current Total Army doctrine. Even if there are problems, they certainly can be fixed at a lower level and without much of the time, effort and general confusion Gerner's proposal would cause.

The Gulf War was not within the paradigm developed during the Cold War in regard to training base mobilization. However, with only minimal adaptability and synchronization (the 3d and 4th tenets of AirLand Operations doctrine), the system in place worked well during the war. This was true even after cannibalizing or reassigning many units' equipment and personnel to other AC and RC units (as retired Lieutenant General Thomas H. Tait will and has verified).

We need our best soldiers, wherever they are currently assigned, ready to fight a different type of war and to win it quickly, with the fewest casualties. Like it or not, this also includes doing it at the lowest dollar cost possible. The current system works—don't fix it.

COL Joseph C. Kopacz, USAR, Commander, 4th Brigade (Infantry), 70th Division (Institutional Training), Camp Atterbury, Indiana

Military-Media Brouhaha Media Forfeited Soldiers' Trust

The defense of the media by Lieutenant Colonel Terence J. Daly in his letter "MACV versus Peter Arnett" (August 1994 *Military Review*), while rather unique, seems to me a bit misguided. I had little contact with the press in the Korean War, but my experiences in Vietnam were diametrically opposed to Daly's observations.

Daly states that many of the "idealistic young journalists" got

the bulk of their information from hotel bars, but that is just what they got—bar talk. Few of those young idealists, including some award winners, got more than a few kilometers from their hotels.

Trust is a two-way street, and the media forfeited most field soldiers' trust because they never got to the field and much of what they reported was fabricated. In 1968, the 173d Airborne Brigade conducted a three-day sweep with the 22d Division of the Army of the Republic of Vietnam between Qui Nhon and Bong Son. The most exciting thing that happened was the test firing of weapons. Later at the officers' club bar, I ran across the wire service correspondent who covered the story from our headquarters and I chided him about his article because it told of terrible battles. He told me that if he reported what actually went on in Vietnam, the wire service would not pay to keep him there.

Another example is from 1969. My mother sent me a major wire service clipping with the headline, "Communist Gunners Smash Giant US Base at Long Binh." I could not recall any such event, so I checked the daily log for that date and discovered that the "smash" consisted of three rockets, all of which hit open areas. Long Binh, after all, covered some 40,000 acres. Accuracy, clarity, completeness—I don't think so!

When journalists live up to their creed, perhaps they will once more gain and maintain the military's trust. As long as the media continue to pursue sensationalism at the expense of accuracy, I suspect there is little we can do to decisively influence the convictions of a press that seems to instinctively distrust the military.

The lack of trust is not strictly a military problem. I spent the night and day of the Three-Mile Island incident in Harrisburg-Fort Indiantown Gap, Pennsylvania. It, like the 1968 Tet offensive, was

largely a media event.

COL Kenneth C. Suhler, USA,
Retired, San Antonio, Texas

Military Should Seek High Ground

I appreciate Colonel Kenneth C. Suhler's articulate and insightful comments. Any person or group claiming a higher code of ethics, however, had better live up to it. To be charitable, US military reporting "accentuated the positive" throughout the Vietnam effort. Sure, some reporters dogged it. The media, like the military, are made up of individuals of widely varying character, ability and integrity. If the military at all levels honestly tries to demonstrate candor, courage, competence and commitment, though, the good ones in the media will respond, and maybe some of the media trust the military and political leadership forfeited in Vietnam could be regained.

Moral and ethical obligations aside, we do not really have any choice. Suhler has one thing backward: the media do not *have* to earn the military's trust. The Constitution we swore to protect and defend gives the media the freedom to publish whether we like it or not.

LTC Terence J. Daly, USAR,
Retired, Incline Village, Nevada

Let's Agree to Disagree

I would add yet another spin to the ongoing discussion regarding the schism between the military and the media. By reading the various letters *Military Review* has published on this subject, one could easily chart the attempts by both parties to seize the moral high ground. Yet, I have found that arguments which support or demean the moral character and dedication of the two organizations tend to solve little. One can use examples of unethical behavior to support both arguments, again, to no avail. Frankly, this discussion reminds me of the beer commer-

cial where half the players yell "less filling" while others counter with "great taste."

During my four years as a military-media relations instructor at the US Army Command and General Staff College, Fort Leavenworth, Kansas, I either engaged in or observed many discussions regarding the role of the media. These discussions, like the letters in *Military Review*, were usually interesting, yet seldom reached anything that could be termed a definitive solution to this problem.

One argument that usually survives these collective tests of logic is that the military and the media see the world differently. Military leaders should and do fiercely safeguard their right to protect their soldiers' lives by restricting the flow of sensitive information, while journalists, citing the First Amendment and the public's right to know, are paid to publish. Unfortunately, both parties are unwilling to view issues from the other's perspective.

I am not saying that journalists do not care about soldiers or their security—simply that their job is to provide information that is both timely and interesting. This difference has driven and will continue to fuel this rift. The truth is that in a conflict situation, both parties will usually line up on opposite sides of the disclosure issue.

The best solution to this dilemma is to accept that the law, as we know it, ensures that the media will continue to cover military operations and that their coverage will continue to test the military's patience and authority. Only through training can soldiers learn how to best conduct their operation and support the media.

Like it or not, the media are the military's best conduit to the American people. While this channel is far from perfect, the American people still rank the military as their most trusted profession. Both sides need to stop bick-

ering and devote this energy to education and planning. Both need to understand their basic differences and, then, plan for them.

LTC John Barbee, USA, Retired,
Lansing, Kansas

Just Say No to Regiments

Major Paul B. Malone IV's recommendation in "Regiments to the Rescue" (August 1994 *Military Review*) to "regimentalize" infantry divisions is flawed in several respects. First, the difference between regiments and brigades is purely semantic today. All light and heavy units are task organized based on mission. We have been preaching integration of light and heavy forces for years. We teach it in the officer education system, base assignment decisions on it (the light-heavy imperative career path for company grade officers) and practice it at light-heavy rotations at both the National Training Center, Fort Irwin, California, and the Joint Readiness Training Center, Fort Polk, Louisiana. The only difference between Malone's recommendation and current US Army practice is that it is the corps commander's responsibility to tailor the force, not the division commander's.

Second, it is historically and currently true that there is not enough strategic lift to transport heavy forces quickly. Malone's proposed solution to send the regimentalized division's light brigade to secure the area for the later arriving heavy brigades is what we do right now. We send elements of our airborne or light divisions to secure the area, with elements of our heavy divisions to follow. Our specialized divisions have become highly proficient at deployment operations. The 82d Airborne Division is the worldwide reaction force par excellence. Could a division with both light and heavy units conduct the daunting task of

loading both types of regiments for deployment simultaneously? The example of the Pentomic divisions is instructive when we demand that our divisions be able to "do it all."

Third, it is true, as Malone says, that specialized soldiers need specialized training. But to separate the dismounted infantry from the vehicles is a mistake. The dismounted infantry must train with the vehicles if we expect them to replace casualties in the vehicle's crew, operate safely around vehicles and be masters of coordination when vehicles and dismounted infantry attack together. Further, creating a dismounted regiment creates a new set of company commanders. Which captain will be in charge when the mission calls for dismounted infantry to operate as mechanized infantry—the captain commanding the vehicles or the one commanding the dismounted infantry? Currently, one commander is responsible for both. This prevents confusion and fixes responsibility.

Finally, in comparing eight current divisions and eight regimentalized divisions, Malone indicates that there will be more mechanized forces left under his scheme after the drawdown. This is true if merely changing the table of organization and equipment (TOE) would produce the budgetary savings the US Congress is demanding. However, money is saved when equipment and personnel are cut. No matter what TOE the Army operates under, its equipment and personnel density will be a function of funding.

Leave the infantry divisions specialized so that both the light and the heavy forces continue to have the best-trained soldiers in their respective fields. Leave the re-sponsibility of task organizing the force to the corps or joint task force commander. This will allow division commanders to focus on training. Finally, continue the emphasis on light-heavy training at

the Combat Training Centers.

**CPT Gabriel Eszterhas, USA,
C Company, 1st of the 38th Infantry,
Infantry Training Brigade,
Fort Benning, Georgia**

Regiments, Powered to Win

In response to Captain Gabriel Eszterhas' criticism, the main point of my article is that the current downsizing scheme is not the most efficient, and may not be an effective method to achieve our future national security needs. As was true when I originally wrote this article in the Spring of 1993, the eventual drawdown end strength is still unknown. It will be much lower than any of us imagined. Even now, some divisions remaining in the Active force are manned well below their doctrinal structure. Some, for example, are missing entire brigades, with their platoons missing squads.

The US Army has accomplished many light contingency missions recently, yet only three light brigades from the 10th Mountain Division (–) and the 9th Infantry Regiment have been available in the Continental United States (CONUS) to support such missions. With "regimentalized" divisions, the Army could spread these contingency missions throughout the divisions in the CONUS-based Army. Reserve Component forces could backfill deployed regiments. Spreading the burden and reducing the operational tempo of any single division might curb some morale problems caused by back-to-back deployments.

Eszterhas first argues that the difference between my regiments and current brigades is merely semantic. He argues that my proposal does nothing to improve the interoperability of light and heavy forces. Second, he claims I have ignored the strategic lift limitations to deployment. Third, he believes that the dismounted infantry must train with their vehicles to accomplish the mission. And, fourth, he

contends that we cannot afford the force structure I advocate. I will address each of his points in turn.

First, my definition of a regiment is a unit composed of like battalions (infantry, armor or field artillery) under a numbered headquarters (such as the 9th, 327th and 504th) that is not task organized for combat. A brigade would be formed of mixed or like battalions that may or may not be task organized for combat. Thus, a regiment may also be a brigade; however, a brigade is not necessarily a regiment.

The interoperability of light and heavy forces may have been preached and practiced for years, yet it still does not work well. The differences in survivability, firepower and mobility make these forces incompatible on the modern battlefield. When given the opportunity to operate light and heavy forces together during Operation *Desert Storm*, the Army chose not to do so. The light forces operated well to the west and behind the heavy forces because they could not keep up, were too vulnerable and had too little firepower. Had armored vehicles with crews been provided to the 82d Airborne Division instead of to the Army National Guard truck units, the 82d could have obtained maneuver proficiency within a short period and could have provided much greater combat power to XVIII Airborne Corps. The heavy forces experienced shortages of infantry soldiers for the breach operations and for clearing operations. Regimentalized divisions would have prevented both problems.

All commanders have the responsibility to tailor the force using mission, enemy, troops, terrain and weather, and time available. This ensures that the force is resourced for success.

Second, units already deploy their troops by air whenever possible and the bulk of their equipment by sea. Regimentalized

continued on page 75

PUBLIC AFFAIRS

in America's 21st Century Army

Major General Charles W. McClain Jr., US Army, and
Major Garry D. Levin, US Army

As America's Army enters the 21st century, it faces new challenges and changing national security priorities at home and abroad. As doctrine and strategy adjust to a changing force structure, information communication technologies will have an immediate impact on the conduct of operations. Vision 2000 is the Army's innovative response to the technological advances and global media challenges awaiting future battlefield commanders. The authors share their views on emerging public affairs capabilities that will be essential to support America's Army in peace, conflict and war.

WE LIVE in a turbulent world of broad social and political change. Each day, national and international developments affect the United States and its people. These developments have resulted in new challenges and new threats and have altered priorities for the nation, to include the Department of Defense (DOD).

America's Army recognizes these changes. It has expanded its keystone doctrine as a result of the end of the Cold War, ambiguous regional threats and changing international alliances and dynamics. US Army Field Manual (FM) 100-5, *Operations*, describes a strategic force-projection Army prepared to fulfill its obligations across a continuum of military operations. It prescribes an Army rapidly able to alert, mobilize and deploy forces from the Continental United States

(CONUS) and forward-presence theaters to conduct joint, combined or interagency operations anywhere in the world. It presents principles for the conduct of war and for the conduct of operations other than war (OOTW).

The Public Affairs Environment

FM 100-5 also states that America's Army must prepare to operate in an evolving, high-tech, influential global media environment. It implies that emerging information communication technologies and media capabilities are having an impact on the conduct of operations equal to that of emerging weapons technologies. "The people thinking the hardest about warfare in the future know that some of the most important combat of tomorrow will take

place on the media battlefield.”¹

Telecommunications equipment has rapidly become more sophisticated and widely available, allowing ever-greater numbers of independent media representatives to be present throughout an area of operation from the start, if not prior to the start, of operations.

The proliferation of commercial satellite technology and the expansion of international satellite alliances have also contributed to the spread of instantaneous

worldwide communications. Media coverage can originate from anywhere within a troubled region, even as the National Command Authority is deciding on appropriate responses or while deployment is taking place. From Panama to Macedonia, the media’s

ability to provide detailed, graphic and live coverage of events is already influencing operations. It is compressing time and space so that what happens on the ground immediately impacts on strategic decision making. Bridging the gap between strategic and tactical levels, it is causing strategic decisions to affect tactical execution almost instantly. The media’s expanding capability is making it possible for a tactical victory to be an operational or strategic loss—and vice versa.

As technology enhances the ability to provide information, it also facilitates the consumer’s ability to get information. Ever smaller, more portable, more affordable, more powerful radios, televisions, telephones, computers, fax machines and other communications devices enable audiences throughout the world—including our deployed forces and actual or potential adversaries—to receive a wider range of information from a vastly expanded spectrum of sources. This has led to military operations becoming spectator events watched in real time by the American public, allies

and enemies—indeed by the whole world.

“Instead of a handful of centrally controlled channels watched by all, vast numbers of people will eventually gain access to a dazzling variety of over-the-border messages.”² The need to fill more channels with more information causes media competition to find and tell unique stories. This can lead to unorthodox and sensationalistic reporting. It often results in increased analysis, critique and editorial commentary

about the events occurring in an area of operation, the impact of those events, reactions to those events and the potential outcome of those events. Media personalities, politicians, pundits, critics, academics and armchair quarterbacks of every bent become active participants in the debate.

As a result, public institutions, private enterprises and special-interest organizations can more rapidly shape and change public opinion. They may quickly reinforce or undermine confidence in the force. They can pressure or influence the nation’s political leaders. They might strengthen or weaken soldier morale and the Army’s organizational climate. They have the ability to affect strategic goals, operational objectives and tactical execution, thereby significantly impacting the strategic direction, range and duration of military operations.

Public Affairs (PA) Vision for the 21st Century

Army PA recognizes the significant impact emerging information technologies and the evolving media environment are having on operations. PA officers (PAOs), PA noncommissioned officers (NCOs) and PA Department of the Army civilians understand that future operations will attract wide media attention. They know that America’s Army will not be able to exclude or control media coverage and

***The Public Affairs Mission
is to fulfill the Army’s obligation to
keep the American people and the
Army informed and to help establish
the conditions that lead to
confidence in America’s Army and its
readiness to conduct operations in
peacetime, conflict and war.***

that attempts to do so will be counterproductive to US strategic and operational interests.

PA professionals realize that America's Army cannot take a passive approach to the evolving global media environment. They know that the

"Strategic vision is essential to any organization that seeks to adapt successfully to the requirements of the future. A vision—especially one that is developed during turbulent times—must provide a focus for the institution and its leaders while simultaneously fostering innovation and intellectual vitality. Both the broad membership of the institution and, most importantly, its leaders must be committed to the vision and committed to accomplishing it."

Army and the PA community must focus on the future and adapt to a changing environment based on strategic vision.

"Strategic vision is essential to any organization that seeks to adapt successfully to the requirements of the future. A vision—especially one that is developed during turbulent times—must provide a focus for the institution and its leaders while simultaneously fostering innovation and intellectual vitality. Both the broad membership of the institution and, most importantly, its leaders must be committed to the vision and committed to accomplishing it. Lacking a strategic vision, an organization will tend to rely on old milestones—the next budget, the crisis of the moment or a specific operation—to guide its journey to the future. Moreover, it will tend to evaluate itself at each step by looking backwards—using an old, comfortable, and irrelevant paradigm to judge its progress."³

Vision 2000, Public Affairs into the 21st Century takes an open-minded, broad approach to the business of PA and will foster the innovation and intellectual vitality that Army Chief of Staff General Gordon R. Sullivan advocates. *Vision 2000* is an analytical framework that focuses on

the PA capabilities essential to support America's Army of tomorrow in peace, conflict and war. It is a long-range umbrella concept that establishes a basis for modernization.

The PA vision does not define a final end state or a precisely correct solution. Rather, it presents the foundation from which the Army and the PA community will make the informed choices necessary to change Army PA so that it is best able to support America's Army of the future. It identifies issues that must be addressed to maximize the PA battlefield return on investment—to conduct PA operations more efficiently and more effectively in tomorrow's re-focused, restructured Army and dramatically changed global media environment.

Vision 2000 is a fresh perspective by which the Army thinks about, plans and conducts PA operations. It recognizes that everything the Army does, or fails to do, is of potential interest to key internal and external audiences. It acknowledges that America's Army is accountable to the American people and is founded on the belief that confidence in America's Army, its readiness and its execution of war and OOTW derives from an informed citizenry and an informed organization. It focuses the PA mission on assessing information requirements and expectations, anticipating information impacts and developing information strategies as part of the planning and decision-making process at the strategic, operational and tactical levels.

That the American people and members of the Army community have a right to know about Army policies, positions, procedures and operations is a generally accepted belief. A more important concept, however, is that America's Army has an obligation and a vital interest in ensuring that the American people and members of the Army community are informed about its policies, positions, procedures and operations, appropriate with mission and national security.

These key audiences must understand the Army to have confidence in the Army force. By proactively providing information, America's Army enhances that understanding and earns that confidence. This is fundamental to the

Reporters covering US and Honduran "Redlegs" during exercise GOLDEN PHEASANT, March 1988.



The media's ability to provide detailed, graphic and live coverage of events is already influencing operations. It is compressing time and space so that what happens on the ground immediately impacts on strategic decision making. Bridging the gap between strategic and tactical levels, it is causing strategic decisions to affect tactical execution almost instantly. The media's expanding capability is making it possible for a tactical victory to be an operational or strategic loss—and vice versa.

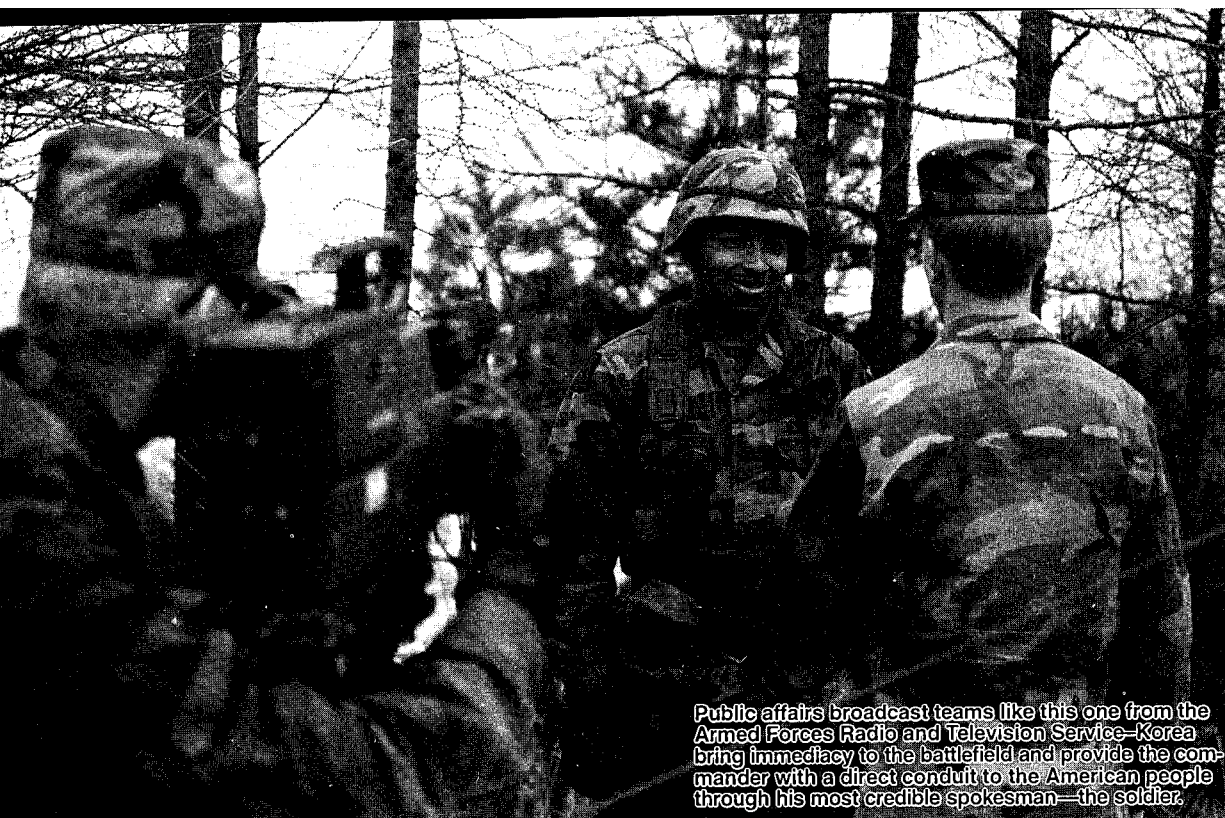
Army's ability to accomplish its mission successfully, especially when the political decisions or national policy basis for the mission is particularly contentious. This is true because Army planning, decision making and execution are influenced by the public's, soldiers' and their families' and the nation's political leadership's perception of how it conducts its affairs in accordance with national values.

Providing information and earning confidence also impacts the morale, esprit and effectiveness of the force. It enhances soldier dedication and discipline, contributes to ethical behavior and respect for the law of war and enhances the will to win and mission accomplishment. This strengthens the Army's ability and the nation's resolve to deter aggression.

To accomplish the PA mission, *Vision 2000* has established eight strategic PA goals. These goals identify the optimum conditions for the successful accomplishment of the PA mission and are applicable across the full continuum of Army operations and activities. Attainment of these goals is the basis for all PA strategy development and PA operations planning:

- Accurately assess the information needs and perceptions of internal and external publics.
- Fully integrate PA estimates and recommendations into the planning and decision-making process at all levels and across the continuum of operations.
- Achieve open and independent reporting and access to units appropriate with the mission and national security.
- Expedite the flow of complete, accurate and timely information about the Army.
- Achieve a balanced, fair and credible presentation of information about America's Army.
- Communicate the Army perspective to all audiences.
- Educate and train all leaders and soldiers on their PA roles and responsibilities.
- Achieve full integration of PA and related functional areas and institutionalize effective joint, combined and interagency PA operations.

The PA vision describes what Army PA must be if it is to support decisive victory across the continuum of military operations, contribute to the fulfillment of the national military strategy and preserve, protect and advance the vital



Public affairs broadcast teams like this one from the Armed Forces Radio and Television Service—Korea bring immediacy to the battlefield and provide the commander with a direct conduit to the American people through his most credible spokesman—the soldier.

The PA force structure must be reengineered for America's Army of the 21st century and the global media environment in which it will operate. . . . This may require . . . develop[ing] a quick-reaction or rapid-response PA advisory team. Their mission is to provide immediate PA guidance and support in high-visibility, high-interest and emergency situations, and procure the necessary type-classified, deployable, maintenance-supported, cyclically upgraded modern equipment PA elements require.

interests of our nation. It requires maintaining a proper balance among the six imperatives of doctrine, leader development, modernization, quality people, training and force mix. The PA vision defines the essence of Army PA:

A trained, readily deployable Total Army force of PA professionals, sufficiently resourced, technologically capable and modularly organized to conduct operations in peace, conflict and war and maintain a timely flow of accurate, balanced information to the Army, the American public and other key audiences.

Fulfilling the PA Vision

In some cases, specific programs to accomplish the PA mission, achieve the PA strategic goals and fulfill the PA vision have been implemented based on lessons learned and field experience. Complicated, intensely managed, extensively coordinated, long-term programs

must be initiated through the Enhanced Concept-Based Requirements System. Doctrine, training, leader development, organization, materiel and soldier initiatives must be pursued. This is not a simple process with a clear starting point and a defined end state, but a dynamic process in which changing any one of the dependent elements affects all of the others. For Army PA to transform for the 21st century, six imperatives must be addressed.

Define the critical PA responsibilities and functions. PA has been traditionally classified as part of personnel service support or the "sustaining soldiers and their systems" subset of the logistic function or subsumed under other information management functions. In the evolving media environment, PA must become a distinct function of command. On the battlefield, it is as essential an element of mission success, as important a combat multiplier and as critical a

component of building and sustaining combat power as any of the Battlefield Operating Systems, especially when the global media is a significant element of battlespace.

PA cannot continue to operate primarily from the rear area. To provide commanders with the support they need, PA planners must be integrated into plans and operations cells so they can identify emerging trends, issues and concerns, conduct assessments and develop strategies which support the goals and objectives of the operation. PA personnel must operate from the vicinity of the main command post so they can immediately react to situations, events, occurrences and issues with significant PA implications for the commander and his staff. They must locate forward, where they can most effectively interface between media representatives and soldiers, units and the operations that they will want to cover.

It is no longer sufficient to evaluate PA effectiveness based primarily on product output—the number of queries answered, press releases and stories written, electronic news products created, field newspapers printed or hours of radio and television broadcasts. The processes and methods of measuring the results of PA efforts must be enhanced and expanded to evaluate outgrowths—understanding and retention of messages—and outcomes—changes in opinions, attitudes and behavior. PA personnel must continually measure and evaluate the effectiveness of PA plans and operations, refine current operations and conduct future planning.

Commanders and the PA community must avoid the artificial boundaries and distinctions associated with the terms *command information*, *public information* and *community relations*. In the evolving global media environment, the information provided to one audience must be considered information available to all audiences. The information made available to members of the command will rapidly become available to the public; the information reported by the global media will be readily accessed by members of the command. PA personnel, therefore, must plan and execute from a

holistic perspective. They must design and implement coordinated strategies that consider information communication to all audiences and through all channels of communication in a synchronized manner.

Although Army PA will always have to retain a production capability, commanders and PA personnel must examine alternatives to media

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product creation in developing their information communication strategies. They must be prepared to coordinate with other Army elements or contract with commercial vendors for print production, publication and distribution and audio or video production, transmission and reception. This is especially true when such alternatives are more resource efficient and mission effective.

Educate leaders on PA significance. Many of the Army's most senior leaders already understand the linkage between PA and national strategic goals, theater strategic and operational objectives, and operational and tactical execution. They know that effective PA operations are critical to the determination and achievement of the strategic end state. They "understand all too well that wars can be won on the world's television screens as well as on the battlefield."⁴

However, all leaders must understand that the perception of an operation can be as important to success as the execution of that operation. They must recognize that information technology and the evolving media environment are blurring

the distinction between the strategic, operational and tactical levels.

Leaders must also understand that attempting to impose limits and restrictions on media representatives will be increasingly difficult and ineffective. They must realize that if they deny

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They must realize that if they deny access or impede the filing of stories, reporters become suspicious, distrustful and alienated. This leads them to find alternative sources of information and often results in the publication of speculation and inaccuracy.

access or impede the filing of stories, reporters become suspicious, distrustful and alienated. This leads them to find alternative sources of information and often results in the publication of speculation and inaccuracy.

Not all news is good news, and frequently stories will not be favorable to the Army or command. "Bad news gets worse with time. If an attempt is made to mask the truth, the masking itself becomes a story, and the original bad news eventually comes out anyway—but worse! It is better to tackle tough issues promptly and truthfully within legal, operational and proprietary bounds. The wisdom of this approach, and the destructive results of the opposite, have been validated repeatedly. While we can't always expect favorable reporting, we should expect fair, balanced reporting. The best way to maximize fairness on the media's part is to be fair with them."⁵

Throughout the Army, a concerted effort must be made to promote an attitude of mutual cooperation between the military and the media. Every effort must be made to eliminate the perception that the media's purpose is to undermine, interfere and criticize. Commanders must know that the best approach is to be proactive, to

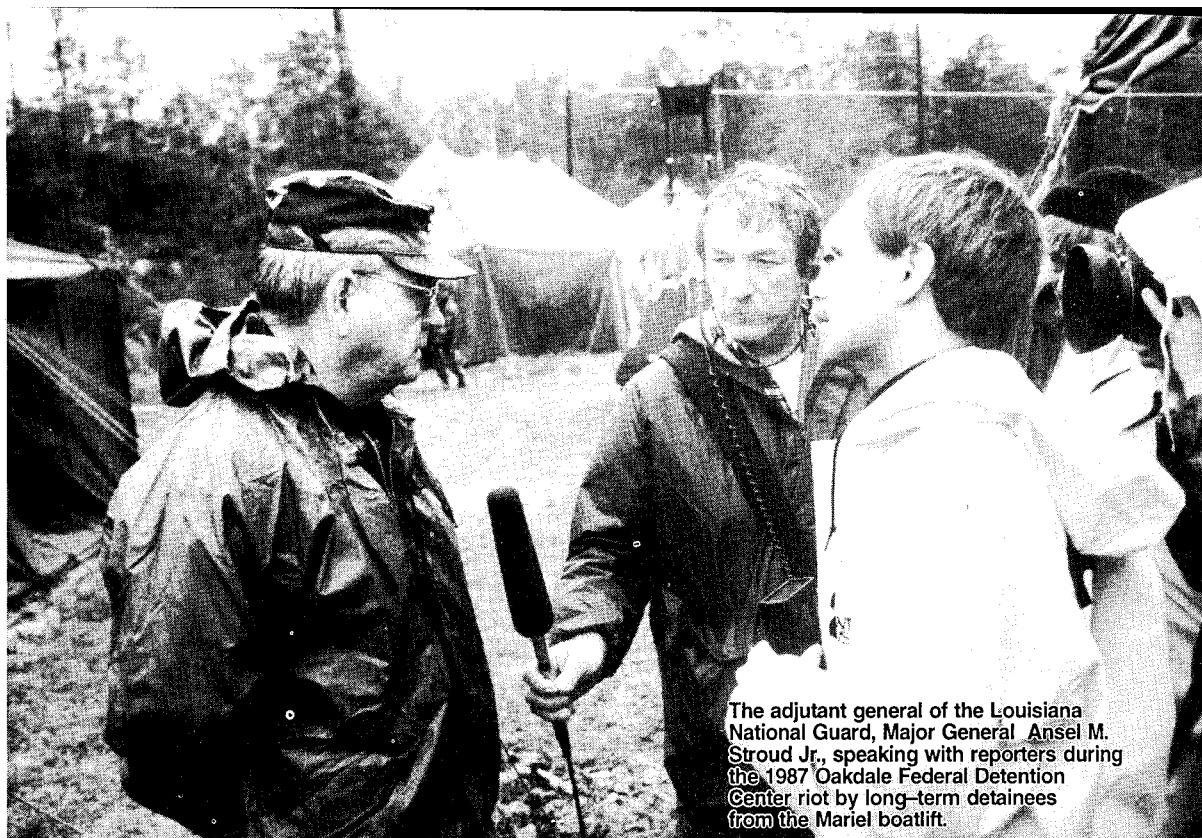
acknowledge shortfalls as well as successes and to discuss issues without obfuscating, attempting to withhold information or hide bad news. Media training efforts such as those initiated at the Combat Training Centers and Battle Command Training Program need to be routinely incorporated into all exercises.

Shaping tomorrow's PA force. The Army requires an educated, trained, agile, versatile PA force ready to provide unified, synchronized support in depth for combat operations and OOTW. To meet the new realities and requirements of force projection and the evolving media environment, PA doctrine, force structure and training must be evaluated. Weaknesses or voids in these domains must be identified and addressed.

PA principles and PA tactics, techniques and procedures (TTP) for performing battlefield PA functions and subfunctions applicable at all echelons and in all types of operations must be reviewed. The PA capstone document FM 46-1, *Public Affairs Operations*, must be revised, and a companion proponent document must be developed. Furthermore, PA must be more comprehensively addressed and more thoroughly integrated throughout Army doctrinal literature.

All PA personnel must be expected to do more than edit newspapers, produce broadcasts, write articles, take photographs or serve as station disc jockeys. They must be the equivalent of corporate communication managers in private industry, with all the knowledge, experience and media sophistication required for the 21st century media environment. Their main focus has to be developing multiechelon, fully integrated information strategies that support the Army and the command by accurately assessing needs and perceptions and facilitating the communication of timely, truthful, accurate information to enhance understanding, earn confidence and contribute to the accomplishment of mission goals and objectives.

The PA force structure must be reengineered for America's Army of the 21st century and the global media environment in which it will operate. It must be made up of potent staff elements embedded in division and corps headquarters and



The adjutant general of the Louisiana National Guard, Major General Ansel M. Stroud Jr., speaking with reporters during the 1987 Oakdale Federal Detention Center riot by long-term detainees from the Mariel boatlift.

All soldiers, from private to general, rifleman to chief of staff of the Army, as well as Army civilians, should have an appropriate level of PA skills and knowledge. . . . They should know their rights with respect to the media and have a basic understanding of how to act with media representatives.

separate organizations authorized the personnel and materiel required based on the capabilities assigned to them or the missions they are expected to accomplish. This may require adjusting the table of organization and equipment and table of distribution and allowance (TDA) mixture, because 65 percent of all uniformed PA professionals are assigned against TDA authorizations to develop a quick-reaction or rapid-response PA advisory team. Their mission is to provide immediate PA guidance and support in high-visibility, high-interest and emergency situations, and procure the necessary type-classified, deployable, maintenance-supported, cyclically upgraded modern equipment PA elements require. This includes dedicated, technologically advanced electronic news gathering and production equipment, satellite communications and secure mobile/cellular tactical communications.

PA training for America's Army. Every soldier, family member and Army civilian is in-

involved in activities and operations of potential interest to the media, perceived as a credible Army spokesperson and subject to being asked about issues, events or solutions. In fact, although official Army positions and statements are sought from and provided by senior leadership, the comments of soldiers, family members and Army civilians are often perceived to be more candid, honest, accurate, insightful and credible.

When audiences, both internal and external, want to know what our forces are doing and how they feel about it, whether their health and welfare needs are being provided for, or whether they have properly working equipment and supplies in sufficient quantity, they want the answers from soldiers, their family members and Army civilians.

All soldiers, from private to general, rifleman to chief of staff of the Army, as well as Army civilians, should have an appropriate level of PA skills and knowledge. They should understand

DOD *Principles of Information* and the *Principles for News Media Coverage*, which guide Army media relations. They should know their rights with respect to the media and have a basic understanding of how to act with media representatives.

Coordinate integration of related functions. Combat camera, psychological operations and civil affairs are mission areas that are related to

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PA. Our doctrine has recognized this and has acknowledged the need for coordination in these areas. As our operational environment changes, greater understanding and closer working relationships between PA and these other functional areas must be developed and institutionalized.

Furthermore, opportunities to eliminate overlapping responsibilities and efforts must be sought. Consolidated training, such as the visual information and PA NCO Academy merger, and combined materiel development efforts, such as those between the PA Proponent Activity, the US Army Signal Center and the Office of the Director of Information Systems for Command, Control, Communication and Computers, are significant first steps. Such efforts will result in a more unified approach to information communication planning, strategy development and execution. They will increase versatility and synchronization of effort and will lead to more

efficient, effective operations focused on clearly defined, decisive and attainable objectives and an integrated Army information communication effort.

Lead movement to joint and interagency PA. In the future, the Army will routinely operate in a joint and interagency environment. Therefore, the military services, non-DOD federal agencies and nongovernmental organizations need to work together to develop operating concepts and procedures and resolve manning and materiel issues. Procedures for the establishment of joint and combined information bureaus can become codified and exercised, rather than ad hoc and haphazard.

The Army is well positioned to provide the leadership necessary to bring about increased joint and interagency activity. It is already playing a significant role in the development of joint PA doctrine and a joint PA organization staffed and equipped to deploy as a joint information bureau. It could also provide the impetus for the development of an interagency PA effort that includes federal and nongovernmental agencies. Training opportunities and formal and informal operating agreements and procedures could be developed and coordinated to enhance interagency operations.

Promoting Change

The environment in which America's Army will operate in the 21st century will be markedly different from that in which we have been used to operating. A new world order has replaced the bipolarity of the past, and we must be prepared to face multiple, often unpredictable threats and challenges. America's Army must focus on readiness for war and be prepared to conduct a wide spectrum of OOTW. We must plan to operate as part of a joint, combined, coalition or interagency team, rapidly deploying from locations inside or outside of CONUS to anywhere in the world. We must expect to employ Active and Reserve Component elements and rely on support from Army civilians and civilian contractors.

These factors, along with the emerging in-

formation communication technologies and the growing importance of knowledge, signal the end of warfare in the industrial age and the start of warfare in the information age. "Many lessons have been and will be derived from *Desert Storm*. Some are not new; others are. One, however, is fundamental: the nature of warfare has changed dramatically. The combatant who wins the information campaign prevails. Information is the key to modern warfare—strategically, operationally, tactically and technically."⁶

We are, in fact, entering an age in which information will be a critical center-of-gravity for the Army. The evolving global media will be a critical element in tomorrow's information-oriented operational environment, and America's Army must recognize this. It must understand the effect that the media will have on the opinions, attitudes and beliefs held by the American public, our political leaders, our soldiers, their families and other important audiences. It must appreciate the impact of those opinions, attitudes and beliefs on our force and our missions. It must make PA considerations an integral element in planning information operations—indeed, in planning all operations.

To do this, Army PA, like the rest of the Army, must look forward with courage, objectivity and an open mind. America's Army and its PA community cannot simply examine the lessons learned in the past and apply them to the future. Instead, we must make informed choices based

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on an intellectual foundation developed in response to our understanding of the profound changes occurring in our environment. PA has developed its vision—to drive PA modernization efforts, to prepare PA to operate with efficiency and economy and to lead PA to readiness as a critical element of America's Army of the 21st century. **MR**

NOTES

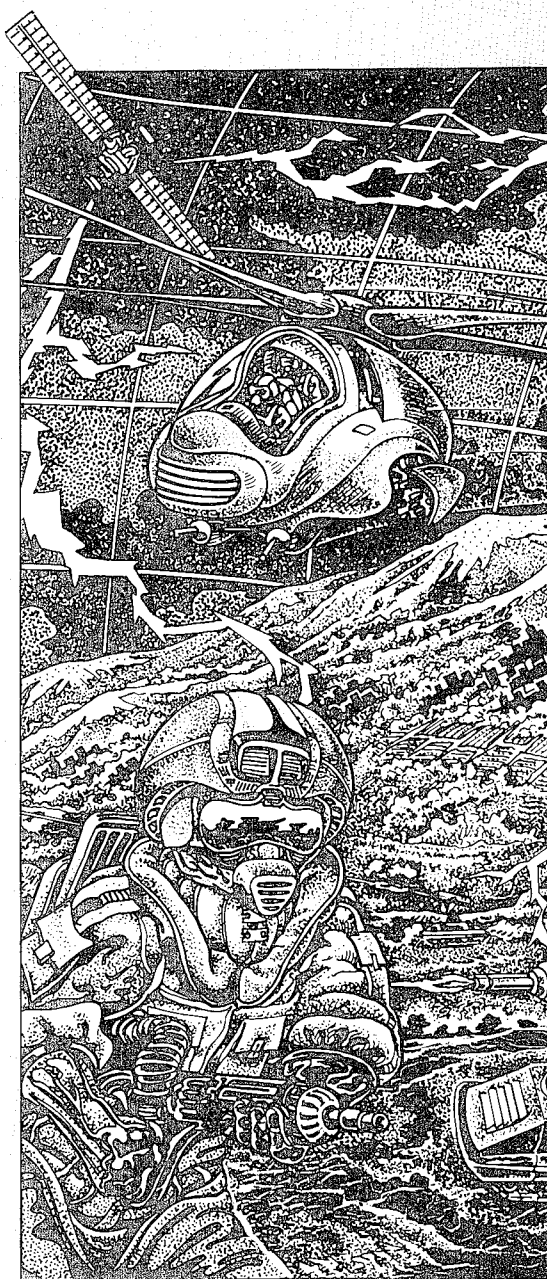
1. Alvin and Heidi Toffler, *War and Anti-War* (Boston: Little, Brown and Co., 1993), 165.
2. *Ibid.*, 174.
3. GEN Gordon R. Sullivan, "America's Army into the Twenty-First Century," *National Security Paper Number 14* (Cambridge, MA: The Institute for Foreign Policy Analysis, 1993).
4. Toffler, 147.
5. GEN C. E. Mundy Jr., "Commanders' Responsibilities to the Public Affairs Mission," *White Letter Number 13-92* (2 September 1992).
6. GEN Glenn Otis, Concept Paper: Information Campaigns (Ann Arbor, MI: Vector Research, Inc., 19 November 1991).

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Information Operations

America's Army must be prepared to face the full spectrum of operational environments as we enter the 21st century. Our focus for the future—Force XXI operations— must include organizations and leaders empowered to design and develop a rapidly expansible, strategically deployable and effectively employable force capable of achieving decisive results in war and operations other than war as a joint or multinational team. Doctrine will continue to provide a holistic basis for the Army to incorporate new ideas, technologies and organizational designs. It will also provide the philosophical impetus to help leaders become the adaptive, creative problem solvers required for future military operations. Advances in information management and distribution will facilitate the horizontal integration of battlefield functions and aid commanders in tailoring and employing land forces. New communications systems will allow nonhierarchical dissemination of intelligence, targeting and other operational data at all levels. The diversity of operating environments, equipment sophistication, increased tempo and substitution of situational knowledge for traditional physical control will place unprecedented demands on commanders and their staffs. If the Force XXI Army is to emerge fully prepared to meet the challenges of tomorrow, leaders must be skilled in the art of military operations, capable of adjusting rapidly to the temporal and spatial variations of future battlespace and able to master the many changes associated with the five battle dynamics—principal among them battle command. Together, we can make Force XXI the world's preeminent joint land fighting force and allow the United States to define the nature of information age warfare.



Force XXI Operations

Brigadier General Morris J. Boyd, US Army, and
Major Michael Woodgerd, US Army

The 21st-century force will be called Force XXI. Force XXI . . . will encompass the reconceptualization and redesign of the force at all echelons. . . . It is clear that we must open our minds to the power of change and ask ourselves "What could be?"¹

—Army Chief of Staff General Gordon R. Sullivan

IN MARCH 1994, General Sullivan announced the beginning of a new stage in the campaign to create Force XXI—the Army of the 21st century. In stating that “It is now time to redesign the force to better leverage the power of soldiers and technology,” Sullivan set out a broad charter to reengineer and reorganize the force to fully leverage the power of information in the hands of smart soldiers and leaders. Under the visionary leadership of General Frederick M. Franks Jr., former US Army Training and Doctrine Command (TRADOC) commander, this effort is well under way now. You can see glimpses of Force XXI in our Battle Labs, in Advanced Warfighting Experiments, in our training centers and in recent operations around the world.

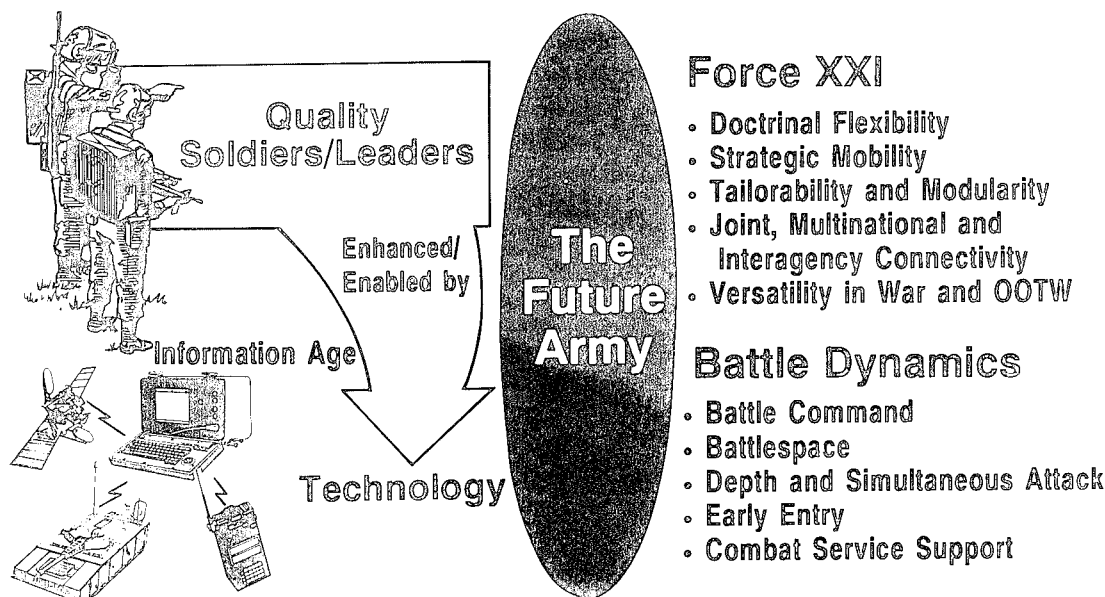
The plan will be executed along three axes: joint venture; acquisition, assimilation and programming; table of distribution and allowances and institutional Army. Close integration of these three axes will be required in this move forward into an environment filled with uncertainty and ambiguity. We must conceptualize, hypothesize, experiment and make decisions about all aspects of the force in a time-sensitive, iterative cycle that will lead to the necessary doctrinal, organizational and materiel decisions.

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The synchronization required in this effort is the charter of the Louisiana Maneuvers Task Force (LAM). The main effort in the march toward the future and in the Force XXI campaign plan falls to TRADOC's Joint Venture.

Responding to the Army chief, the TRADOC team took the lead on the joint venture axis in partnership with the Army staff, Army Materiel Command, Army Special Operations Command, Forces Command, Health Services Command, Information Systems Command, Intelligence Security Command, Operational Test and Evaluation Command and Space and Strategic Defense Command.

The Joint Venture Campaign has these major tasks: attain Force XXI fielding decisions by fiscal year (FY) 2000; design and validate Force XXI operating force elements by continuing the Advanced Warfighting Experiments schedule with an experimental force in FY 95; and inform



the Army of implications of digitized full-dimensional operations. Simply put, Force XXI will be a fully internetted, vertically and horizontally integrated foxhole-to-factory design effort.

Intellectual Underpinnings

The intellectual underpinning for work on all three axes is TRADOC Pamphlet (Pam) 525-5, *Force XXI Operations*, published on 1 August 1994. As the Army published the 1993 version of US Army Field Manual (FM) 100-5, *Operations*, last summer, Franks directed that we stretch our intellectual thinking into the future. This visionary guidance to TRADOC's Future Battle director, Colonel Gary Griffin, prompted wide-ranging research and a concentrated writing effort. With input from the Battle Labs, TRADOC commandants, academia and selected retired general officers, Griffin quickly produced the initial draft TRADOC Pam 525-5. After several months of review and staffing, TRADOC published the document with these remarks from Franks.

"This vision of future operations, both in its evolving format and content, reflects the dynamic nature of current world events and the discovery method of change for the Army. Thus, this concept is intended to provide focus for experimentation, stimulate further thought and generate discussion on Future War and Operations Other Than War."

Force XXI Operations provides the conceptual foundation for achieving Sullivan's vision of Force XXI. "We know we will make a quantum leap; 525-5 helps us see how . . . this is a work that tells us about how the entire Army must change—from the foxhole to the factory—top to bottom."

TRADOC Pam 525-5 explains how flexible, agile, rapidly tailored units will be increasingly possible because of our ability to share and move timely information among quality soldiers, leaders and units. Exploiting information age technologies to achieve continuing coherence through shared knowledge, and the resultant improvements to battle and campaign results in war and operations other than war (OOTW), is at the heart of the concept. The pamphlet describes full-dimensional operations for Force XXI—a strategic Army that will continue to provide staying power on land to achieve our nation's future national security needs. It explains, in general terms, how the Army will function in the future as the land component executing joint, multinational and interagency operations in war and OOTW. It outlines how the performance of future soldiers and leaders will be enhanced by information age technology and integrated battle dynamics. Reflecting advances in weapons, information technology and leader development, the concept describes how force coherence—the concentration of joint and combined arms *effects*,



Missouri National Guardsmen installing telephone wires to front-line trenches by way of a culvert, Montigny, France, 12 March 1918.

Throughout history, advances in technology continually compress more war into less time and space. This compression strains the limits of human endurance. That is why "Force XXI battle command must invigorate the synthesis of information for the commander—not support more analysis for the staff to overload the commander with."

vice concentration of *forces*—can be achieved. With a shared common, relevant picture of a given battlespace, commanders will use a relatively unconstrained framework—a digital framework—to organize the battlefield and control operating tempo.²

This will ultimately produce a Total Force capable of conducting land warfare in tough, uncompromising situations and environments with courageous soldiers and competent leaders. Force XXI will have five characteristics: doctrinal flexibility; strategic mobility; tailorability and modularity; joint, multinational and interagency connectivity; and versatility. These organizational characteristics will be maximized by soldiers and leaders whose capabilities will be enhanced by information technology. When this overall potential is realized, the Total Force will be more lethal, survivable and better able to control operational tempo than ever before.

Product and Process

Recognizing the need for a more dynamic process, we took a fresh, even revolutionary, look at how to produce doctrine. The rapid rate of change in today's world is indicative of our current dynamic process for today's Army and certainly for the 21st-century Army. During this period, the *process* of change is as important as the *product* that change produces. We assimilate the wisdom of the Army's collective warfighting experience into doctrine; assess the need for change and, ultimately, put sound theory into practice. TRADOC Pam 525-5, our intellectual centerpiece, represents today's concept of the future. It must be relevant to, and consistent with, the external strategic and technical environment as well as current operations. In the past, doctrine development was sequential, but it is now dynamic. We have changed the way we change.

[*Force XXI Operations*] explains how flexible, agile, rapidly tailored units will be increasingly possible because of our ability to share and move timely information among quality soldiers, leaders and units. Exploiting information age technologies to achieve continuing coherence through shared knowledge, and the resultant improvements to battle and campaign results in war and OOTW, is at the heart of the concept.

How we think about the future shapes what we think and ultimately what we do. This logic shaped the structure of TRADOC Pam 525-5 into four chapters:

Chapter 1—Leading Change: The Challenge of the Future

Chapter 2—The Future Strategic Environment

Chapter 3—Future Land Operations

Chapter 4—Implications

The document describes future influences and threats and the nature of future land operations that will result. This perception of future operations leads to a discussion of the implications for change in each area of doctrine, training, leader development, organizations, materiel and soldiers (DTLOMS). The remainder of this article will focus on the battle dynamics, areas where battle appears to be changing most significantly, to describe future land operations. It will then highlight some of the resultant DTLOMS implications.

Battle Dynamics: Meeting the Challenge

As previously described, recent operations give us a glimpse of the nature of future warfare. We see battle changing in five major areas that Franks termed battle dynamics: battle command, battlespace, depth and simultaneous attack, early entry and combat service support (CSS). These

battle dynamics give us a framework to describe change. Two key elements permeate all battle dynamics. First, the application of combat power will be greatly enhanced by the improved coherence of deployed forces and more effective application of force by those elements. This phenomenon will be achieved by shared knowledge of battlefield conditions versus traditional physical control means such as voice communications, graphic control measures or geographical demarcation of areas of operation. Second, our quality soldiers and their noncommissioned and officer leaders are well trained and professionally developed through military education and tough, realistic training. A description of battle dynamics—operational manifestations of the Force XXI characteristics—follows.

The art of battle command. Representing the art of battle decision making, leading and motivating soldiers and their organizations into action to accomplish missions, battle command is more than simply command and control (C²). Future information technology will provide the means to collect, process, disseminate and display information in an unprecedented manner. We must take a fresh look at the old C² concept, because improving technology in the hands of our soldiers and leaders will change the way commanders see the battle and control it. Units cover more ground and operate at greater sustained speeds and, during pulses of operations, increase speed even more. This has increased the relative power of junior leaders as well as the consequences of each act they take. Throughout history, advances in technology continually compress more war into less time and space. This compression strains the limits of human endurance. That is why "Force XXI battle command must invigorate the synthesis of information for the commander—not support more analysis for the staff to overload the commander with."³

The ability to move information rapidly and to process it will likely change the way we command military operations. It will greatly influence force organization, command procedures and staff systems. It must capitalize on the power of our quality soldiers, enabled by what



A JSTARS ground station module on the move during a training exercise.

Force XXI's battle command system will employ broadcast battlefield information, as well as information from other sources, and integrate that information, including real-time friendly and enemy situations, into a digitized image that can be displayed graphically in increasingly mobile and heads-up displays.

we now call information age technology. It must recognize the inevitable coexistence of both hierarchical and nonhierarchical (internettted) information processes.

Force XXI's battle command system will employ broadcast battlefield information, as well as information from other sources, and integrate that information, including real-time friendly and enemy situations, into a digitized image that can be displayed graphically in increasingly mobile and heads-up displays. These images will, in essence, depict a unit's actual battlespace. Collective unit images will form a battlefield framework based on shared, real-time awareness of the arrangement of forces in the battlespace rather than a rigid framework of battlefield geometry—phase lines, objectives and battle positions. This system permits commanders at every level to share a common, relevant picture of the battlefield scaled to their level of interest and tailored to their special needs. Simultaneously, command-

ers at the same echelon will have a shared perspective of their position in relation to adjacent units and a clear understanding of the commander's intent. Combat, combat support (CS) and CSS leaders, horizontally linked by common information, will, for the first time, have a means to visualize how they will execute an operation in harmony, integrated by a shared vision of the battlespace. Individual soldiers will be empowered for independent action because of enhanced situational awareness, digital communications and a common view of what needs to be done.

Internettted information will greatly enhance all operating systems, with the greatest potential payoff in intelligence and operations functions. Rapid distribution of information, such as broadcast intelligence to all unit levels, is critical. Through shared situational awareness, combatants can coordinate some actions better than a higher headquarters can by directive command. Higher echelons will monitor lower networks,

Spectrum supremacy recognizes that, while control of the entire electromagnetic spectrum is impossible, the key portions that Force XXI systems will rely upon must be commanded most of the time.

allow subordinates to fight the close fight and concentrate on influencing the remainder of battlespace in depth, height, width and time.

This future command system is obviously predicated upon our exercising *spectrum supremacy*—control over the required portions of the electromagnetic spectrum to enable the conduct of Force XXI operations. Spectrum supremacy recognizes that, while control of the entire electromagnetic spectrum is impossible, the key portions that Force XXI systems will rely upon must be commanded most of the time. Our use of information as the operational focus will be a strength but could also easily become an Achilles' heel. Protection of friendly information systems from myriad threats while exploiting and/or denying the enemy use of his systems will be absolutely critical. In the future, information operations at strategic, operational and tactical levels must be fully integrated into the planning, preparation and rehearsal for every operation. Commanders must be personally involved in determining the vital role all aspects of information operations can play in the successful execution of military operations in war and OOTW.

Battlespace. A joint concept, battlespace is closely associated with the components of battle command. Battlespace is a concept that facilitates the type of innovative approach to warfighting required of leaders in future battles. Battlespace involves the ability to visualize the area of operation and the way forces interact, whether in combat or in humanitarian relief missions. The size, shape and density of a unit's battlespace is variable and influenced by mission, enemy, troops, terrain and weather and time

available (METT-T). It may also be shaped by political constraints or other situationally unique factors. In the physical sense, battlespace is that volume determined by the maximum capabilities of a unit to acquire and engage the enemy—capabilities which will be greatly expanded by future technology. Since battlespace is not defined by time, boundaries, graphics, countermeasures or other physical constraints, it offers commanders a means to look at conditions beyond their traditionally defined area of operation that may affect or influence events within that area. In terms of visualizing an area of operation and how forces or other elements interact, battlespace has equal utility in OOTW.

Our forces must be able to dominate an expanded battlespace. Such domination will be measured by the ability to be more lethal and survivable and operate at a tempo greater than the enemy. In many cases, we will dominate this battlespace in war using more systems than soldiers. Since OOTW will usually focus on population control, we may dominate this battlespace with more soldiers than systems.

Technical improvements in maneuver weapon systems, such as advanced optics, increased ranges and digital electronics, will have a dramatic impact on tactical battlespace. The spatial expansion of the future joint battlefield will result in service-specific functional battlespaces intersecting and overlapping. This conceptual battlespace construct will give joint commanders a coherent vision of a fully integrated, full-dimensional battlefield and permit simultaneous engagement of targets by a greater variety of joint warfighting systems.

Information operations influence battlespace by providing the commander the means required to better visualize the battlespace while blinding or shaping an opposing commander's vision. Battlespace then becomes a function of the commander's ability to use information provided by the command system previously described and employ warfighting systems to achieve the necessary balance to ensure success.

Depth and simultaneous attack. The domination of extended battlespace will require agile

A control and reporting center linking US and coalition ground-mobile and airborne communications during the Gulf War, King Khalid Military City area, Saudi Arabia.



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and robust depth and simultaneous attack capabilities throughout the battlespace. As stated earlier, advances in this dynamic may dictate a reassessment of the traditional relationship between fire and maneuver. Combining the concepts of deep operations and simultaneous attack, using both lethal and nonlethal means, creates a dynamic mode to extend the battlefield in space, time and purpose; to reduce, if not entirely eliminate, the time and need to shape the battlefield; to facilitate full-dimensional attack of an enemy center-of-gravity; and to accelerate his defeat. Simply stated, depth and simultaneous attack will enable the commander to directly influence the enemy throughout the width, height and depth of his battlespace to stun, then rapidly defeat that enemy. Force XXI commanders can quickly and decisively defeat an enemy force by combining long- and short-range area and precision fires; information operations designed to blind, demoralize and

deafen the enemy; and rapid combined arms maneuver. Although these attacks may not be simultaneous in application, from the enemy's perspective they will appear seamless and nearly simultaneous in effect.

A key component of depth and simultaneous attack will be measures taken to win the information war, including the establishment of electromagnetic spectrum supremacy through nonnuclear electromagnetic pulse generators, space-based information denial systems and computer viruses. Counter-C² operations will normally precede, but may take place concurrently with, ground and air operations. Command and control warfare (C²W) may replace air supremacy as the essential first step in operations. Television and other communications media provide means to bolster or undermine the will of entire populations. Another method of attack will be through access to enemy battlefield computer systems and information manipulation.

Force XXI will continue to be a doctrinally based institution. Doctrine will remain the primary means of expressing the Army's philosophy on land operations. . . . [and] will continue to provide a holistic basis for the Army to incorporate new ideas, technologies and organizational designs.

Through our successful friendly information operations, adversaries will be forced to exercise command through 19th-century means, while US forces operate state-of-the-art, 21st-century systems.

Early entry. This is one of the battle dynamics where change is most dramatic—where the relevance of the force-projection Army to the current and near future strategic environment is most notable. Army early-entry forces will conduct a wide range of operations, many of which will be joint, multinational and interagency. Innovative combinations of combat forces and sustainment capability will be required to meet the challenges associated with early-entry operations. Early-entry operations will be conducted by forces that are not necessarily light or heavy, but tailored to METT-T to create the best possible capabilities-based force to meet the needs of any given contingency. When possible, the aim of early-entry forces must be simultaneous application of force or control throughout the operational area. If forced initially into other circumstances, the aim should continue to be rapid and simultaneous application of force or control as quickly as possible.

Prior to deployment, the commander will train and rehearse through interactive simulation and live modes. Simulation will permit units at different locations to fight together through a combination of virtual, constructive and live simulations in a mission planning and rehearsal system. Various mission planning software already exists that allows planners to look at terrain from various heights and directions and

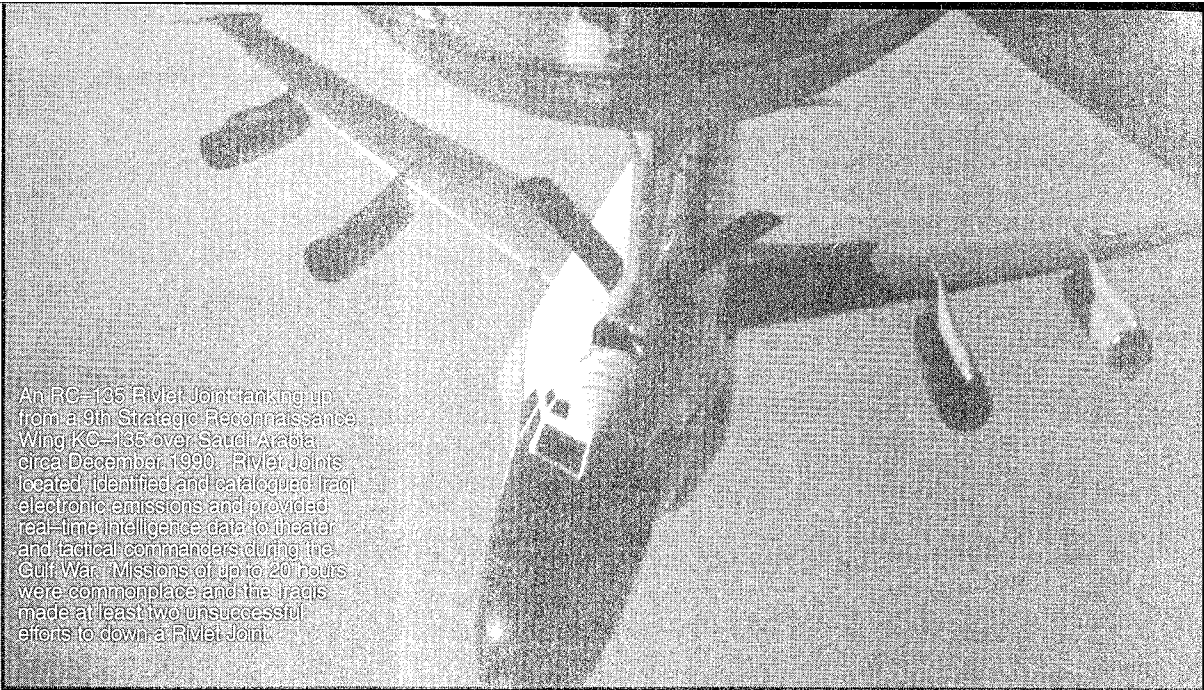
plan accordingly. Essential to this capability is the requirement to have comprehensive and updated data bases showing terrain and man-made structures in all potential areas of operation. Based on multispectral imagery, accurate weather reports and current intelligence information, soldiers will be able to use simulations to rehearse operations repeatedly before they are actually called upon to perform them. Information technology will provide deploying units access to the latest intelligence and information in the theater of operations to continue active involvement in planning. En route simulations capabilities will enable the force to continue training and rehearsals while deploying.

Combat service support. Rapid force projection from platforms in the Continental United States or forward-presence bases, extended lines of communication and potential forcible entry into logistically bare-base areas of operation require continual evolution from present doctrine. The varied demands of war and OOTW require the development of a logistic system that is versatile, deployable and expandable. Modular units in both the Active and Reserve components will allow rapid force logistic tailoring. This future logistic system must be as capable as the joint and multinational forces, to include the special operations forces (SOF) that it will support, because effective sustainment operations—primarily an Army responsibility—establishes the conditions for operational success. Creation of this new CSS system necessitates weaving the current strategic, operational and tactical levels of logistics into a seamless continuum.

Force XXI Operations

The general and seamless pattern of future joint land warfare will be: *mission analysis and force tailoring, reconnaissance and preparation, decisive action, and sustained operations or recovery.* Although listed separately and sequentially, these actions will most often occur simultaneously and, at the operational level, appear seamless.

- o Mission analysis and tailoring of forces for force projection, to include lift and pre-positioned equipment considerations.



An RC-135 Rivet Joint tanking up from a 9th Strategic Reconnaissance Wing KC-135 over Saudi Arabia, circa December 1990. Rivet Joins located, identified and catalogued Iraqi electronic emissions and provided real-time intelligence data to theater and tactical commanders during the Gulf War. Missions of up to 20 hours were commonplace and the Iraqis made at least two unsuccessful efforts to down a Rivet Joint.

A key component of depth and simultaneous attack will be measures taken to win the information war, including the establishment of electromagnetic spectrum supremacy through nonnuclear electromagnetic pulse generators, space-based information denial systems and computer viruses. . . . Command and control warfare may replace air supremacy as the essential first step in operations.

- Reconnaissance and preparation of operational area, to include enemy or other forces in the area of responsibility, surprise and deception.
- Decisive action by simultaneous attack or control throughout the area of responsibility by use of fires and air, naval and land forces.
- Sustained operations to achieve strategic aims or recover to move to another theater.

This manner of conducting joint land operations does not rely solely upon future technologies. Force XXI operations are possible with existing technologies; we are simply not organized to take advantage of them yet. Our weapons can strike anywhere in our battlespace, but we cannot fully control them or sense their effects. Intelligence systems can provide detailed images, and SOF can supply critical human intelligence. However, the full synchronization of all this capability is not realized. Evolving information technologies will almost certainly unlock the full potential of Force XXI operations, but we must begin now to change the way we think and organize staffs, information flow, procedures and possibly organizations. Existing and evolving information technologies will support and shape

the evolution of procedures and processes. This ongoing doctrinal development will place the Army in the lead of the revolution in military affairs.

Future US land combat operations, Force XXI operations, will be deliberately designed to control—maintain, accelerate or moderate as necessary—the pace of battlefield events. The intent is that these dynamic combat operations take place over the shortest feasible time at the least cost to friendly forces, enemy forces and neutrals. In the hands of a new generation of leaders adept in the art of command, these fast-moving operations will occur throughout the operational width, depth, height and time of a given battlespace, using a wide variety of means—surface, space, sea, air, electronic, informational, psychological and special operations. The spatially extended pulse of lethal and nonlethal striking power—a glimpse of which was offered in Operations *Just Cause* and *Desert Storm*—will overwhelm enemy commanders' capacity to react. When viewed from the receiving end, once unleashed, 21st-century US military operations will appear as one seamless, fully

The capability to interconnect virtual, live and constructive simulations for unit training across the full range of military operations will be necessary and must be embedded in our equipment. Distributed interactive simulations will tie geographically dispersed units together for training and actual mission rehearsal.

synchronized and multifaceted strike, involving all elements of US and coalition military power.

From Concept to Reality

The implications of moving from concept to reality to describe how the Force XXI Army will operate on future battlefields are tremendous, especially given the unpredictable, rapidly changing world environment. The most viable framework in which to address the implications of this future concept is in terms of their impact on TRADOC domains: doctrine, training, leader development, organizations, materiel and soldiers.

Doctrine. Force XXI will continue to be a doctrinally based institution. Doctrine will remain the primary means of expressing the Army's philosophy on land operations. A hallmark of US military doctrine is its adaptability. Consequently, future doctrine will be increasingly influenced by a number of factors such as developments in human sciences and information technologies. Information age technology will profoundly impact both the doctrinal process and doctrine itself. For example, the doctrinal implications arising from the command system described in this concept are so great that it will take years for them to be fully understood, let alone developed.

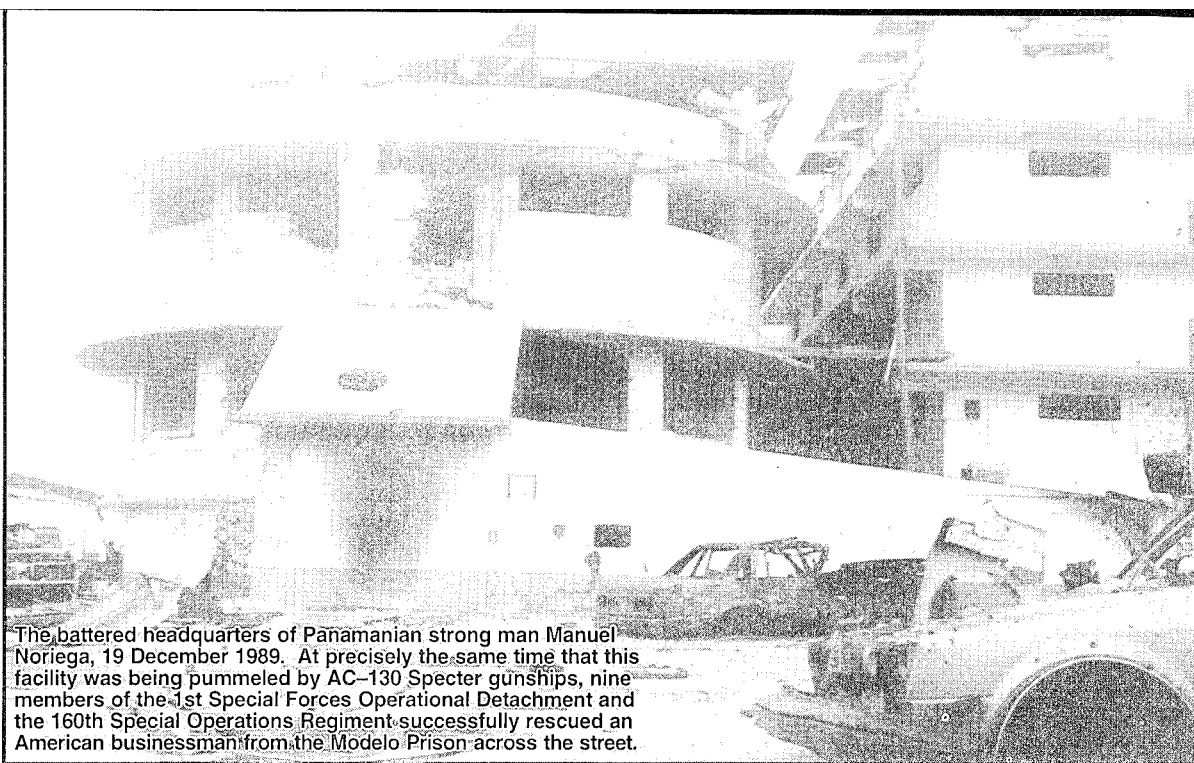
Doctrine will continue to provide a holistic basis for the Army to incorporate new ideas, technologies and organizational designs. It will also provide the philosophical underpinnings for initiatives designed to help leaders become the adaptive, creative problem solvers required

for future military operations.

Simulations and experiments will serve as test-beds for emerging doctrine, helping Force XXI conduct the critical, doctrinally focused, front-end analyses required for new materiel and force design initiatives. As Force XXI refines new ideas and concepts, their doctrinal relevance will be quickly captured in manuals and—ultimately, through CD ROM (compact disk read-only memory) technology—communicated throughout the Army. Key to this timeliness will be electronic staffing, whereby Army learning and combat training centers, major commands, doctrine developers, operational planners and subject-matter experts will form an internetted system for the development of relevant doctrine.

Training. Training in support of future full-dimensional operations will cause Force XXI to realign the three pillars (institutional, unit and self-development) of the Army training system. The integration of these three training strategies more fully will yield a seamless future training strategy for every soldier and unit. The future training strategy will continue to be task-based and trained to a standard under varying conditions. All training executed in the institution, in the unit or by the individual soldier will directly contribute to improved soldier, leader and unit mission readiness.

Major changes will occur in how Force XXI trains. This will lead to the merging of the individual, unit and self-development parts into the seamless Army training system. For a variety of reasons, the number of installations on which traditional institutional training takes place will decrease as will the number of installations on which major (battalion-level and above) field exercises will occur. However, these installations will be internetted and interconnected to facilitate both individual and collective training at all levels. Individual skill training refreshers and sustainment will be available to each soldier. Data bases will be available to the soldier to address lessons learned from previous operations, worldwide political and demographic information or expert individual specialty training requirements. It will be the proverbial *classroom without walls*. The capability to intercon-



The battered headquarters of Panamanian strong man Manuel Noriega, 19 December 1989. At precisely the same time that this facility was being pummeled by AC-130 Specter gunships, nine members of the 1st Special Forces Operational Detachment and the 160th Special Operations Regiment successfully rescued an American businessman from the Modelo Prison across the street.

Force XXI operations, will be deliberately designed to control—maintain, accelerate or moderate as necessary—the pace of battlefield events. The intent is that these dynamic combat operations take place over the shortest feasible time at the least cost to friendly forces, enemy forces and neutrals.

nect virtual, live and constructive simulations for unit training across the full range of military operations will be necessary and must be embedded in our equipment. Distributed interactive simulations will tie geographically dispersed units together for training and actual mission rehearsal. This capability will be required to be joint and often combined. However, the essence of land combat is to take and hold terrain—the essence of our combat training centers is “doing it in the dirt” to experience a realistic tough battle scenario that requires synchronized execution at all levels. This must continue.

Leader development. Future Army leaders must be able to fully exploit the opportunities that command systems such as the one described herein provide. They cannot use these systems to second-guess or interfere with the command prerogatives of subordinate commanders. They must have such intuitive skills as vision, innovation, adaptability and creativity and the ability to simplify complexities and clarify ambiguities—all while operating under stress.

Leaders will be schooled in joint and multi-

national operations and skilled in synchronizing and harmonizing all aspects of combat and non-combat operations. Future leaders will have a higher level of doctrine-based skills, knowledge, attitudes and experience to apply the battlefield operating systems to a wider range of complex contingency missions. In fact, the complex nature of future operations may require leaders of greater experience and rank commanding at lower levels than ever before. Regardless of experience or rank, all future leaders will be called upon to make rapid, doctrinally sound decisions as they plan and execute missions in more diverse, high-pressure operational environments. Tactical-level leaders must be prepared to make decisions involving rules of engagement and actions that may have major strategic consequence, under the scrutiny of the international media.

Organizations. The future Army will be smaller, but with new, expanded and diverse missions and increased capabilities due to technological advances to meet the challenges of an unpredictable, rapidly changing world. These factors

mandate organizational change. It is essential that the capability to design organizations be flexible. Restructuring the organizational design process focusing on the Army's unique mission capabilities will bring units to the future battlefield capable of conducting multiple missions. These units will complement the warfighting capabilities that other services, multinational partners and agencies bring to the operation.

Future organizational design will capitalize on the full range of mission capabilities available in the Total Force structure, leading to the success that is essential for knowledge-based operations.

Materiel. Our force-projection Army must be versatile, lethal, deployable, sustainable and capable of winning the nation's wars. It must be responsive to meet the challenges of full-dimensional operations. The materiel requirements to support this emerging warfighting concept are both revolutionary and evolutionary. The future materiel capabilities described herein will be driven by leveraging technologies that are horizontally integrated into weapon systems and platforms. The ongoing work in TRADOC battle labs will support the LAM process in ensuring experimentation influences concepts such as TRADOC Pam 525-5.

Soldiers. Quality soldiers, trained and led by competent and caring leaders, will remain key to success on future battlefields. Soldiers in the 21st century will be faced with a wide variety of challenges in preparing for and executing missions in full-dimensional operations. Soldiers will be trained on selected critical individual tasks in initial entry training to ensure they are immediately deployable upon joining their first unit. They will be familiar with the wide variety of tasks expected of them and the equipment

they will use. This concept seeks to empower and develop the untapped potential of our quality soldiers. The battlefield contribution of individual soldiers will continue to increase and will be the root of knowledge-based operations.

Increased flexibility and adaptability will be required at all levels. As a result, recruitment and selection will focus on early identification of those who will be able to contribute immediately. Force XXI will also increase the demand for soldiers who speak a second language. Training for promotion will be mandatory and will focus on preparing junior leaders for vastly increased responsibility at a much lower rank and earlier in their careers than is the case today.

Mastery of the many changes associated with the five battle dynamics and full exploitation of DTLOMS implications will produce Force XXI, a 21st-century force prepared to meet the challenges of the future. Franks, the principal architect and team leader of *Force XXI Operations* emphasizes that "This force will still hold true to its ethos—fighting and winning our nation's wars. Land warfare will remain tough, uncompromising and final. It requires soldiers and leaders who are versatile, agile and committed."

Development of Force XXI will require that we continue to adapt and change the way we change. The Army will be a learning, adaptive organization rooted in its great past with strength, desire, vision and the plan to make us what the nation needs us to be. *MR*

NOTES

1. *Building the Force for the 21st Century—Force XXI*, Chief of Staff of the Army message dated 8 March 1994.

2. The term "battlespace" has evolved from two words in FM 100-5 to one word. This more accurately conveys GEN Franks' intent of battlespace as an intellectual construct and aligns terminology within the joint community.

3. COL Gregory Fontenot, director, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS.

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Battle Command: A Force XXI Imperative

Major James C. Madigan, US Army, and
Major George E. Dodge, US Army

Our military service is based on values—those standards that American military experience has proved to be the bedrock of combat success. . . . First and always is integrity. . . . Competence is at the center of our relationship with the American people and cements the mutual cohesion between leader and follower. Our fellow citizens expect that we are competent in every aspect of warfare; those we lead into battle deserve no less. . . . Since warfare began, physical courage has defined warriors. . . . Moral courage is also essential in military operations.

— Joint Publication (Pub) 1,
Joint Warfare of the US Armed Forces

IN CONTRAST to the values outlined in Joint Pub 1, Lieutenant General Bernard Trainor, US Marine Corps, Retired, paints a grim picture of the Army's leader development and command selection:

"The U.S. Army tries to predict greatness. Every crop of newly commissioned officers is carefully watched during their fledgling years. Those who show promise are given assignments of greater responsibility. In time, those with the greatest potential enter the fast track of prestigious but demanding assignments. Institutional Army then stands back and watches the 'golden boys' compete with one another on the racetrack to success. Along the way, the competitors usually acquire unofficial sponsors to help them—normally senior generals whom the officers have served well. An officer's 'rabbi' can hustle a bright career along quite well.

"The route to success is clearly marked through command and staff assignments at

every level, war college, and assignments outside the Army fold—to see if outsiders think an officer is as good as the Army thinks. It is a cutthroat competition for accomplishment, reputation and visibility. During their careers, some of the contenders fall by the wayside, victims of mistakes or just bad luck. Most make colonel. A few of each graduating class make star rank; fewer still make it to four-star general; and an infinitesimal number get to the top jobs in the Army or to command a unified command."

The general's description casts special doubts on the selection, development and fitness of those given the grave responsibility of commanding soldiers in battle. Emphasis on early prediction, politics, cutthroat competition and selfish rather than selfless service runs counter to the ideal meritocracy where the commander is selected and promoted based on achievement, competence and demonstrated potential. Battle command, a combat function introduced in US Army Field Manual (FM) 100-5, *Operations*, may help us understand what the competencies, achievements and potentials should be for the commander entrusted with the most important of all assignments: command of soldiers in battle.

The commander is not grown overnight nor does rank necessarily correlate with fitness to command. Understanding and putting battle command skills to practical use is a long road, but it does follow the professional officer career development path. The officer must strive at each level of his career to achieve the highest level of proficiency he is capable of achieving. One way to measure achievement is through job

To accomplish the ultimate goal of command at battalion and higher, the future commander must learn skills, develop competencies and ingrain his craft into everything he does. There are no breaks. Self-development and study are key. . . . Should he not spend at least as much time training and developing [his mind] as he does his body?

performance and evaluation of the type job that provides specific feedback directed at skill improvement and not the person. To accomplish the ultimate goal of command at battalion and higher, the future commander must learn skills, develop competencies and ingrain his craft into everything he does. There are no breaks. Self-development and study are key. Granted, this requires spending personal energy and resources. One of the most powerful assets the commander brings to the fight is his mind. Should he not spend at least as much time training and developing it as he does his body?

The purpose of this article is to explore the concept of battle command with the aim of stimulating further thought and discussion. The study of the art of command is as ancient as warfare itself; however, battle command, as a new concept in our doctrine, is not well developed. The challenge is to synthesize what is known and can be learned about the art of command in battle to drive changes in doctrine, training, leader development, organizations and technology as the Force XXI Army enters the information age.

What is Battle Command?

FM 100-5 describes battle command as "The art of battle decisionmaking, leading and motivating soldiers and their organizations into action to accomplish the mission at the least cost to soldiers." Author Thomas P. Coakley in *Command and Control for War and Peace*, stresses the importance of command and control (C²), but

highlights the different orientations various groups of people bring to the table. "Because C² has come to mean many different things to many intelligent, well-meaning people, discussions of this important topic can be very confusing and even aggravating. An engineer or contractor . . . thinks of C² in terms of technology . . . behavioral scientists who see C² as a matter of information processing may be dismayed when debates concern budget issues. . . . Military people and members of Congress . . . are likely to fix their attention on still other aspects of C², such as strategies or vulnerabilities. Yet C² comprises all of these things, as well as others."

Two Vital Components: Leading and Deciding

FM 100-5 introduced battle command as a fundamental tenet of Army operations. Categorized as a combat function, it does not package old notions about the C² battlefield operating system (BOS) under a new label, but distinguishes the essence of command from its implementing systems. Focus is clearly on what the commander must be able to do throughout the full cycle of force-projection operations and not on the system composed of people, technology, organization, procedure and subsystems that exist to support the commander during the fight. The shift in emphasis is from the older C² concept with its command post fixations, large tactical staffs, process-oriented control and high-budget procurement programs to an information age orientation where the commander visualizes his battlespace and is supported by lean, agile battle command support teams equipped with digitized technology. A *system* is a collection of things working together to produce something greater.¹ The something greater produced by C² BOS is battle command—at its heart is the commander.

The shift in focus from systems and things to the commander and his effectiveness is evolutionary, not revolutionary. It is required to adjust to the significant global changes we are all familiar with. The effect of these changes is the formation of a very complex construct within

UH-60 Black Hawks practice takeoffs from the deck of the USS *Eisenhower* as the aircraft carrier transports elements of the 10th Mountain Division to Haiti, 17 September 1994.



Throughout the depth and altitude of the battlespace (Continental United States to forward-deployed units), the commander must simultaneously execute, mount and recover from operations ranging from war to humanitarian assistance in environments that are increasingly hostile, uncertain, confusing and ambiguous. He must synchronize all of his operating systems.

which command takes place. Throughout the depth and altitude of the battlespace (Continental United States to forward-deployed units), the commander must simultaneously execute, mount and recover from operations ranging from war to humanitarian assistance in environments that are increasingly hostile, uncertain, confusing and ambiguous. He must synchronize all of his operating systems. He must do this all very quickly while under instant public scrutiny.

Key to understanding this new battle focus and the demands these changes place on the commander is to understand the role of knowledge and the value of information. The quantum competitive advantage into the next century will derive from the quantity, quality and usability of information. This includes not only timely, accurate and relevant information delivered to the commander during force-projection opera-

tions, but also the routine flow of information delivered to the commander and aspiring commander to systematically increase their stock of knowledge on a regular basis.

Despite the changes, war remains primarily a human endeavor and commands an intensely personal experience. The human dimension—character, will, discipline, motivation and fear—must be reckoned with. Soldier skills, courage, self-sacrifice, leadership and values-based cohesion remain essential virtues as they give the Army its ultimate value. The commander's job has always been to make order of chaos; he must now do it quicker, while on the move, with practiced insight and while under the instant scrutiny of the nation.

Continuous, incremental improvements in the commander's leadership and decision-making abilities may prove to be the most cost-effective

Soldiers train up for a 40th Infantry Division **WARFIGHTER** exercise.



Thorough knowledge of Army doctrine across each BOS and the combat function processes, such as intelligence preparation of the battlefield and wargaming, a strong ethical sense and understanding of enemy and friendly capabilities, form the basis of battle judgment.

way to increase our control of battle tempo, the environment and battlespace. These improvements will result from an increased understanding of what the commander needs to be, know and do. This understanding is required to synchronize developments between the art and means of command; that is, to maintain a balance between technological innovation and the human dimension. In any case, we must be prepared to win decisively with minimum casualties at the least cost to soldiers and the nation.

If the commander is not prepared, how can we expect anyone else to be?² How can we know if the commander is prepared if we do not know what he needs or what he is supposed to do? How can we develop and select the commander if we cannot articulate the skills and competencies required of him? How will we field systems to support him if we do not know what the requirements are?

FM 100-5 begins to answer these questions. Actions such as lead, decide, visualize, assimilate information, team build, communicate, anticipate, motivate, direct, adjust and demonstrate physical and moral presence describe what the Army expects of its commander in battle. The doctrine raises the question of command as art or science and emphasizes the requirement for the commander who has an intuition and feel that is gained from years of practice and study.

Battle command is explained as the expression of the will of the commander. It includes the commander's ability to visualize the current and future state, to formulate and articulate concepts of operations that link the two, and then through force of will and leadership, to move his command from one to the other at the least cost to soldiers and the nation. In its simplest form, the art of battle command is to the commander's

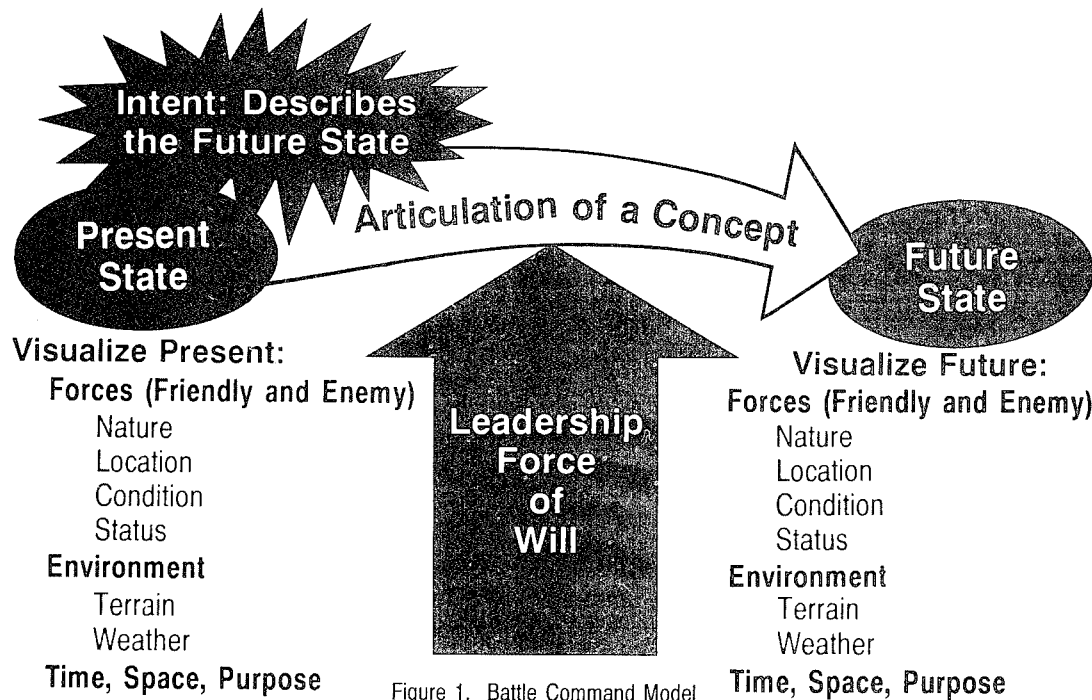


Figure 1. Battle Command Model

battle-focused leadership and battlefield judgment that begins to shape his unit upon assumption of command as illustrated in Figure 1. Its application allows the commander to set the conditions for battle, to see and understand the battlespace dynamically in all four dimensions (three of space and one of time) and to invoke the force of will to move the force to victory.

These are concepts writ large. However, the variables involved are too numerous and their interrelationships too complex to reduce them to formulae, checklists or cookie cutter approaches. There are discernible patterns whose underlying fractals can be identified, articulated and understood. These include the tenets, dynamics and fundamentals of battle command. These aspects of battle command should be considered as the doctrine and practice evolve.

Evolving Battle Command Doctrine Proposals

General George C. Marshall remarked that "The leader who would become a competent tactician must first close his mind to the alluring formulae that well-meaning people offer in the name of victory. To master his difficult art he

Battle command is . . . the commander's ability to visualize the current and future state, to formulate and articulate concepts of operations that link the two, and then through force of will and leadership, to move his command from one to the other at the least cost to soldiers and the nation.

must learn to cut to the heart of the situation, recognize its decisive elements and base his course of action on these. The ability to do this is not god-given, nor can it be acquired overnight; it is a process of years. He must realize that training in solving problems of all types, long practice in making clear, unequivocal decisions, the habit of concentrating on the question at hand, and an elasticity of mind, are indispensable requisites for the successful practice of the art of war." His insights about leadership and the art of command are as applicable today as they were 50 years ago.

Battle command embraces nine fundamental tenets, five of which are army operations—initiative, agility, depth, synchronization and versatility, as they apply to commander behavior and actions—and flexibility, judgment, intuition and empathy. These tenets describe the characteristics of the successful battle commander.

Battle Command Tenets

A tenet is a basic truth held by an organization. Battle command embraces nine fundamental tenets, five of which are army operations—initiative, agility, depth, synchronization and versatility, as they apply to commander behavior and actions—and flexibility, judgment, intuition and empathy. These tenets describe the characteristics of the successful battle commander. The inability of a commander to operate within these principles makes success difficult and costly to achieve.

Flexibility. Allows the commander to adapt his decision-making process and leadership style to different situations. It permits the commander to exploit opportunity within higher commanders' intent based on the situation. It is the sense that tells the commander when to go by the book and when the rules no longer apply. Flexibility is encouraged by a commander who makes his intention clear but does not impose detailed tasks on his subordinates. It is also encouraged by allowing subordinates to change their orders within the scope of higher commanders' intent based on the situation. Flexibility fosters independent initiative and ingenuity allowing the commander to achieve a constructive balance between the complex and often paradoxical forces with which he is confronted.

Judgment. Is the process of forming an accurate opinion or estimate based on available information. Battle judgment is the ability to analyze a situation and make the right decision.³ No

formula exists for developing this skill in the commander. It can only be acquired through time, study and experience. Some commanders acquire it early in their careers. Some will never have it.

Battle judgment forms the foundation for selecting the critical time and place to act, assigning missions, prioritizing, assessing risk, allocating resources, making adjustments and leading soldiers. Thorough knowledge of Army doctrine across each BOS and the combat function processes, such as intelligence preparation of the battlefield and wargaming, a strong ethical sense and understanding of enemy and friendly capabilities, form the basis of battle judgment. However, without self-trust and confidence in subordinates to act, good battle judgment is useless.

Intuition. Is the ability to demonstrate immediate understanding of the important aspect of a situation without evident rational thought and inference.⁴ It is born from the range of experience and reflections upon similar occurrences by the commander in the course of his development as a leader. It is the insight that rapidly dismisses the impractical solution and moves to the feasible course of action. Even in the best of circumstances, the commander will not have perfect knowledge of the situation. The battle commander must often bridge the gap between what he knows and what he needs to know at the time a decision is required with an intuitive understanding and feel for what needs to be done.

Empathy. Is understanding, being aware of, being sensitive to and experiencing the feelings, thoughts and experiences of soldiers and their families. It is key to leading and motivating soldiers and understanding what they are capable of doing at a given time. Setting the conditions for success in battle requires a balanced, comprehensive approach to meeting soldiers' intellectual, physical, social and spiritual needs during peace.⁵ Command, particularly in battle, means being with soldiers, sharing their hardships, feeling their pride—and often their pain—yet continuing to think and act to accomplish the mission with least cost to them.

Battle Command Dynamics

Six primary elements—leadership, decision making, information assimilation, visualization, conceptualization and communication—are all balanced by the commander. As with the tenets of battle command, the commander must balance these complex, dynamic forces, sometimes in paradoxical juxtaposition. The classic example of this balancing act is achieving balance between mission accomplishment (decision making) and men (leadership). As Arleigh Burke remarked in *Battle Report*, “Without the stress and the strain and the limit on time, nobody can actually duplicate the strain that a commander is under in making a decision.”

Leadership. Is described as the most essential dynamic of combat power in FM 100-5. It allows the commander to execute maneuver, build firepower and protect his force. Battle-focused leadership holds the commander's actions to a litmus test of preparing his soldiers and unit to be victorious in the next battle and is based on the values of integrity, courage, candor, competence and commitment.

Battle-focused leadership derives from the commander's technical competence, discipline and motivation.⁶ *Technical competence* is the product of knowledge derived through training, a positive attitude and development of habits that result in automatic, appropriate action in the face of fear. The *discipline* that underpins battle-focused leadership is not merely unhesitating obedience to orders. More important is self-control that leads to doing the right thing in the absence of clear direction. *Motivation* drives the commander to apply technical competence and to remain disciplined. It is the belief in his soldiers and in the nation that derives from self-esteem and self-respect.

Decision making. Is knowing if a decision is required, then when and how to make it. The best intelligence and friendly force information are worthless unless the commander knows when to act and is willing to act. No matter how well automated, no matter what level of technological sophistication of the processes and procedures built into command and control hard-

Tactical satellites enhance the 2d Infantry Division commander's ability to control battlespace and communicate his intent to subordinate maneuver elements.



[Communication] is the bridge that links information to decisions and decision to action. The commander must be able to receive and transmit information from a variety of sources over a variety of media. A climate conducive to open and honest communication eliminates some of the noise created by human reactions to the stress of battle, and it fosters implicit communications . . . [which] are faster and more effective than detailed explicit communications.

ware and software, systems do not make decisions; commanders do.

The hardest decisions that the commander has to make are not technical or tactical. They are *people* decisions, such as deciding who will not be able to cut it and what to do about it; deciding where capable subordinates can best serve; and deciding subordinates' relative strengths and weaknesses. Intellectual honesty is important.

Battle-focused leadership derives from the commander's technical competence, discipline and motivation. Technical competence is the product of knowledge derived through training, a positive attitude and development of habits that result in automatic, appropriate action in the face of fear.

The hardest decision a commander may ever have to make is to relieve a subordinate. Ultimately, the most difficult decisions concern people.

Information assimilation. Is the ability to take available information into the mind and thoroughly comprehend that which is important. Assimilation is the first step toward analyzing information fragments and synthesizing them to form a mental vision of the situation. It is facilitated by information management and allows the commander to separate that which is critical to mission accomplishment from that which is merely urgent or time sensitive. There is a confounding effect that occurs when the commander is overloaded with a large number of accurate information fragments, some of which may be relevant and some which may not. Staffs exist to organize and manage information for the commander to minimize this confounding effect. The commander, however, must determine the priority of, and reaction to, the information he receives. He does this personally or through explicit delegation.

The commander must ensure that the organization is tailored to provide the depth of information and support to the decision-making process he requires, especially during combat operations. Battle command systems must be flexible, robust and tailored to provide the critical information that allows him to lead and decide.

Over time, in battle, especially fast-tempo battle, the number of people who are helpful to

the commander in solving problems diminishes rapidly because not all can keep up with rapidly changing information.⁷ The commander is able to position himself to gain access to the most critical and most current information while the majority of his staff remains in the command post. During fast-tempo battle where the commander is moving about the battlefield, his information may be more current than his staff's. The commander may then be faced with the dilemma of either operating without his staff or slowing down to let them catch up. Running estimates require running information and dynamic thinking.

Visualization. Is the act of forming a mental picture of the current and future state based on higher commanders' intent, available information and an intuitive feel of the battlefield. Seeing enemy and friendly forces and terrain in terms of time, space and purpose forms the basis of the commander's estimate. While a portion of the desired future state may be dictated by a higher level commanders' intent, the battle commander must possess the ability to envision his organization's future state within its assigned battlespace.

Experience in sensing the battle, knowing the enemy and knowing how long it takes to get things done allows the commander to picture the battle in his mind. Often this picture is formed from the radio reports he receives. In these cases, the commander "sees" with his ears. Memorization of the terrain and associated graphic control measures and familiarity with his unit's disposition permits the commander to "see" information he gets over the radio as it applies to the situation. The commander must be able to picture the situation for himself to be able to communicate his orders to subordinates. He must translate, then transmit his vision into terms soldiers understand and can execute. He must not only form the picture of the current and end states, together with the bridge of action that will link the two in his own mind; he must also be able to form this picture in his soldiers' minds.

Conceptualization. Is the mental wargaming done by the commander to arrive at the best

course of action to link the current state to the desired end state. It is a dynamic process based on running estimates, visualization of the changing battlespace and the commander's experience that allows him to establish connectivity between current operations and the future plan. It is not based solely on deliberate, doctrinally correct processes, but also on cognitive processes that we are just beginning to understand. It begins with the commander's intent and results in adjustments to the plan as the commander anticipates changes and innovatively reacts to them. Conceptualization includes the problem analysis done by the commander when things go wrong. That analysis begins with him at the center and moves outward into the organization. Conceptualization also allows the commander to optimize the risks inherent in a given operation as opposed to the deliberate decision-making process that tends to minimize risk taking by the unit.

Communication. This is the bridge that links information to decisions and decision to action. The commander must be able to receive and transmit information from a variety of sources over a variety of media. A climate conducive to open and honest communication eliminates some of the noise created by human reactions to the stress of battle, and it fosters implicit communications.

Implicit communications—the ability to communicate through mutual understanding, using a minimum of key, well-understood phrases or even anticipating each other's thoughts—are faster and more effective than detailed explicit communications. The ability to communicate implicitly is developed through familiarity and trust, which are based on shared values and experiences.

Explicit communications—the ability to communicate through precise, crystalline written or oral instructions—are equally important. They are required to ensure important information is understood. The ability to communicate explicitly results from a clear vision of what must be accomplished, a mastery of the use of language, consistent use of doctrinally correct

In battle, the commander must . . . be able to visualize the current state and the future state of his unit within higher commanders' expectations, and he must be able to accurately assess his own and his unit's capabilities. In peace, however, the commander must not only strike a balance in the dynamic tension created by these requirements; he must also balance the requirements for battle-focused training with stewardship of available resources.

terms and use of the most effective media available.

The quality, quantity and direction of communication flow within a unit are indicators of unit performance. The commander sets the pattern.

Battle Command Fundamentals

Noted battlefield general and strategist Sun Tzu stated that, "If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself, but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy or yourself, you will succumb in every battle." Joint Pub 1 purports that Sun Tzu's advice is still cogent after 2,500 years. "Knowledge of self is required for effective joint operations. The first priority is to have a full and frank appreciation for the capabilities and limitations of all friendly forces. . . . Knowledge of the enemy is a preeminent but difficult responsibility. Traditionally, emphasis has been on understanding enemy capabilities; but knowledge of enemy intentions can be equally or even more important, to the extent that it sheds light on enemy plans and allows us to take timely and effective action to blunt them. . . . Knowing oneself and the enemy allows employment of friendly strength against the enemy's weaknesses and avoids exposing friendly

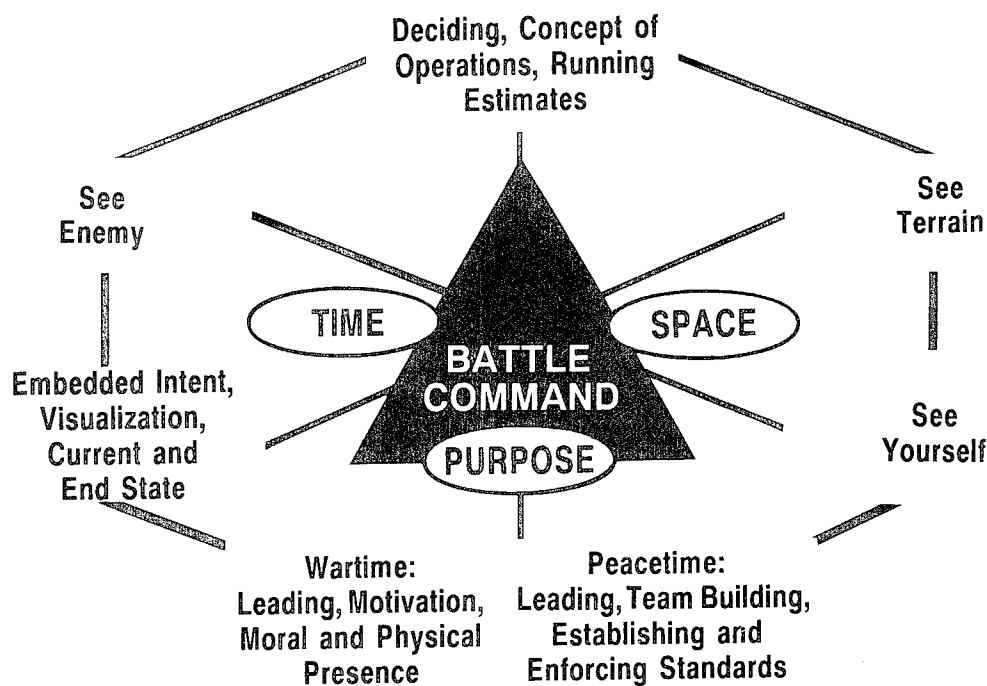


Figure 2. Battle Command Fundamentals

weaknesses to the enemy strengths.”

Two underlying fundamental patterns of forces and interrelationships are discernible with regard to application of the art of battle command. One has to do with command in battle and the other with command during peace.

In battle, the commander must balance six forces in terms of time, space and purpose. He must be able to see the terrain, see the enemy and see himself. As depicted in Figure 2, he must be able to lead, motivate and demonstrate moral and physical presence. He must be able to decide, maintain running estimates of the situation and formulate concepts of operations. He must also be able to visualize the current and desired end states within higher commanders’ intent.

In garrison, during peace, the commander must still be able to decide, maintain running estimates of the situation and formulate concepts to accomplish actions that will set the conditions for future victories. As in battle, he must be able to visualize the current state and the future state of his unit within higher commanders’ expectations, and he must be able to accurately assess his own and his unit’s capabilities. In peace, however, the commander must not only strike a balance in the dynamic tension created by these requirements; he must also balance the

requirements for battle-focused training with stewardship of available resources as well.

Teaching, Coaching and Mentoring Battle Command

The following approach to teaching, coaching and mentoring battle command was pioneered by Colonel Russel L. Honoré, senior mechanized trainer, and the *Scorpion* team at the National Training Center. It has been successfully used by senior observer controllers at the Joint Readiness Training Center, and efforts are under way to integrate this approach into leader development at the US Military Academy, the Reserve Officers’ Training Corps and other combat training centers.

It begins by developing a level of understanding of the concept of battle command as articulated in FM 100-5. These fundamentals can help establish the conditions for trainers of current or future commanders to coach, teach or mentor the art of battle command using the Socratic method. The Socratic method applied to coaching battle command is personable, private and one-on-one.

After an event that has allowed the mentor to observe the commander’s performance, the men-

tor, using one of the fundamentals of battle command asks which fundamental the commander thinks is most important to the training event just completed. The fundamental may be important because it was done particularly well or because it is an area the commander identifies as a weakness. If there is a particular point the mentor wants to make, he can also ask the observed commander about a specific fundamental.

The mentor quickly gets to the truth about what happened in the training event with regard to the selected fundamental through the use of analysis slides, graphics, notes or other aids that may have been prepared for the after-action review. The trainer then asks a series of leading questions based on cause and effect to bring the commander to some conclusions about what he did, what the results were and what he might do differently in the future.

As in any learning situation, for this approach to work, the teacher must know more about the subject than the student. This approach can be used with constructive or live simulations to provide focused feedback and self-discovery directed at improving battle command competencies.

This article has attempted to move the mark in the discussion and understanding of battle command. It has reviewed existing battle command doctrine and has proposed the addition of battle command tenets, dynamics and fundamentals. An approach for teaching, coaching and mentoring battle command was suggested. While this article is not a definitive treatment of the art of battle command, it will hopefully stimulate the thought and actions required to crystallize

Assimilation is the first step toward analyzing information fragments and synthesizing them to form a mental vision of the situation. It is facilitated by information management and allows the commander to separate that which is critical to mission accomplishment from that which is merely urgent or time sensitive.

the Army's concept of battle command as it applies to changes in doctrine, training, leader development, materiel and soldiers. Such a concept is required to provide the continuity that will allow us to leverage change in our world as the Army moves into the next century. It is also required to pull the right information age technologies through our Enhanced Concept Based Requirements System for use on the Force XXI digitized battlefield. Most important, a clear concept of the art of battle command will help us prepare, support and select Force XXI commanders. *MR*

NOTES

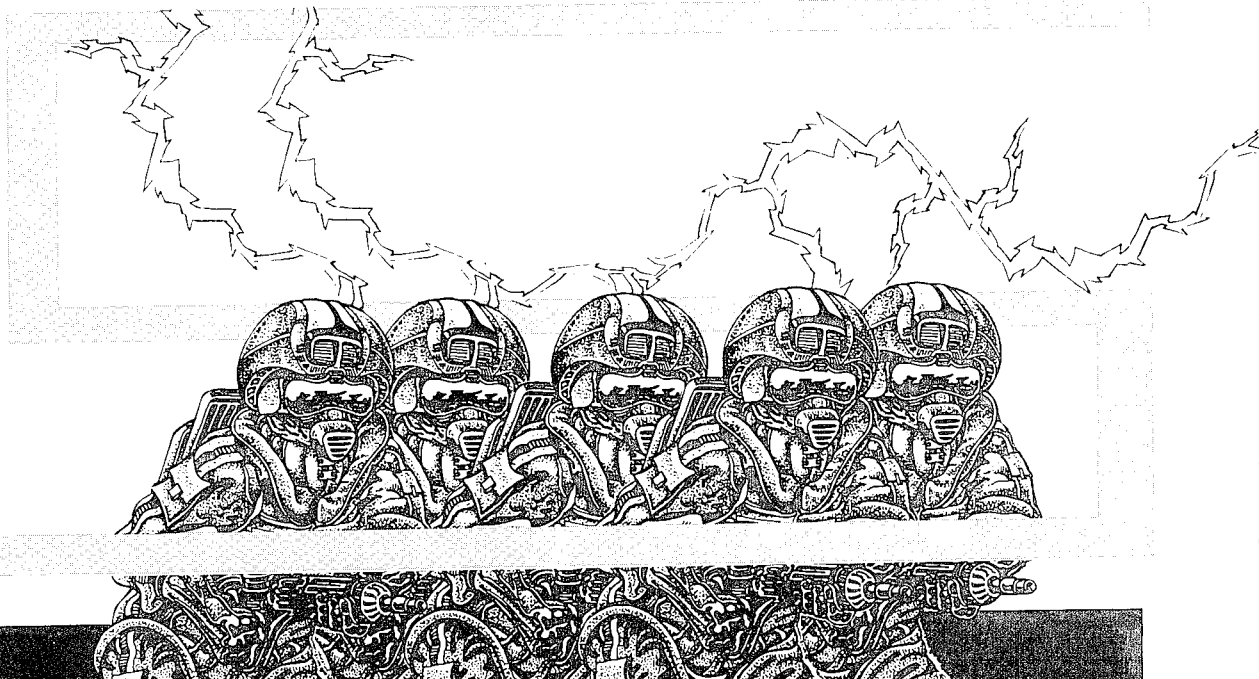
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Harnessing Battlefield Technology

As America's Army shifts its intellectual and physical focus away from Cold War and Industrial Age warfare, integrative technology will yield new combat capabilities that will revolutionize the Force XXI battlefield. Rapid technological advances will continue to direct the way we collect, communicate and use information. Microprocessing technology has already resulted in a proliferation of communications and information devices, causing an unparalleled rise in cultural and political consciousness. In short, information technology will ensure that future operations unfold before a global audience. Information technology will give US forces the capability to conduct and dominate increasingly sophisticated information operations by manipulating, isolating and controlling portions of the electromagnetic spectrum. We must accelerate capabilities integration in harnessing digital communications, intelligence, global positioning and navigation to increase the commander's capacity and operating tempo. Disrupting an opponent's ability to use these systems while protecting our own will prove crucial in 21st-century operations.



Neocortical Warfare?

The Acme of Skill

Colonel Richard Szafranski, US Air Force

This is the key point: the effective employment of air and space power has to do not so much with airplanes and missiles and engineering as with thinking and attitude and imagination.¹

—General Merrill A. McPeak,
Chief of Staff, United States Air Force

IF GENERAL McPeak is correct, and I believe he is, the opposite proposition should also be true. That is, if our country employs air and space power thoughtlessly or unimaginatively, this power will be less effective or even disastrously impotent. To help avoid such grave risks in the future, the thesis of this article takes us at least one step beyond McPeak's already powerful insight. This article argues that military power resides in the domain of the mind and the will; the provinces of choice, "thinking," valuing or "attitude," and insight or "imagination." Further, it argues that, because of this, military power can increase in effectiveness even as it decreases in violence. As a consequence, the article necessarily infers that air and space operations help establish the essential preconditions for meeting national security political objectives without force, or what I call *neocortical warfare*.

Some warnings: to me, "super" power is the capability that emerges from superior minds—the mental dimension and superior values, the moral domain. As you will see, military power, like air and space power, also takes on a different meaning. Consequently, "employment" ultimately attaches more importance to communicating with other minds than to targeting objects. Even so, I do *not* argue that we should beat our swords into fiber-optic cables or satellites. Rather, I argue that we transform our sword into a viciously sharp stiletto and

that we develop, refine and continually employ other, and ultimately more useful, weapons to influence adversary choices. Last, and most important, this is a work in progress. As such, the conclusions reached are both tentative and speculative, hopefully providing some signposts to un- or under-explored areas.

What We Think We Know

In their grand synthesis, *The Lessons of History*, Will and Ariel Durant assert that "the laws of biology are the fundamental lessons of history." They describe nations or states as biological organisms, human organisms, ourselves multiplied, our good and evil natures writ large.² Some states have the same flaws as humans—avarice, pugnacity, pride, the selfish desire for resources and mastery—and, like humans, compete and engage in misbehavior. Historically, war has been a necessity, the biological nation's way of eating, and a recurring form of misbehavior to the Durants.³ Analogies suggesting that states are like biological organisms are convenient, simplistic and, of course, flawed. States or nations are organized groups of people. States do not act—compete, misbehave, conduct raids, execute air strikes, wage war—it is people within the group who sanction or compel these, or who act in the name of others. Hence, to Martin van Creveld, "War . . . is a social activity resting upon some kind of organization."⁴

Society is and segmented societies are the workplace of warfare, and social change is both a cause and outcome of human conflict. People are the essential element in all of this. John G. Stoessinger's study of seven wars concludes that the "human element," including "personalities

Russian air defense personnel operating a radar system. Adversaries using this and similar high-tech equipment are vulnerable to everything from aerial feints and selective jamming to computer viruses.



Neocortical warfare . . . strives to influenc[e], even to the point of regulating, the consciousness, perceptions and will of the adversary's leadership: the enemy's neocortical system. In simple ways, neocortical warfare attempts to penetrate adversaries' recurring and simultaneous cycles of "observation, orientation, decision and action." In complex ways, it strives to present the adversary's leaders with perceptions, sensory and cognitive data designed to result in a narrow and controlled (or an overwhelmingly large and disorienting) range of calculations and evaluations.

and misperceptions," constitutes the final and critical link in the chain of events that culminates in war.⁵ Just as there are "disorganized personalities" among individuals, there may also be, in a lay person's terms, crazy leaders and, because of them, crazy states. War, aggressive or defensive, occurs as a consequence of human choice, of "conation," of will. Whether the people willing or choosing are sick or healthy, pugnacious or passive, war is a distinctly human activity.

Politics is also a human activity. "Politics" is the pursuit and exercise of power, and "power" is the ability to influence people who otherwise

might not choose to be influenced.⁶ To many, this ability to influence is seen as coercive, so much so that the "other means" Clausewitz describes as being added to the process of political dialogue in war are most often *violent* means. Consequently, among all the mammalian species on the planet, ours is the only one that engages in deliberate, intentional interspecific killing.⁷ Today war is understood as violent conflict, an activity that resides at the high end of the spectrum of coercion. Warfare or war emerges when humans and human organizations choose to oppose their wills, to employ destructive means in an organized way. The object of war is, quite simply, to force or encourage the enemy to make what you assert is a better choice, or to choose what *you* desire the enemy to choose. Said another way, the object of war is to subdue the hostile will of the enemy. We cannot meet the immediate objective of war until or unless we subdue hostile will.

So far, we are on familiar ground. It is not difficult to understand "destructive means." They are the more or less brute force mechanisms and methods employed to imperil the life of biological organisms (individuals) and organic entities (states, nation-states, nations or groups of people) either directly or indirectly. We have no difficulty understanding that living organisms and organic entities are organized as systems. It also may be unremarkable to conclude that the methodical orchestration and application of destructive means against these systems are superior to disorderly or less orderly ones.⁸

It is, however, somewhat more difficult to realize that, if the object of war truly is *to subdue hostile will* or *to make the opponent comply with our will*, then we must consider enemies not just as systems, but as organisms with will. Likewise, if weapons are *means used to coerce an adversary's will*, then even our understanding of weapons must go beyond things, implements or tools. Yet, we have concentrated our attention on the *concrete* means and *material* ways used to subdue hostile will's *host*, rather than on the nature of will itself. We have been unimaginative. As a result, we have been approaching the study of the art of war from a dangerously wrongheaded perspective. This is forgivable and, until recently, a

flaw we could afford. It is also a flaw we can choose, or will, to correct.

It is pardonable because the notion of will is an abstruse one. Will is as difficult to understand as concepts of mind, consciousness, cognition and creativity. Ideas of psyche, spirit, transcendence and soul are even more contentious, more difficult to comprehend. Because we believe that the entity "will" is existential and brain-centered, we concentrate our attention on the existence of brains, not on the nature of will. In so doing we may have mistakenly identified the craft of war as the *art* of war. By that I mean that our science of war is not so much the study of subduing will as it is the study of devising and applying progressively more elaborate means and methods for destroying brains. Destroy enough brains, or the correct brains, our studies seem to encourage us, and "will" necessarily dies along with the organism. Thus, we meet the *real* object of war—subduing will—if we meet it at all, indirectly by the application of physical force.

At least three shortcomings to this approach are emerging. First, killing appliances and destruction machines are usually and necessarily expensive. The more ambitious the objectives of this apparatus, the greater the expense. Every penny spent to acquire the ability to destroy is a penny that cannot be spent to build. Second, in the absence of any clear and present threat to national survival that possession of such tools can reasonably be expected to counter, our citizens and their elected representatives have advocated other plans for our pennies. Last, the intellectual energy consumed by devising newer and better ways to kill and destroy distracts us from the real object of war: subduing hostile will. Lopping the limbs off an enemy's body, or even precisely excising muscles from it, undoubtedly sends a message to the enemy's brain. Might there not be other ways to communicate with hostile brains?

The architect of the 1929 "strategy of the indirect approach," B. H. Liddell Hart, advocated a more economical approach to meeting the aim of war. Yet, even he saw the "dislocation of the enemy's psychological and physical balance" only as "the vital prelude to a successful attempt" to overthrow the enemy. Psychological dislocation occurred when one gained a favorable "stra-

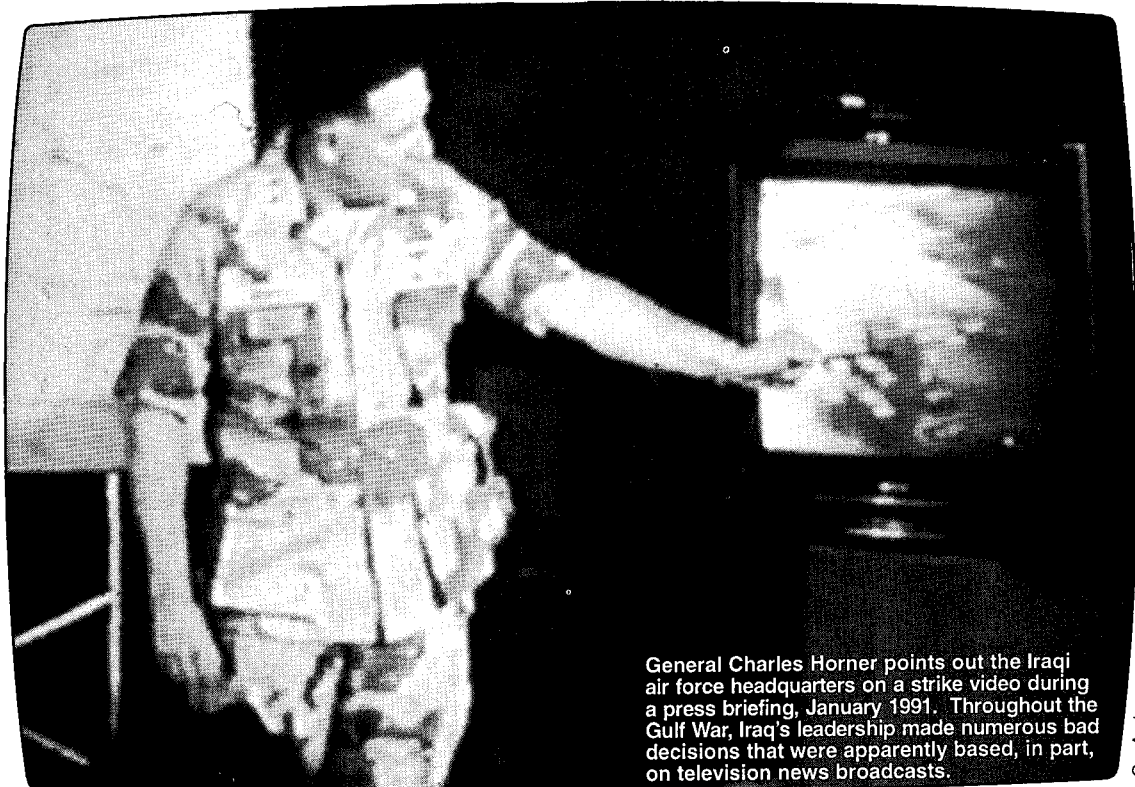
tegic situation," but even then, it took a "strategic operation" to meet the military aim. Hart insisted that a strategic operation was not a "battle," but accepted that a battle might be necessary to

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achieve a decision.⁹ If the object of war is to subdue hostile will, perhaps we would be wiser to approach the indirect approach more directly.

What if we viewed war not as the application of physical *force*, but as the quest for metaphysical *control*? What if we pursued the possibility that war might have as much or more to do with the idea of willpower and non-fighting than it does with the idea of physical power and fighting? Remember, it was Sun Tzu's assessment that "To subdue the enemy *without fighting* is the acme of skill." It follows, then, that *not* to subdue the enemy at all, or to subdue the enemy by fighting, would fall far short of the acme of skill. If, for example, Operation *Desert Storm* was a success, that is, it subdued hostile will, it is difficult to explain Saddam Hussein's continuing willful behavior. Viewed in this light, we did not even approach the acme of skill in the "last ancient war."¹⁰

We suspect that it might be valuable to pursue ways to subdue an enemy without fighting. It might bear fruit. After all, physical fighting is costly, with the winner and the loser both paying great expenses in blood and treasure. The hostile will attacked by physical means in one war often emerges later and with greater hostility in a new war. Moreover, the principal theorists or artists of warfare—Krishna of the *Bhagavad-Gita*, Sun Tzu, the Khan, Machiavelli, Lenin, Liddell Hart, Mao, John Boyd—and many of the masters of



General Charles Horner points out the Iraqi air force headquarters on a strike video during a press briefing, January 1991. Throughout the Gulf War, Iraq's leadership made numerous bad decisions that were apparently based, in part, on television news broadcasts.

Guy Aceto

The aim [of neocortical warfare] is not merely to avoid battles. The aim is to cause the enemy to choose not to fight by exercising reflexive influence, almost parasympathetic control, over products of the adversary's neocortex. In actively enjoining the minds of adversaries to not fight, we must understand the adversary's culture, world view and the representational systems the adversary recognizes, values and uses to communicate intent.

the craft of war—Napoleon, Clausewitz, Guderian, Patton, Slim, Magsaysay, John Warden—emphasize the importance of the moral, the mental and the will in conflicts.¹¹ So important are these cerebral, metaphysical things that Eliot A. Cohen and John Gooch hint that much military failure might have its genesis in the “psychological cripples” that rise to general and flag rank in the military hierarchy.¹²

To continue our inquiry we must accept that will is existential and brain-centered, and enter the human brain.

According to Paul McLean, the human brain is actually three brains in one, a “triune” brain. Each brain is specialized in function and interconnected with the other brains. The *reptilian* brain comprises the brain stem, the midbrain and the basal ganglia. It controls the reticular activating system, breathing and heart rate. With only the reptilian brain, we would be cold-blooded

reptiles.¹³ The *limbic* brain surrounds the reptilian one. The limbic is a paleomammalian, or early mammal brain. According to Robert Ornstein and Richard F. Thompson, it is the source and regulator of the basic mammalian survival activities: feeding, fighting, fleeing and sexual reproduction. Ned Herrmann describes its contributions as controlling the autonomic nervous system and its involuntary responses. The limbic registers rewards, punishments and emotions. It maintains a hierarchy of dominance and submission within the species and between the organism and the environment. The limbic drives sexual courtship, “follow-the-leader” rituals and mass migrations. The limbic also conditions behaviors such as ganging up on the weak and the new, defending territory, hunting, bonding, nesting, greeting, flocking and playing.¹⁴ With only the limbic and its embedded reptilian brain, we would be warm-blooded mammals.

HARNESSING TECHNOLOGY

The capstone of the brain, as we know it today, is the *neocortex* or neo-mammalian brain. The neocortex comprises 80 percent of total brain matter. It enables us to think, organize, remember, perceive, speak, choose, create, imagine and cope with or adapt to novelty. Within the neocortex 180 billion neurons or nerve cells interact without any physical connection. The possibilities for interconnections between neurons in one human brain are "greater than the number of atoms in the universe," according to Ornstein.¹⁵

The triune brain also appears to have specialized hemispheres. The left hemisphere of the neocortex or the left brain, is the site of cognition. It processes words and numbers and organizes data in logical and linear sequences. Unlike the left brain, the right brain is more adept at registering the images, patterns, sounds and movement discernible in phenomenological perceptions or sensory input. Using holistic processing, the right hemisphere of the brain conceptualizes, hypothesizes and maintains an intuitive sense of the whole.¹⁶ Because Western oral and written language and scientific notation are linear and sequential, the left brain dominates these activities. Because creation is the product of illumination or insight, pattern recognition and new or hypothetical conceptual constructs, its source may be the right brain.

If F. S. C. Northrop is correct in *The Meeting of East and West*, "culture" conditions some of the operations of the left brain. Specifically, atmospheric and linear perspective in classical Western art and the syntax of Romance languages both work together to channel cognition in ways that are different from the ways that the "undifferentiated aesthetic continuum" of Eastern art and the "syntax" of the Asian word-picture or ideogram condition the thinking of those in the East.¹⁷ There is no "foreground, background or vanishing point" in Eastern art. There are no longer any pictographs in the Western alphabet. (Although the iconography of comic books and animated cartoons and the pixels of video are beginning to replace writing in our country. Someday these may constitute the new pictographs of an increasingly less literate United States.)

Some of these cultural variations in cognition and elucidation are clear when one compares the German version or an English translation of *On War* with any one of the many English translations of *The Art of War*, the *Canon Law* of Roman

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Catholicism with the "doctrines" of *The Tao Te Ching*, or the negative space in a Japanese watercolor with the meaning-filled space in DaVinci's "Last Supper." These differences merely are interesting at first glance, but upon reflection, understanding them is important to meeting the aim of subduing hostile will without fighting.

None of this should suggest that the left brain is inferior to the right brain. Nor does it pretend to understand either how the brain functions or how or when "mind" or "will" emerged from the brain structure. Each brain and then the triune brain probably evolved, or were naturally selected, in response to some massive, catastrophic environmental change or "bifurcation point," in Ilya Prigogine's terms.¹⁸ Perhaps the limbic evolved in response to a climatic change. The neo-mammalian might have evolved in response to competition for survival with other species.

The neocortical brain, unlike the other two brains, affords the opportunity to adapt in ways that sustain what might appear to be *unnatural* selection to some—the creativity that generates genetic engineering, artificial hearts and joints, organ transplants, and so forth. Indeed, the very highly developed neocortex, the brain that elegantly integrates both neocortical hemispheres, may even exercise some control over the sympathetic and parasympathetic responses of the central nervous system.¹⁹ Because of the interconnections (the *corpus callosum*, the *Hippocampal*



The view from a laser-guided bomb plunging toward the corner of a Libyan headquarters building directly across the street from an opulent tent that strong man Moamar al-Gaddafi was using as a temporary residence. After this strike, the incidents of Libyan-backed terrorism dropped to almost zero.

Politicians necessarily are experts in [neocortical] warfare. Hitler started one over six decades ago . . . [and] the Blitz itself used nightmare and terror to achieve its general effect even while relying on arms to attain its more specific aims. In our own country, President Kennedy's decision to ignore the more hateful of Khrushchev's two letters during the crisis over Soviet missiles in Cuba, for example, was critical in reframing the adversary's perceptions.

commissure, the anterior commissure) among all three brains and both hemispheres, the human brain structure truly makes us "the paragon of animals" on this planet.

Does it? Recall that ours is the only mammalian species that organizes for warfare and intentionally kills its own members. Do we do this because the reptilian brain forces us to kill for biological survival?

Do we kill because the limbic compels us to play, to hunt, to learn whether ours is the role of domination or submission? Perhaps we kill because our neocortex calculates that killing accrues some logical or hypothetical advantage. We kill, according to Desmond Morris, because we have artificial material weapons more potent than "tooth and nail." According to him, we developed physical weapons "primarily as a means of defense against other species and for the killing of prey."²⁰

Once we had weapons, they were readily available for uses beyond defense against other species and hunting for food. Among these other uses, weapons provide a means to express anger or serious displeasure, to coerce, to make some risks and consequences mortal. We chose, for whatever reason, to invent weapons. We *choose* to use weapons and engage in warfare. One reason is because battles and warfighting are satisfying in a paleomammalian and a neo-mammalian way. They provide what John Keegan calls "moral consolations," including "the thrill of comradeship, the excitements of the chase, the exhilarations of surprise, deception and the *ruse de guerre*, the exaltations of success, the sheer fun of prankish irresponsibility."²¹ Some of these are limbic stuff; bonding, ganging up and all the chemical or hormonal effects of the massive activation of the sympathetic nervous system that occur in response to anger and fear. Others—the exhilaration of surprise and the fun of violating norms—are more neocortical. It is "war alone," writes Martin van Creveld, "that both permits and demands the commitment of *all* man's [*sic*] faculties, the highest as well as the lowest."²²

Passion alone can sustain war, but logic alone cannot stop fighting. Little is simple for the paragon. Our left brain science, for example, is dependent on the illogic, or perhaps different logic, of the right brain. Things essential to science cannot be proven by science: the principle of causality, theories founded on the logical error of affirming the consequent, acceptance of the principle of limited variability and the unverifiable principle of verifiability, for example.²³ That "deterrence theory," firmly grounded in the *post hoc* fallacy, survived and eventually confounded the now defunct Soviet experiment

shows the value of coupling imagination, illogic and logic.

The complex interactions among brains, hemispheres and environments continue. In teaching us what we cannot know or predict, Heisenberg's uncertainty principle, Godel's proof, the Einstein-Podolsky-Rosen effect, Bell's theorem, Aspect's experiment and the recent exploratory sorties into the world of chaos and nonlinearity illuminate some of the capability of the aroused neocortex.²⁴ Alan Beyerchen's reframing and rendering of *On War* in defense of Clausewitz in "Clausewitz, Nonlinearity, and the Unpredictability of War" takes what appears to be a new reality—nonlinearity—and applies it to an old paradox: war.²⁵ Likewise, Alvin and Heidi Tofflers' *Third Wave* and John Arquilla and David Ronfeldt's discussion of netwar and cyberwar are excellent works that suggest fertile new directions in war and "anti-war."²⁶ Many of the bits and pieces suggestive of a theory of neocortical warfare seem to be falling in place.

What May Follow From What We Think We Know

The triune brain suggests an analogy. Might there not also be three approaches to warfare? The reptilian approach is animalistic fighting. The socially organized paleomammalian approach relies on hunting and on ganging up to make the kill. The neo-mammalian approach requires greater organization, integration and the conceptualization of time and space. It relies on calculations, logic and sequential thinking to make the kill. This third approach also allows more discriminating application of brute force.

Even so, the neo-mammalian approach also may have within it left or right hemisphere-dominant approaches. Campaign planning, with its current emphasis on the linear processes of a system (like the military's current application of "total quality management"), predominantly is a left hemisphere-dominant approach. In this scheme, the enemy is a system, an assemblage of production nodes controlled by an organic brain. The campaign applies physical force to these nodes, as targets, using a presumed calculus that assesses effects on the whole system. A right brain-dominant approach, on the other hand,

might suggest reframing conflict as warfare against minds and envisioning weapons as any means used to change the enemy's will.

As the right and left brains interact, the enemy is not seen as an inorganic system with multiple

Global instability . . . may pose less of a danger than our own lack of intellectual agility, our own lack of imagination, myopic vision and bad choices. . . . Whether we [envision] "win, hold, win" or "win, win" wars, regional wars can be nothing but "lose, lose." As an alternative to unimaginatively planning to fail, perhaps we could put our imaginations and our entire neocortex to better use by pursuing neocortical warfare.

centers of gravity, but as other neocortical organisms. Neocortical warfare is warfare that strives to *control* or *shape* the behavior of enemy organisms, but without destroying the organisms. It does this by *influencing*, even to the point of regulating, the consciousness, perceptions and will of the adversary's leadership: the enemy's neocortical system. In simple ways, neocortical warfare attempts to penetrate adversaries' recurring and simultaneous cycles of "observation, orientation, decision and action."²⁷

In complex ways, it strives to present the adversary's leaders—its collective brain—with perceptions, sensory and cognitive data designed to result in a narrow and controlled (or an overwhelmingly large and disorienting) range of calculations and evaluations. The product of these evaluations and calculations are adversary choices that correspond to our desired choices and the outcomes we desire. Influencing leaders to not fight is paramount. Warfare is "organized" fighting. It becomes less organized, more nonlinear, more chaotic and unpredictable once it begins. Until battle (physical fighting) begins, the leaders can stop it more easily. In very complex ways, the neocortical approach to warfare influences the adversary leaders' perceptions of patterns and images, and shapes insights, imaginings and nightmares. This is all brought about

without physical violence. It is all designed to reorganize and redefine phenomenological designators to lead the enemy to choose not to fight. In neocortical warfare, enemy minds are the *Schwerpunkt* and armed military capability the *Nebenpunkte* (a term coined by John Boyd to mean "anything that is not the *Schwerpunkt*").

That nonfighting is the attribute and aim of neocortical warfare does not mean that this warfare is passive or inactive. It requires considerable effort, resources and skill—the acme of skill—to subdue an enemy without fighting. The aim is not merely to avoid battles. The aim is to *cause the enemy to choose not to fight by exercising reflexive influence*, almost parasympathetic control, over products of the adversary's neocortex. In actively enjoining the minds of adver-

saries to not fight, we must understand the adversary's culture, world view and the representational systems the adversary recognizes, values and uses to communicate intent. We must understand the adversary's verbal and nonverbal language. We might use tools similar to Richard Bandler and John Grinder's "neuro linguistic programming" to understand how the adversary receives, processes and organizes auditory, visual and kinesthetic perceptions.²⁸

Knowing what the adversary values and using the adversary's own representational systems allows us to correlate values, to communicate with the minds of enemies in the verbal and nonverbal language of the enemy. The objective is to shape the enemy's impressions as well as the enemy's initiatives and responses, pacing the

Theater Information Strategies

Colonel Jeffrey B. Jones, US Army

Winning the information war is essential to success on the battlefield—no one doubts that. Using emerging technologies to access the tactical situation on the ground to "get inside" the adversary's decision-making cycle or his operational ability to react is critical to attacking his centers of gravity and exploiting his weaknesses, thereby effectively concentrating our own combat power. But I want to address winning the information war at the operational or theater level. While the political, economic and military elements are evident in every unified command's overall strategy, there is seldom much discussion about the informational or psychological element—the fourth and often overlooked instrument of national power. Consisting of public diplomacy, public affairs and psychological operations (PSYOP), this instrument of national power could synergistically enhance the near- and long-term achievement of US national security objectives in each theater. What I am advocating is a "theater information strategy" for every unified command.

The most fundamental *raison d'être* of our Armed Forces is deterrence. Deterrence consists of a tangible capability in terms of force structure, weaponry and training and the knowledge of that capability among allies, friends, enemies and neutrals.

Important, too, is the perception of one's willingness to use that capability. In this context, I would argue that winning the information war encompasses successful information operations conducted before

combat. The success of these pre-hostility operations is every bit as important as their success in actual conflict and may in fact preclude combat operations.

Information Preparation of the Battlefield

In a time of decreased forward deployment and force structure, intermittent presence in key areas, reduced security assistance, increased instability and demand for US engagement, I believe we need a multifaceted theater information strategy in each unified command, which would provide both a peacetime and wartime *information* preparation of the battlefield. Driven by national-level guidance, such a strategy could help:

- Maintain and reinforce stability, peace and deterrence.
- Articulate enduring US interests and objectives, underscore US commitment and strengthen our credibility to friends, allies, potential enemies and neutrals.
- Explain US declaratory goals, the rewards for compliance and the consequences of defiance.
- Enhance our strengths and minimize our weaknesses.
- Reinforce allied resolve and stimulate allied political, economic and military contributions.
- Encourage allies, coalition partners and friends to reinforce these perceptions through key communicators, media and other sources.
- Eliminate or reduce the possibility of mixed or

enemy through the cycle of observation, orientation, decision and action. We attain the acme of skill when we meet our objectives and the adversary chooses the nonfighting alternative voluntarily, even unaware that our decisions and our behavior led to the reframing and the redecision reached.

The Acme of Skill: Reinventing Warfare and Weapons

The single most important change that has occurred on the planet since the advent of the neocortex is crowding and overpopulation.²⁹ Birth control and abortion are seen by some as a biological necessity even though constituting "aggression against zygotes."³⁰ These measures have delayed the gloomy predictions of The Club

of Rome and Donella H. and Dennis L. Meadows in *The Limits to Growth*.³¹ Nonetheless, population doubling times, depletion or appropriation of the net primary product (usable vegetable mass), the scarcity of nonrenewable resources and the restraints on individual freedom that lack of space and food may ultimately impose are all working together to make this *potentially* a small, dangerous planet. The collapse of the nation-state, the return to tribalism, a new Dark Age of fundamentalism or the "clash of civilizations" all loom as possibilities.³² Even so, the global instability caused by the collapse of the Soviet empire, the proliferation of nuclear weapons and ballistic missile technologies, the rise in self-determination, or the crosscurrents of persistent "waves" may pose less of a danger than our

conflicting signals, misunderstanding or underestimation of US resolve.

- Deter, postpone or contain conflict.

If Deterrence Fails

If deterrence fails, both public diplomacy and PSYOP become important adjuncts to combat power, particularly during the early stages of a crisis when only lightly armed rapid deployment forces are moving to or just arriving in a crisis area. They can keep an opponent's decision makers guessing as to the actual strengths, locations and composition of US and coalition forces; contribute to deception operations; cause enemy deployment fissures or encourage highly vulnerable enemy concentrations; foment discord, distrust, desertion, defection and, eventually, surrender; help discourage outside sources of political, economic or military support—all setting the stage for early capitulation, a shortened conflict and the saving of US, allied and enemy lives.

In addition, should we become engaged, a theater information strategy could help the US populace and members of its Armed Forces understand why we are engaged in an operation and that we are culturally sensitized. Such a strategy could also help preempt adverse publicity. Finally, as combat operations come to an end, a cohesive theater information strategy can help in the all important, multifaceted, multiagency and, in all probability, multinational efforts after the war. How we articulate, internally

and externally, what our goals and objectives are, how long we intend to stay and why we intend to stay, will, to a great extent, dictate the duration, cost and impact of our commitment. Also, a theater information strategy can strongly influence who is alongside us to help share the burden and shoulder the responsibility.

At the National Level

Theater information strategies must not be developed in isolation, but rather on the basis of thorough review and analysis of US interests and objectives in each region as well as guidance from a revitalized interagency public diplomacy coordinating committee (PDCC), consisting of representatives from the National Security Council, State Department, US Information Agency, Office of the Secretary of Defense, Office of the Joint Chiefs of Staff and the Central Intelligence Agency. Such overarching guidance must be provided annually as derived from US National Security Strategy and continuously refined. It should also address transnational issues such as counternarcotics and counterproliferation, which affect more than one theater. In times of crisis, the PDCC would provide specific informational or psychological objectives that would help frame the political-military context in which an operation might be conducted. It would also help coordinate US information efforts and develop and implement strategies to encourage supportive allied, friendly or neutral country initiatives and actions.

own lack of intellectual agility, our own lack of imagination, myopic vision and bad choices.

The co-evolving, co-dependent organisms on the planet, and its present nations, nation-states and groups, need to choose success strategies or failure strategies to manage conflict. In our own country, we may have reached the point where failure strategies include such concepts as armed forces sized to fight two wars, two "major regional contingencies," nearly simultaneously.³³ Whether we imagine they are "win, hold, win" or "win, win" wars, regional wars can be nothing but "lose, lose." As an alternative to unimaginative planning to fail, perhaps we could put our imaginations and our entire neocortex to better use by pursuing neocortical warfare.

We already have awareness of neocortical warfare and some skill in waging neocortical warfare against adversaries and friends alike. Politicians necessarily are experts in this type of

warfare. Hitler started one over six decades ago. Eric Voegelin observed in 1939 that, lacking "a profound and intimate knowledge of German cultural history and of the history of the German language in the last two centuries," non-Germans failed to appreciate the significance of Hitler's call for "neo-pagan" Germanic *Lebensraum*. As a consequence, non-Germans were effectively "screened" from Hitler's real expansionist motives.³⁴ The *Blitz* itself used nightmare and terror to achieve its general effect even while relying on arms to attain its more specific aims.

In our own country, President John F. Kennedy's decision to ignore the more hateful of Khrushchev's two letters during the crisis over Soviet missiles in Cuba, for example, was critical in reframing the adversary's perceptions. Likewise, our country's large military budgets were once the product of *hypotheses* of threats and dangers, *images* of falling dominoes, *visions* of

At the Joint Staff Level

At the joint staff level, the Joint Strategic Planning System would be modified to ensure this political-military context is not only considered during planning, but is also included as part of both the friendly situation and the commander's intent in all subordinate planning documents such as warning orders, operation plans, contingency plans and operation orders.

At the Theater Level

Given such guidance from Washington in peacetime, crisis and war, J5s at the unified command level would routinely convene an information coordinating committee to coordinate the various efforts of the J2, J3, public affairs officer, political adviser, US Information Service representative, perhaps other members of the US country team and PSYOP to ensure synergy and to reduce the probability of conflicting messages. Combined information committees could be created and convened to coordinate allied and friendly activities as well. As at the national level, the political context in which the operation was to be conducted would be included in appropriate places in all plans and orders—but in the base document itself, not buried in a seldom-read annex or appendix.

Technology

As we apply theater information strategies, particularly during crises, advanced and emerging tech-

nologies would be tapped, both to provide information conduits to our own strategic and operational decision makers and to convey information to the adversary's decision makers, armed forces, allies and populace.

The United States historically has orchestrated the political, economic and military elements of its power and influence credibly. However, one does not need to look very far for examples of our failure to plan, coordinate and implement information strategies to synergize the other three elements of power. Our public diplomacy experiences in Bosnia, Haiti and Somalia are the most glaring. Clearly, we need to fill this void. The mechanisms and expertise are all there—we just need acknowledgment that we can and must do better and design action plans to improve our disparate efforts. ■

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iron curtains and space shields, *theories* of nuclear deterrence, *metaphors* of escalation ladders and *nightmares* of an evil empire. Smaller budgets and smaller military forces follow in the wake of a *hypothetical* new world order, *theories* of defense conversion and *visions* of nuclear winter. These observations are small tests. What would it take to move us closer to a theory?

Analyze past and present conflicts of all kinds and in all arenas—politics, warfare, business, sports, and so forth. Look for apparently anomalous events where small, willful, fluid, fast-responding or mentally powerful forces overcame larger or more physically powerful ones. Scrutinize cases where physical attacks were unable to subdue will, such as at Stalingrad, Britain's "finest hour," Dresden, Vietnam, Afghanistan, the *intifadah*. Examine cases where nonviolence, mental attacks, nightmares, illusions, character assassinations or smear campaigns subdued hostile will, brought the mighty low or rendered the powerful impotent. Whenever the weak overcomes the strong using the power of mind or will, evidence of neocortical warfare exists.

We might then look forward and hypothesize that neocortical warfare has four characteristics. First, it recognizes that competition, conflict and conflict resolutions are permanent features of the human condition. The target of all human conflict, the battleground of all conflict resolution, is the human mind. In reframing all conflict as one form of warfare or another, neocortical warfare rejects the notion that warfare is an aberration. It accepts that conflict will never end and that we must invest resources to win its endless engagements. The Cold War may be over, but *cold* war must be the goal. Hence, military forces must envision themselves not just as "armed forces," but as elements of larger "national security forces" in neocortical warfare. Security, much to our chagrin, does not emerge from arms, but arms arise from insecurity. Conceptions of security or insecurity exist in the mind.

Second, a theory would accept that adversaries will wage—are waging even as you read this—neocortical warfare against us. (That China is quiet, for example, may not mean that we are not engaged in a conflict with China.) Neocortical warfare uses language, images and information

to assault the mind, hurt morale and change the will. It is prosecuted against our weaknesses or uses our strengths to weaken us in unexpected

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and imaginative ways. That being the case, we have less room for the unimaginative, the mentally weak, or whatever Cohen and Gooch mean by the psychologically crippled among our leaders. Leaders are critical nodes, the targets of neocortical warfare, and they must be prepared for the adversary's assaults.

Third, we should devote the weight of effort and more resources to the deliberate and continual pursuit of nonviolent influence over the adversary. The object is to understand the enemy well enough to condition or determine the choices the adversary makes. Using the adversary's lexicon, syntax and representational systems allows the neocortical warrior to lead the adversary through the cycle of observation, orientation, decision and action. Mastery is the result.

Fourth, lean, fast-reacting, violent, almost "limbic" forces—the stiletto held in readiness to coerce with force of arms—must be created or preserved to support neocortical warfare. In some cases we may have to introduce shock, surprise and terror in the adversary's external world, through what Arquilla and Ronfeldt call "the exemplary use of our military capabilities," to fuel the nightmares and disorientation sought in the enemy's internal world.³⁵ We should not and cannot foreclose on the possibility that small, tremendously violent demonstrations will be necessary in the future. Even so, we also should expect that evolving constraints will cause us to characterize all future lethal military operations as "special operations" and that the principal object of these operations will be

“psychological warfare.”

As a consequence, all armed military forces must be or become elite forces. “Elite” means people and forces selected, organized, trained and equipped to rapidly adapt to, and even shape, changing or unforeseen circumstances. Although armed forces must operate in all media, air and space forces will occupy a critical position in the future national security force. Air and space provide speed, the medium and the means of almost instantaneously communicating images and language, the reach to quickly span the globe.

How would we “operationalize” neocortical warfare? What are the national security force structure implications? What do we need to transform the abstract into the concrete? First, acquisition of the most robust, most comprehensive intelligence-gathering and information-disseminating apparatus in the world is essential. In neocortical warfare, *understanding* is power. This apparatus would be a better integrated intelligence and information agency or a network of agencies. It would combine the best capabilities and analysts of the Central Intelligence Agency, the National Security Agency and the Defense Intelligence Agency at a level below the senior interagency group. This new network would work in partnership with our foreign service, private sector field activities and deployed training and educational entities. It is an urgent requirement to resist any attempt to reduce our global collection and analysis capability. If we are to subdue enemies without fighting, we need more field agents, more intelligence-collection capabilities and systems to support the work of intelligence analysts.

We cannot hope to influence or condition what we do not understand. What are the values of the Serbs or the Iraqis? How do the Hmong or the Kurds organize sensory data? What are the differences in the way Albanians or Macedonians approach negotiations? What is the Achilles’ heel of a nation or non-state organized and operated like a business corporation? Inevitably, greater reliance on information systems equates to greater reliance on the use of space. Space systems provide a panoramic “view” of the earth across the electromagnetic spectrum. The technological exploitation of space can allow us to

see, hear and sense the adversary, to recognize patterns and changes, to ask the right questions, to send the right messages quickly.

We must exploit the medium of space. Vice Admiral Jerry O. Tuttle’s space and electronic warfare *Sonata* envisions one architecture that might begin to prepare us to fight prolonged neocortical warfare.³⁶ Other architectures aimed at providing national security in a broader sense will follow. Even so, we must appreciate that we cannot hope to control what we cannot see, hear or understand. (*Ninjitsu*, the art of invisibility, may be the best countermeasure to an adversary’s space or intelligence capabilities.)

Second, neocortical warfare requires a better integrated, joint civilian and military national security control force with both armed and unarmed elements. It must be capable of sustained, cooperative and nonlethal presence in every area we have interests. Elements of it must also be capable of prompt, noncooperative and violent combined arms intervention in denied or hostile areas *vital* to our interests. The lethal elements of this force, although small by today’s standards, must be morally, mentally and technologically superior to the elite guards that surround the leaders of the groups of the world. Space-based capabilities could provide these forces with information and vision. Air forces, as a category of force and not necessarily as a military department-specific force, provide the reach and a large share of the “touch” necessary for this armed portion of the force.

The nonlethal elements of our national security force deploy democratic values and behaviors within the context of local cultures; cultivate networks, markets and partnerships; teach basic skills; and penetrate the perceptions of the target country. The lethal elements would be organized as multifunctional or cross-functional teams or networks. These teams would understand the target country as a system of subsystems; know precisely when, where and how to intervene for maximum effect, and could execute overt or covert violent operations. This force will understand that, in the lexicon of the “quality” movement, the enemy is the “customer” and the enemy’s segmented society is the “workplace” of neocortical warfare. Since adversaries may

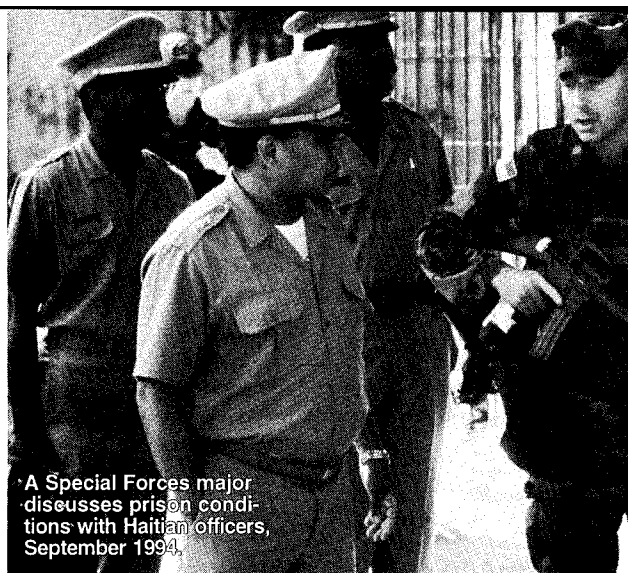
abound, global reach will be an important requirement in the world that is emerging.

Yet, in the future, "access" and "presence" are more likely to be the invitation to brandish our values and share our culture, than brandish our weapons and share our antiquated vision of military superpower. A revitalized and revised version of the Peace Corps and a reframing of the vision of the Army's Special Forces are required. Those who resist the assignment of non-military or nonlethal missions to the uniformed men and women who serve our country should thoughtfully reconsider our country's full range of national security needs in the future.

Third, and finally, those lethal forces we possess should be small. The active, standing component should be inadequate for any great mischief not supported by our Congress and the citizens it represents. If our Congress wants us to sortie out in large numbers to "win, win" or to "win, hold, win," then our Congress must consider the wisdom of appropriating the money to raise and support such an army. Today we may be too closely wed to military hierarchies (instead of networks) and a notion of command and control (instead of guidance and monitoring in accordance with the *Abseits*) that may discentrify authentic empowerment.³⁷ In the worst case, these command and control hierarchies may be sizing and shaping our huge forces as an unintended enticement to fail, making us unintentionally vulnerable to those who might lure us inadvertently into fighting the limbic warfare that willingness to become expert in neocortical warfare might avoid.

We should consider the possibility that today our Armed Forces may be less "armed" than they are fat with unarmed housekeepers: the administrators of contracts, records, regulations and red tape, those devoted to the maintenance of our camps, bases, factories, warehouses and hospitals. Fat can restrict the blood going to the neocortex, impede thinking and blur vision. Disorientation and confusion often result. Disorientation could lead to clinging to the past in the vain hope that size alone will allow the imposition of the past's structures on the present and the future.

In the view of the electorate, the idea of "forts"



A Special Forces major discusses prison conditions with Haitian officers, September 1994.

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inside the United States, for example, perhaps is now as antiquated as the notions of "commisaries" and "military family housing." The dangers of the frontier no longer pose a threat to the homesteaders in Kansas, Nebraska and Wyoming. Grocery stores and dwellings for military members abound in all but the most remote areas of our country.³⁸

Confusion could cause us to vindicate our gross size by seeing or expecting threats and dangers as the stimuli demanding our response. There are threats and dangers, but they reside more in hostile will than in hostile means. Means are impotent without the will to employ them to some purpose. If we are disoriented and confused, what we may fail to see is the reality of a reflexive world wherein we might be the very stimulus that causes the response we subsequently categorize as threat or danger. In any case, whatever forces emerge in the future, in this country or elsewhere, should not be dependent on nuclear arms. It will be increasingly difficult for our country to assert the danger of weapons of

mass destruction while possessing, as we do today, great numbers of them. Would it not also be increasingly difficult for other countries to pursue or preserve theirs after we and our true friends have set most of ours aside?

The American people who sustain America's national security forces want security in return for the investment of their children and their taxes. At the acme of skill, this security arises not from subduing enemies by fighting but subduing them without fighting. Yet, sadly, we do not appear to be pursuing the acme of skill. Physics and medicine race ahead. "Quantum connectedness" theorizes that matter and energy may be organized by instantaneous connectedness or faster-than-light communications.³⁹ Medicine learns that the brain intervenes to regulate the health of the body, bolster the immune system, produce endorphins to fight pain or enhance performance.⁴⁰

Yet, the craft of war lags behind. Are we satisfied only to sift through these discoveries looking for novel, more efficient weapons and ways to kill and destroy? We choose to think and act this way, artless and unimaginative as it is. We might choose to overcome the limitations of today's weapons. Range and speed limited weapons in the past. Today space allows us to overcome the limitation of range, and cyberwar, electronic warfare and radio-electronic combat begin to change our understanding of weapons. The immediate challenge in physical weaponry, we think, is to operate at the speed of light. Yet, we already have some weapons that operate at the speed of light: images and information carried by fiber optics; the weapon of military *kanban* in the

We should consider the possibility that today our Armed Forces may be less "armed" than they are fat with unarmed housekeepers. . . . Fat can restrict the blood going to the neocortex, impede thinking and blur vision. Disorientation and confusion often result. Disorientation could lead to clinging to the past in the vain hope that size alone will allow the imposition of the past's structures on the present and the future.

information age.⁴¹ Warfare can evolve beyond the limitations imposed by physical weapons aimed at destruction and death.⁴² Neocortical warfare could be the result.

The poet-philosopher T. E. Hulme observed at the last *fin de siècle* that the end of one *Weltanschauung* and the beginning of another always seems to spawn "the unsystematic philosopher."⁴³ The celebration of a new millennium and a New Age has already begun for some. We suspect or even know that the future will transform our understanding of values, conflict, warfare and technology. Neocortical warfare—subduing adversaries without violence—is not only the warfare of the future, it is also the most demanding kind of warfare. It calls for the most imaginative and effective employment schemes. The soft *can* overcome the hard, as both Eastern wisdom and history tell us. A theory of neocortical warfare is out there somewhere, waiting for a more systematic philosopher to seize it. Perhaps that philosopher will read this. **MR**

NOTES

1. General Merrill A. McPeak, "Flexibility and Airpower," an address presented at the Air Mobility Command Dining In, 12 June 1993, in US, Department of the Air Force, *Air Force Update* (June 1993), 6. Emphasis added.

2. Will and Ariel Durant, *The Lessons of History* (New York: Simon and Schuster, 1968), 19.

3. *Ibid.*, 81–86.

4. Martin van Creveld, *The Transformation of War* (New York: The Free Press, 1991), 157. Van Creveld had the bad luck of having this book appear at the same time the war against Iraq began. Chapters 6 and 7 of this underappreciated book are magnificent.

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a5. John G. Stoessinger, *Why Nations Go to War* (New York: St. Martin's Press, 1985), 204-19.

6. Lee G. Bolman and Terrence E. Deal, *Reframing Organizations: Artistry, Choice, and Leadership* (San Francisco: Jossey-Bass Publishers, 1991), 225-29, 237-40, and Robert L. Morlan, *American Government: Policy and Process* (Boston: Houghton Mifflin Company, 1971), 2-3.

7. Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression* (New York: Oxford University Press, 1989), 14-17.

8. John A. Warden III, *The Air Campaign: Planning for Combat* (Washington DC: National Defense University Press, 1988). The challenges future campaign planners face are (1) to contrive plans that attack or engage living organisms and not just systems, and (2) to comprehend the impotence of dreadnoughts against "zodiac-boats." The "non-trinitarian" wars (van Creveld's descriptive term for those conflicts that do not evidence Clausewitz's "remarkable Trinity" of state, people and armed forces) or "Third Wave" wars of the future are radically different from the wars of the recent past. It may prove to be much easier to plan another violent campaign against Iraq, for example, than it is to plan one against the armed forces of a nonstate.

9. B. H. Liddell Hart, *Strategy*, 2d ed., rev. (London: Faber & Faber, Ltd., Signet Books, 1974), x, 325-30.

10. McPeak, "Flexibility and Airpower," 3. General McPeak does not assert that *Desert Storm* was the "last ancient war." He merely wonders whether it might have been or not. The "acme," in the opinion of some, would have been to prevent Saddam's aggression in the first place.

11. John R. Boyd, "A Discourse on Winning and Losing," August 1987. Boyd's analysis of strategy, tactics and the operational art led him to the discovery of the now famous "OODA loop." The loop—the cycle of observation, orientation, decision and action—led him to additional discoveries. One of the most important of these is the criticality of time in competition or conflict. Another, and equally important, analysis within the "discourse" is the nature of the fighting done by pirates, brigands, guerrillas and the essence of the counterinsurgency campaign.

12. Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990), 8.

13. Paul McLean discussed by Ned Hermann, *The Creative Brain* (Lake Lure, NC: Brain Books, 1988), 31.

14. Robert Ornstein and Richard F. Thompson, *The Amazing Brain* (Boston: Houghton Mifflin Company, 1984), 21-40, 133-71.

15. Hermann, *Creative Brain*, 32-39 and Ornstein and Thompson, *Amazing Brain*, 24-29, 38-39.

16. Robert E. Ornstein, *The Psychology of Consciousness*, 2d ed., (New York: Harcourt Brace Jovanovich, Inc., 1977), 20-39. See also Norman Geschwind, "Specializations of the Human Brain," in Rodolfo R. Linares, *The Workings of the Brain: Development, Memory, and Perception* (New York: W.H. Freeman and Company, 1990), 105-20.

17. F. S. C. Northrop, *The Meeting of East and West* (New York: The Macmillan Company, 1946), 407.

18. Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos: Man's New Dialogue with Nature* (Boulder: New Science Library, 1984), 171-76, 297-313.

19. Richard M. Restak, *The Mind* (New York: Bantam Books, 1988), 139-63. 20. Desmond Morris, *The Naked Ape: A Zoologist's Study of the Human Animal* (New York: McGraw-Hill Book Company, 1967), 173-85.

21. John Keegan *The Illustrated Face of Battle: A Study of Agincourt, Waterloo and the Somme* (New York: Viking Penguin, Inc., 1989), 285.

22. Van Creveld, *The Transformation of War*, 226. Let me explain the "sic": Conflict between humans may be natural, but mortal combat with weapons is not. It may be learned behavior. Some valuable martial behaviors are learned on the "playing fields" of games.

23. Arthur Pap, "Does Science Have Metaphysical Presuppositions?" *Readings in the Philosophy of Science*, editors Herbert Feigl and Mary Brodbeck (New York: Appleton-Century-Croft, Inc., 1953), 21-53.

24. Gary Zukav, *The Dancing Wu Li Masters: An Overview of the New Physics* (New York: William Morrow & Co., Inc., 1979; Bantam Books, 1980).

25. Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security* (Winter 1992-1993), 59-90.

26. Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the Twenty-first Century* (Boston: Little, Brown and Company, 1993). Also, see John Arquilla and David Ronfeldt, "Cyberwar is Coming!" *Comparative Strategy* (April-June 1993), 141-65. Cyberwar is here. Even so, I believe there are differences between theories of cyberwar and neocortical warfare. Neocortical warfare considers conflicts involving national security as warfare, thereby eradicating the gray area between peace and war and the distinctions that could separate today's armed forces from tomorrow's national security forces. It views subduing hostile will, or control over the adversary, as the aim of conflict, including warfare. Like cyberwar, neocortical warfare suggests that there are and always have been non-violent or less violent ways to establish control. Neocortical warfare asserts that controlling or subduing an adversary *without fighting*—because of its many advantages—ought to be the goal. In sum, cyberwar and cyberwar techniques such as propaganda, deception, illusion and concealment may be viewed as specific applications of the principles of neocortical warfare.

27. Boyd, "A Discourse on Winning and Losing," suggests that the way to win is to operate (that is, to observe, get oriented, decide and act) more quickly than an adversary. Ways to do this include depriving the adversary of essential information, overloading the adversary with puzzling or difficult to interpret information, using the adversary's "genetic heritage" or "cultural tradition" so that the enemy is self-disoriented or self-deceived, frustrating adversary actions, or denying the enemy feedback, or accurate feedback on the consequences of action taken. All of this is designed to "generate uncertainty, confusion, disorder, panic, chaos . . ." and "shatter cohesion, produce paralysis, and bring about collapse." Because the real province of conflict is the mind, all warfare is neocortical warfare.

28. Richard Bandler and John Grinder, *Frogs to Princes: Neuro Linguistic Programming* (Moab, Utah: Real People Press, 1979).

29. Dr. Armin Ludwig, "Economic Growth and Resource Competition as Threats to World Stability," a lecture presented at the Air War College, 15 September

1993. Using World Bank data, Professor Ludwig forecasts that by 2020 the world population will be 8.7 billion (today it is 5.5 billion) and the world gross domestic product will be \$58.5 trillion (today it is about \$25 trillion). As threats to stability, population is the "weak force" and resource consumption is the "strong force." He concluded his lecture by suggesting that by 2020, "international resource conflicts will be endemic." Used with Dr. Ludwig's permission.

30. Morris, *The Naked Ape*, 178.

31. Donella H. and Dennis L. Meadows, *Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*, 2d ed., (New York: Universe Books, Signet Books, 1974).

32. Samuel P. Huntington, "The Clash of Civilizations?" *Foreign Affairs* (Summer 1993), 22-49. See also "Responses to Samuel P. Huntington's 'The Clash of Civilizations?'" *Foreign Affairs* (September/October 1993), 2-26.

33. US Department of Defense, *The Bottom-Up Review: Forces for a New Era*, by Les Aspin (1 September 1993). The review postulates the need to preserve large conventional forces at least until 2000 in order to engage in two major regional contingencies "nearly simultaneously." If one accepts van Creveld's thesis, the bulk of these forces will have little military utility. If the essence of conflict resides in the "mind," then the principal purposes of such forces are as insurance against the failure of our own willpower or minds. One interpretation might be that, unwilling to shape events by a commitment to subduing enemies without fighting, we instead hope to fight them in familiar ways. See also John T. Correll, "Two at a Time," *Air Force Magazine* (September 1993), and Michael R. Gordon, "Military Plan Would Cut Forces But Have Them Ready for 2 Wars," *New York Times*, (September 1993), 1.

34. Eric Voegelin, "Extended Strategy: A New Technique for Dynamic Relations?" *Journal of Politics* (1940), 189-200. Few non-Germans appreciated Hitler's *Lebensraum* as the "biopolitical" manifestation of the racist views he derived from the pseudoscience of Ernst Haeckel. This linkage is defined and explored in George J. Stein, "Biological Science and the Roots of Nazism," *American Scientist* (January-February 1988), 50-58. Stein also shows that *Mein Kampf*, in specifying the German need for *Lebensraum*, clearly forecast war in Europe as Hitler's preferred solution.

35. Arquilla and Ronfeldt, "Cyberwar is Coming!" 160. In the future "exemplary use" will not be just selecting objects with high value—added as targets for attack or the application of physical force. More important, it will be the selection of the enemy mind—or the enemies minds—as the center or centers of gravity of hostile will.

36. US Department of the Navy, *Sonata*, by Vice Admiral Jerry O. Tuttle, 1993, 1. In the "Prelude," Tuttle proclaims the arrival of a "new kind of warfare, which we call Space and Electronic Warfare."

37. The "quality movement" can improve our ability to fight. For this to occur, we must find ways to make empowerment work within a military architecture. Leaders in the military today declare their commitment to empowerment, but many seem uncomfortable contemplating nonhierarchical organizational structures or the ways of operating that empowerment requires. In the opinion of some, such things as traditional scalar "wiring diagrams," senior officer reserved parking spaces in front of stores like the post exchange and commissary and a tendency to measure the same old things masked in the new lexicon of quality show the difficulty of making cultural changes. Authentic empowerment requires that we adopt different views and learn different behaviors. The result, however, could be the creation of national security forces so empowered that each individual is a cooperative center of gravity, a production unit of incredible influence, force, or lethality. Such a force would be difficult to subdue.

38. US Congress of the United States, Congressional Budget Office (CBO), *Military Family Housing in the United States*, a CBO Study (September 1993). According to the "summary" accompanying the report, the CBO calculates savings of as much as \$4.6 billion between 1994 and 1999 by providing less DOD housing and "relying more on cash housing allowances" that military families can use to obtain housing in the private sector. With the Census Bureau reporting that over 36 million Americans live in poverty and the electorate wanting a national health plan, like it or not, I expect our approach to military family housing will change to create more of a "peace dividend." Those changes will necessitate an evolution in our vision of bases, forts, posts and camps.

39. Zukav, *The Dancing Wu Li Masters: An Overview of the New Physics*, 301-2. There are many physicists who believe that the quest for quantum connectedness is as chimerical as the quest for a unified field theory.

40. US Army Research Institute for the Behavioral and Social Sciences, "Training Lessons Learned from Peak Performance Episodes," Technical Report 711, by J. L. Fobes, June 1986. This Army manuscript advocates teaching soldiers the "self-regulation of endorphin levels" or using competitive sports training "for endurance management (controlling fatigue and pain for sustained performance)." Imagine an elite force of troops, trained to be, among other things, endorphin (endogenous morphine and other opiates) self-regulators. Imagine these elite troops donning their chemical defense gear to protect themselves from adversary neocortical warriors—the limbic force—armed with naloxone, an endorphin inhibitor.

41. Taiichi Ohno and Setsuo Mito, *Just-In-Time for Today and Tomorrow* (Cambridge, MA: Productivity Press, 1988). *Kanban* is "just-in-time" information derived from the workplace. It also is no more or less than the information needed. To the "risk-averse," concepts of just-in-time and just-enough are as unsettling as conceptions of all-the-time and more-than-enough are comforting. See also Taiichi Ohno, *Toyota Production System: Beyond Large-Scale Production* (Cambridge, MA: Productivity Press, 1988).

42. Mark Tapscott and Kay Atwal, "New Weapons That Win Without Killing On DOD's Horizon," *Defense Electronics* (February 1993), 41-46. See also: David A. Fulghum, "ALCMs Given Nonlethal Role," *Aviation Week & Space Technology* (22 February 1993), 20-22; "Nonlethal Weapons Give Peacekeepers Flexibility," *Aviation Week & Space Technology* (7 December 1992), 50-51, and "Army Prepares for Non-Lethal Combat," *Aviation Week & Space Technology* (24 May 1993), 62-63.

43. T. E. Hulme, *Speculations*, edited by Herbert Read (London: Routledge and Kegan Paul, Ltd.), 25-26.

Future Foes, Future Fights

Colonel Gary B. Griffin, US Army

INNOVATIONS IN technology and doctrine are the harbingers of change in warfare. Dramatic developments in both of these areas have resulted in what has been described as a revolution in military affairs. Recent US military operations—*Just Cause*, *Desert Storm* and others—epitomize this revolution. They can be considered transition wars, exhibiting characteristics of both past and future conflicts. Coupled with dramatic advances in information and precision-guided munitions technology, these operations offer a glimpse of future conflict. An analysis of these operations reveals trends that aid in defining what future armies may look like, as well as what wars they will be called upon to fight. This brief article outlines trends in both areas—future land forces and the nature of early 21st-century conflict.

Future Land Forces

An analysis of trends in recent regional conflicts, weapons proliferation and security investments of nation-states and the armed forces of ethnic or politically motivated non nation-state actors, results in our being able to divide future land forces into three general categories—roughly equivalent to the waves of civilization described in Alvin and Heidi Tofflers' recent book *War and Anti-War*. The best means to describe the capabilities of these future forces is through explaining what they will look like, what they will fight with and how they will fight.

The most serious military threat confronting the United States in the first decades of the next century will be highly sophisticated armies of potential strategic competitors, some of which may be today's allies or recent antagonists.

The tactical nuclear threshold will likely be crossed before the year 2010. The impact will be strategic and will introduce an entirely new dynamic in war conducted regionally against neighboring nations or those involving outside global powers.

Classified as Third Wave forces, these armies will be relatively small by Cold War standards but far more lethal. Additionally, they will be highly trained and increasingly well led. Like their 18th-century counterparts, however, they will be exceedingly expensive to train, equip and maintain. Consequently, nation-states possessing these armies will be reluctant to put them in harm's way unless their vital strategic interests are at stake. They will seek to avoid conflict against equally capable armies where land force dominance cannot be assured.

Future armies of these highly developed nation-states will be industrial- and information-age hybrids. They will use surface and air-delivered precision-strike weapon systems extensively and employ highly sophisticated, survivable and mobile maneuver platforms—perhaps even wing-in-ground technology by 2030. For the most part, maneuver platforms will be similar to those seen today, albeit highly modified with communications and weapons capability improvements. Developments in long-range, precision-strike brilliant munitions may result in a redefinition of the classic relationship between fire and maneuver in advanced armies. Third Wave armies will also be equipped with nonlethal weapons, primarily, but

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not exclusively, for conducting operations in urban or otherwise constrained environments where collateral damage and noncombatant casualties are major political or military considerations. Future forces will rely upon automated systems in the execution of many battlefield functions, including low-level, indirect, sensor-triggered attacks, control of logistics and communication of routine battlefield information. The most critical systems employed by Third Wave armies will be those associated with information operations. Enhanced situational awareness will be the key to defeating larger opponents. Consequently, the establishment of spectrum supremacy will be a precondition for the operations of Third Wave armies. Simply stated, electronic warfare operations, designed to achieve spectrum supremacy, will prove as critical as conventional battlefield preparations and air superiority operations of past wars. In fact, the capability to successfully conduct information operations at all levels of war may deter or preclude the execution of conventional combat operations as we currently define them.

The most likely military threat will be forces of emerging strategic competitors—regional powers. The armies of these developing states, some Third World authoritarian, others “second” world nations with dynamic economies and ambitious strategic objectives driven by ideological or religious aggrandizement. These Second Wave land forces will remain relatively large but contain elite offensive components. Most of these elite forces will be indigenous; others may be made up of military professionals or units—mercenary soldiers or advisers—skilled in high-tech warfighting. Even so, these armies will be increasingly professional, far better trained and led than they are today. They will seek to avoid direct confrontation with Third Wave opponents, skirt world power conflicts and rely upon mass destruction weapons as a means of deterring involvement by more developed nations in their attempt to establish regional hegemony.

These armies will fight with a mix of old and new equipment. Elite formations may be equipped with systems—primarily combat—more modern than many of their potential Third

Wave adversaries. They will also possess arsenals of mass destruction weapons of all types. They will seek to employ high-tech operational and strategic defense systems, perhaps even space-based, to counter superior strike capabilities of global military powers. They will also

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possess, although in limited numbers, strategic and offensive weapons such as long-range bombers, missiles and submarines to threaten high-value military and political targets of regional competitors and Third Wave threats’ lines of communication. Preemptive attacks against highly visible targets will be sought as a means of discouraging outside power involvement. They will employ information operations systems, but will not be able to exploit them to the degree of more sophisticated powers. Heavy investment in these systems, especially in authoritarian regimes, will be prevented by the requirement to field conventional military hardware for domestic security and internal control.

Second Wave armies will remain, for the most part, force- versus effects-oriented. Consequently, they will fight with an attrition mindset. National doctrine, driven by a number of factors such as geography, regional threats and culture, are certain to emerge. As a result, the way these armies will fight will make them less predictable, let alone “templatable” in the sense of the Cold War intelligence preparation of the battlefield paradigm. These armies will also make great improvements in their combined



A US soldier peers up at the gaping hole blown through the roof of a hardened aircraft shelter by a laser-guided bomb during the Gulf War.

Third Wave war futurists describe battle between equally equipped and trained advanced armies as "cyberwar," the dynamics of which are yet to be understood. . . . Cyberwar will involve continuous, high-tempo, multidimensional, seamless, joint and, most often, multinational lethal and nonlethal military operations. They will be highly complex, politically and militarily.

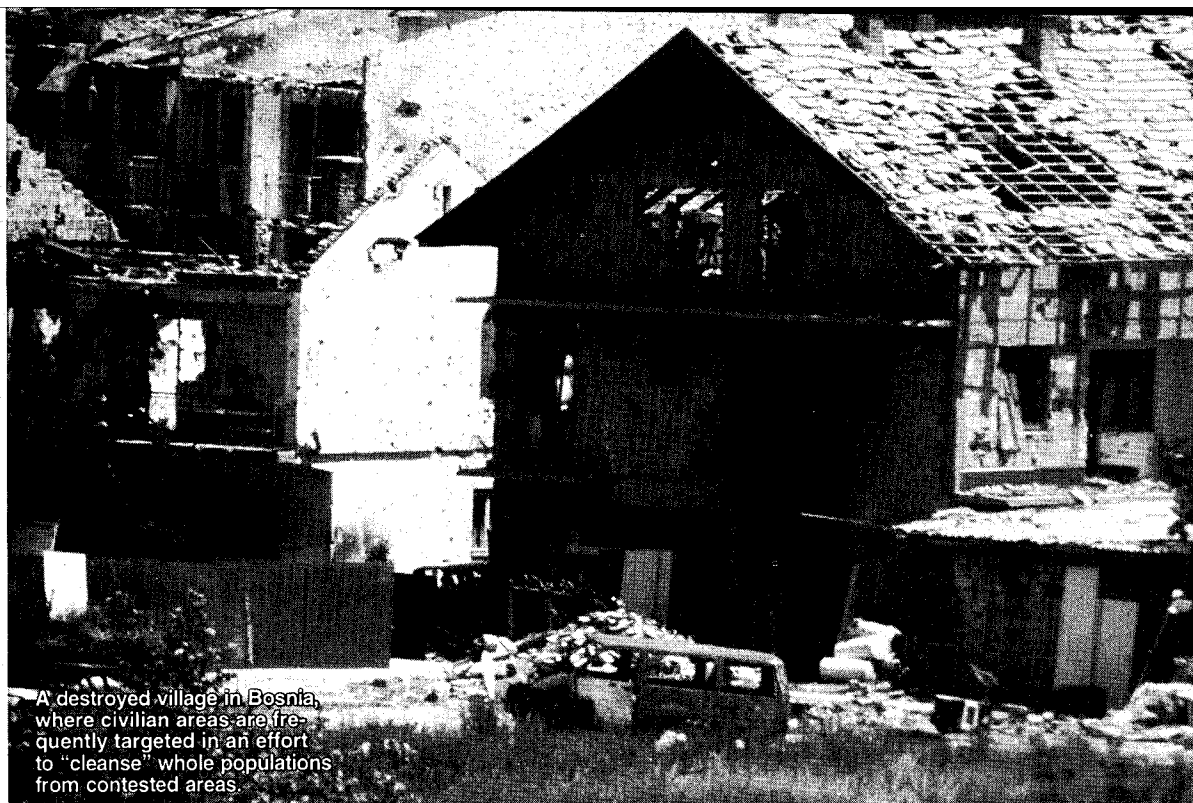
arms and joint warfighting capabilities. However, great improvements in the latter will not be possible in authoritarian states where extensive coordination between services represents a threat to the authority of the regime.

The most frequent military threat confronting land forces of developed or developing nations will be First Wave forces—among them non nation-state armies. Although the Tofflers classify First Wave as agrarian, these forces will by no means be "primitive," either militarily or

politically. In fact, their approach to operations will be quite developed, even elaborate. First Wave forces will consist of a mix of terrorist, paramilitary and, in many cases, conventional military forces. The possible existence of "rogue armies" of former nation-states cannot be excluded. In any case, these forces will be highly motivated and survival oriented. They will possess a complicated schizophrenic political-military character.

These First Wave forces will fight with a wide variety of weapons—from bolt-action rifles to smart mines and shoulder-fired antiaircraft missiles. They will employ information operations at the strategic level with great effect. High-tech commercial communications and locating systems will also be used. These forces will seek portable nuclear weapons and other mass destruction weapons, including biological and chemical. Sheer possession of these weapons will gain them global recognition and a seat at the international table—heretofore the privilege of nation-states alone.

Wave forces will employ decentralized command networks that prove difficult to identify, let alone interdict or neutralize. They will have nothing to lose by engaging in protracted warfare and, in fact, may seek that approach with conventional forces to capture world sympathy or display the irrelevance or weakness of conventional military power. Their operations will be a highly complex combination of political and military actions that, when viewed by other nations, may appear irrational—but they will not be. These forces will fight without convention or regard for diplomatic agreements and will be as ruthless as they are unpredictable. Seeking to control people, they will take their fighting to those areas where the world's population is moving—urban environments. At the lowest level of their operations—unconventional or limited military action—trying to identify these forces among the local populace will be like looking for a "needle in stacks of needles." Most of all, the leaders of these forces will be adept in manipulation of world opinion—expert at creating complex political, societal and military conditions that defy a conventional military resolution.



A destroyed village in Bosnia, where civilian areas are frequently targeted in an effort to "cleanse" whole populations from contested areas.

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Future Wars

It is clear that future wars will be far more variable and complex, even Byzantine, when compared with those of the past. A simple review of the developmental trends of future forces results in a near infinite number of possible future war scenarios—all equally plausible—capable of existing simultaneously in a single geographic region. Additionally, the revolution in military affairs has not developed to the point where we can predict, with any degree of certainty, what future war will look like. Like all revolutions the end result may be far different than envisioned at the outset. There is even debate within intellectual military circles that the fundamental Clausewitzian nature of war is undergoing change. Regardless, a general description of future war can be derived by looking at different combinations of forces belligerents may employ—again along the lines of the Tofflers' Third, Second and First Wave notions.

Third Wave war futurists describe battle between equally equipped and trained advanced armies as "cyberwar," the dynamics of which are yet to be understood. Due to their destructiveness, they will surely be more brief. They will be systems oriented rather than based on terrain or manpower "body count." The principle of mass will be redefined as the concentration of effects more than forces. Most of all, cyberwar will involve continuous, high-tempo, multidimensional, seamless, joint and, most often, multinational lethal and nonlethal military operations. They will be highly complex, politically and militarily, and involve the synergistic application of all elements of national and military power. They may also exhibit characteristics of 18th-century warfare—the era of decisive battle—albeit spatially extended in both time and space. For example, the capability to conduct multidimensional, seamless operations may lead to a redefinition of

[Regional powers] will fight with a mix of old and new equipment. Elite formations may be equipped with systems more modern than many of their potential Third Wave adversaries. . . . Second Wave armies will remain, for the most part, force- versus effects-oriented. Consequently, they will fight with an attrition mind-set. . . . The way these armies will fight will make them less predictable, let alone "templatable" in the sense of the Cold War intelligence preparation of the battlefield paradigm.

campaigns—operations involving primarily sequential military action.

Wars between Third and Second Wave belligerents will reflect many of the characteristics of *Desert Storm*. However, the primarily coalition armies of these regional powers will be far more capable. As a result of their analysis of current and near-term operations, they will seek to attack vulnerabilities of more sophisticated adversaries, also coalitions, whether it is through the use of information operations, preemptive strike to deter further escalation or attack of key lines of communication or areas previously assumed to be secure—operational and strategic staging areas.

Wars between Second Wave powers will resemble the Iran-Iraq war of the 1980s, with forces quickly depleting high-tech weapons stocks and exhausting elite formations. Conditions will quickly degenerate into "trench warfare" until stockpiles and training can be accomplished for the conduct of decisive offensive operations. There will, however, be one key difference, one designed to create, or forestall, the condition of

operational stalemate—employment of primarily tactical nuclear weapons. The tactical nuclear threshold will likely be crossed before the year 2010. The impact will be strategic and will introduce an entirely new dynamic in war conducted regionally against neighboring nations or those involving outside global powers.

Wars involving First Wave opponents will be far more frequent and diverse than other forms. They will prove equally challenging to global and regional powers. They will also be protracted and far more political than military in character. As mentioned, they will likely defy military solutions. The sheer number and variety of First Wave operations taking place today under the rubric of operations other than war are tremendous—Bosnia, Rwanda, Somalia, Gaza, Afghanistan and Northern Ireland to name a few. Once again, the threat or use of mass destruction weapons brings a new dimension to what has historically proved to be a Gordian Knot challenge for conventional military forces.

This article is a purely conjectural "think piece," based on linear trend analysis—a historically inaccurate means of assessing future conditions. But it does serve to explain, in part, the fundamental challenge facing the US Armed Forces and our traditional allies, especially their land components, which are expected to dominate land warfare—the historically decisive dimension of battle—under all conditions. Simply stated, the future presents us with multiple categories of both potential conflicts and adversaries—almost unlimited in number of combinations. Designing a land force with the flexible doctrine, relevant training, necessary materiel and, most of all, dynamic leaders and skilled soldiers essential for success is the greatest intellectual and practical challenge facing the United States since its emergence as a world power a century ago. **MR**

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Space and Power Projection

Commander Dale R. Hamon, US Navy, Retired, and
Lieutenant Colonel Walter G. Green III, US Air Force, Retired

RECENT EVENTS have demonstrated our success in a realm that readily combines technological superiority, highly trained personnel and joint operations into a valuable means to extend the power-projection capability of US Armed Forces—that realm is space. Our technological sophistication has opened space to a variety of uses that directly enhance our ability to globally project national power. The unique characteristics of the space environment offer the United States rapid access to otherwise denied areas of the world, and space systems can contribute to supporting multiple regional terrestrial operations in real time or near real time. The military use of space came of age during the Gulf War. As a result of the demonstrated value of space in that conflict, the nations already possessing space capabilities began actively pursuing improvements to their warfighting effectiveness. Nations without space assets began seeking to develop or obtain these force enhancers for their own use. The capabilities that space provides to the modern combat unit are available to anyone willing to buy these services from an increasing number of available competitors. This reality must not be dismissed, else we could find ourselves on the wrong end of space forces employment.

A new world order defines the strategic environment within which the United States pursues its national objectives. These enduring objectives are simple: ensuring survival of the United States as a free and independent nation; fostering a healthy and growing US economy; continuing cooperative relations with allies and

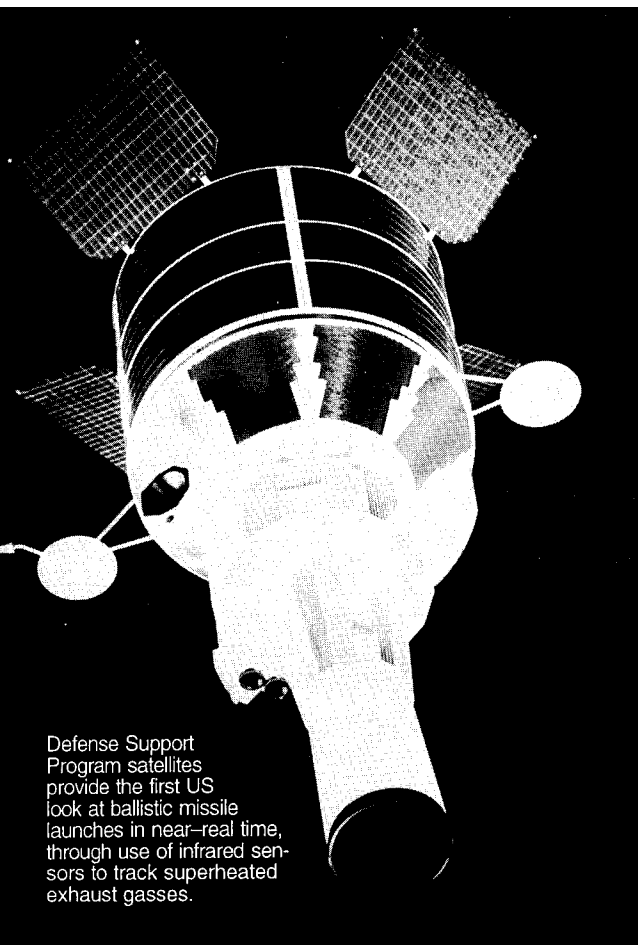
US national military strategy assigns four tasks to our Armed Forces. We must ensure strategic deterrence, exercise forward presence in critical regions, be able to respond decisively to crises anywhere and at any time and retain the capacity to reconstitute a larger force. . . . [Downsizing] constrains the power available to project into a crisis and stresses our ability to fulfill national objectives. Consequently, it is vital that [we] wisely use our limited assets.

friendly nations; and promoting a stable and secure world where political and economic freedom, human rights and democratic institutions flourish. Unfortunately, the instability of our modern world increasingly conflicts with these national objectives.

Today's conflicts are no longer bipolar. Instead, the dimensions of conflict are expanding, as economic chaos, nationalism, religious and ethnic disputes and historic rivalries dominate many regions. Future combatants will not be limited to Third World weapons. Rather, any US intervention will face an increasingly sophisticated arsenal. The proliferation of modern weapons reduces the opportunity for easy success in such unpredictable future wars.

Challenges Facing the US Military

The battlefield of the future will be uncertain—we do not know when the next war will start, what the threat axis will be, whom we will



Rapid and responsive military power projection demands timely and accurate reconnaissance, reliable weather monitoring, precise navigation, accurate maps and ample communication linkages for command and control. Growing requirements necessitate a wide variety of space systems that require continual performance improvements made possible by a robust space infrastructure. . . . Space is the high ground we must control.

face or what their capabilities will be. The emerging threat may well ignore traditional approaches to deterrence. At the same time, modern weapons provide even minor nations the capability to achieve political results far beyond the obvious potential of their forces. For example, militarily insignificant Iraqi Scud ballistic missiles were politically significant and socially frightening.

To meet these challenges, US national military strategy assigns four tasks to our Armed

Forces. We must ensure strategic deterrence, exercise forward presence in critical regions, be able to respond decisively to crises anywhere and at any time and retain the capacity to reconstitute a larger force if needed.

Implementing this strategy is complicated by the significant downsizing of our force structure. This constrains the power available to project into a crisis and stresses our ability to fulfill national objectives. Consequently, it is vital that our national leadership wisely use our limited assets to ensure success across the full spectrum of conflict.

An ambiguous threat and reduced force structure demand a more efficient means of projecting military power. We must significantly increase the combat effectiveness of our force structure through the synergism of capabilities that provide force multiplication. With the leverage this force multiplication provides, more capability is available to the theater commander to ensure mission success.

One means to achieve force multiplication is through technological superiority. For example, the widespread use of advanced munitions in Operation *Desert Storm* clearly demonstrated the return on US investment in high technology. Limited casualties and focused damage were the direct result. Another force multiplier is training—the high caliber of our All-Volunteer Force leverages combat power disproportionate to the numbers we bring to bear. The concept of joint operations is also proving to be an effective force multiplier. The synchronized use of diverse service capabilities during joint operations increases the overall effectiveness and significantly complicates an opponent's task. Space forces have repeatedly demonstrated force multiplication and are crucial to the achievement of US national security objectives.

Space Assets and Commanders

Given the availability of advanced weapon systems to potential opponents, extensive space capabilities are essential to the effective employment of US forces. Rapid and responsive military power projection demands timely and accurate reconnaissance, reliable weather monitoring,

1st Cavalry Division M2A2s and dismounts during the Gulf War.



Iraqi forces in the Gulf War were limited to known roads in their own country, while coalition forces freely roamed the featureless desert. Precise navigation supports other uses as well: minefield clearance, artillery fire support, assisting US forces in keeping out of each others' fields of fire, precision-guided munitions employment and covert missions. We need to deny this capability to our adversaries in future conflicts while maintaining the utility for ourselves, else we may find a crucial element of our force structure rendered ineffective, or even used against us.

precise navigation, accurate maps and ample communication linkages for command and control. Growing requirements necessitate a wide variety of space systems that require continual performance improvements made possible by a robust space infrastructure. The United States cannot afford to go to war today without full space support. Now, more than ever, space is the high ground we must control.

Space assets are available to US forces due to farsighted US leadership in the research and development of related technologies. We are able to use these sophisticated assets because our government had the wisdom and our industrial base had the resources to make the necessary investments in the future of space. Our forces need not look to foreign suppliers for critical space products, nor are we dependent on the world market to meet our space needs. It is important that the United States maintain its superior space capabilities.

Terrestrial Force Enhancement

Firmly embedded in the promise of space operations are distinct advantages afforded com-

manders in planning and conducting ground operations. Enhanced capabilities will be indispensable in the areas of reconnaissance, weather monitoring, navigation, mapping and charting and communications.

Reconnaissance. It is essential to success in any military operation that commanders know enemy force disposition, strength and the environment where combat will take place. Space-based reconnaissance elements allow global, timely operations not constrained by sovereignty concerns. The theater commander can enjoy real-time situational awareness in otherwise denied areas. Additionally, the commander must know of any changes within his area of operation to maximize force effectiveness during battle. Space assets provide this needed information to the theater with a level of detail that is useful from joint task force headquarters down to the foxhole. Satellites are available to support battlefield preparation, enemy force assessment, targeting, weapons cuing and battle damage assessment. We now need to provide this wealth of information to the operators as soon as they need it, without undue security limitations, and

in a form best suited to their need and level of operations.

Weather monitoring. Weather-observation assets used by military forecasters literally reduce the fog of war by identifying and monitoring weather phenomena. In many situations, earth-sensing satellites provide the only means

Space-based reconnaissance elements allow global, timely operations not constrained by sovereignty concerns. The theater commander can enjoy real-time situational awareness in otherwise denied areas. . . . Space assets provide this needed information to the theater with a level of detail that is useful from joint task force headquarters down to the foxhole.

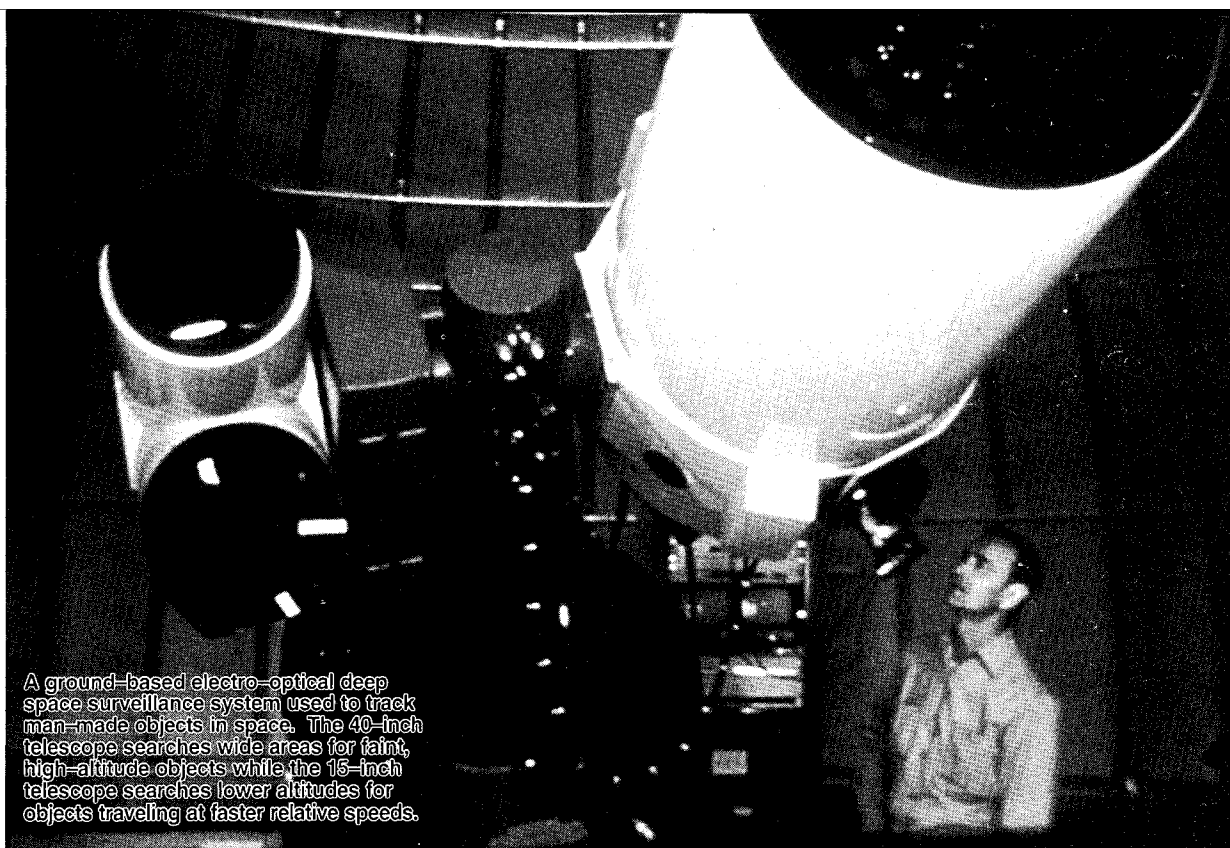
of assessing field conditions in support of mission planning before the commitment of forces. During the Gulf War, the Department of Defense (DOD) and commercial meteorological satellite systems were the principal means of acquiring reliable weather data over Iraq. This information was used to determine how best to configure in-theater reconnaissance assets, which precision-guided munitions to employ and when and where a unique-capability force should strike. Also, it would have helped predict movement of chemical or biological agents had they been used by the enemy. The critical data provided by space-based meteorological systems makes our advanced weapon systems more effective and gives commanders the freedom to exploit the weather as a component of decisive action.

Navigation. Timely, accurate and three-dimensional navigation information from space on a common, worldwide grid reference system solves the age-old problem of the field commander knowing where he is and where he is going. The Global Positioning System satellite constellation enables US forces to maneuver using all-weather, day-night accurate positioning, navigation, timing and velocity data. Iraqi

forces in the Gulf War were limited to known roads in their own country, while coalition forces freely roamed the featureless desert. Precise navigation supports other uses as well: minefield clearance, artillery fire support, assisting US forces in keeping out of each others' fields of fire, precision-guided munitions employment and covert missions. We need to deny this capability to our adversaries in future conflicts while maintaining the utility for ourselves, else we may find a crucial element of our force structure rendered ineffective, or even used against us.

Mapping and charting. Earth resource satellites provide the information needed to develop current maps of almost any region in the world to a degree previously unobtainable. For example, maps of Kuwait were over 30 years old and required immediate replacement; space systems allowed us to respond to this need before *Desert Storm* began. However, the US system is limited, and we had to purchase additional images from France to fulfill warfighter requirements. In addition to maps, these resources allowed theater commanders to plan amphibious and airborne operations, track the movement of Iraqi forces and prepare for and practice strike operations. As foreign and domestic satellites are upgraded with extensive multispectral imaging capabilities, they will provide improved and more timely mapping and charting products tailored to the forces they support. It is essential that the United States ensure its lead in this crucial technology to avoid dependence on foreign sources.

Communications. Commanders require real-time, assured connectivity to deployed forces to execute battle plans. One of the lessons of *Desert Storm* was that in-theater communications systems were unable to meet commanders' needs because a modern communications infrastructure was simply not available. However, satellite communications systems have the capacity to handle large volumes of traffic accurately and on time. In the Gulf War, over 90 percent of US communications requirements into, out of and within the theater were supported by military and commercial communications satellites. These links were not targeted by enemy jamming—we



A ground-based electro-optical deep space surveillance system used to track man-made objects in space. The 40-inch telescope searches wide areas for faint, high-altitude objects while the 15-inch telescope searches lower altitudes for objects traveling at faster relative speeds.

A theater commander must know when an adversary's space system threatens his operations and be able to decide on an appropriate response. The current network uses ground-based sensors deployed throughout the world. In the future, we need to field less vulnerable space-based systems to reduce the possibility of foreign interference.

must not expect similar freedom of action in future conflicts. Essential satellite communications capabilities must be available regardless of the level of conflict. This will require a survivable, on-orbit communications network with multiple data links, to include electromagnetic protection. For maximum benefit to our forces, small tactical terminals need to be deployed to link individual units with overhead networks. By using capabilities of both military and commercial satellite communications systems, US forces will be provided connectivity where and when needed.

Ballistic Missile Warning and Defense

It is unlikely the United States and Russia (the Ukraine or China) will fight a nuclear war in the foreseeable future. However, high-tech weapons of all types are available in increasingly alarming quantities in the international marketplace. Proliferation of chemical, biological and

nuclear weapons, as well as modern long-range delivery systems constitutes a grave threat to US security interests. Small countries can now arm themselves with weapons of mass destruction. By the turn of the century, well over 30 nations may possess nuclear, chemical and/or biological weapons. Many of them, particularly in the Middle East, are actively shopping for missiles and other delivery systems to extend the reach of their new arsenals.

Warning. The space-based ballistic missile warning function includes sensors that provide timely, worldwide detection, identification, tracking and attack assessment of both strategic and tactical missiles. Space warning assets provide a much larger warning and intercept envelope than ground-based radars, enabling the theater commander to take effective action earlier. In *Desert Storm*, the experiences of the infrared sensors of the Defense Support Program showed a shortfall in capability against the modern

theater ballistic missile with a short burn time.

Defense. In addition to responsive warning, a ballistic missile defense system is required to provide protection against intentional, accidental or unauthorized ballistic missile launches. A layered defense of both ground- and space-based systems needs to be developed and deployed. Our initial capability, as demonstrated in the Gulf War, is the Patriot system. Patriot

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Rendering hostile space systems ineffective ensures greater freedom of action for our terrestrial and space forces. Today the United States has no such capability. . . . This shortfall severely limits the range of options available to national decision makers in times of crises.

provided a limited, ground-based point defense and was assisted by space-based assets with launch information and impact point prediction. The next step is to add longer range weapons, specifically designed to counter theater ballistic missiles and provide protection for larger areas. Larger, more capable, ground-based ballistic missile defense systems are required for limited protection of the United States against the larger intercontinental and submarine-launched ballistic missiles. The long-term goal is to add a space-based defensive layer that will extend the coverage umbrella to anywhere in the world with its capability of destroying attacking missiles in the boost, post-boost and midcourse phases.

Space-based warning and responsive defense

systems will allow our forces to engage the threat while it is still over the launching country and return the intercepted debris to its originators. A high probability of a successful defense will significantly impact the decision to use such weapons and greatly reduce their potential political leverage. Once a credible, effective defense has been demonstrated and fielded, the United States will be able to discourage nations from acquiring and stockpiling weapons of mass destruction and their delivery means.

Control of the Space Realm

The first step in controlling space is knowing what needs to be controlled. Space surveillance focuses on detecting, tracking and identifying all man-made objects and events in space. A theater commander must know when an adversary's space system threatens his operations and be able to decide on an appropriate response. The current network uses ground-based sensors deployed throughout the world. In the future, we need to field less vulnerable space-based systems to reduce the possibility of foreign interference. Using these resources, the friendly and hostile space orders of battle can be provided to the commander in time to take action to minimize the effectiveness of an enemy space system.

The second component of space control is negation of enemy space systems. Rendering hostile space systems ineffective ensures greater freedom of action for our terrestrial and space forces. Today the United States has no such capability against satellite systems or antisatellite systems, limiting counterspace operations to attacks against the terrestrial infrastructure. This shortfall severely limits the range of options available to national decision makers in times of crises. The United States needs a full-featured set of systems able to neutralize enemy space capabilities while protecting ours. These features include soft kills such as jamming, deception and interference and hard kills that disable or destroy space systems.

Launch. As more space capabilities are integrated into combat operations and training, a reliable and effective launch infrastructure to put

HARNESSING TECHNOLOGY

satellites into the proper orbits becomes more critical. In light of rising international competition, the need for cheaper launch operations is even more acute. The congruence of DOD needs for responsive launch and commercial interests in a competitive low-cost launch service demands improvements in our decaying launch infrastructure and the development of new lift vehicles. Current heavy- and light-lift vehicle needs are well met by in-place systems, but these constitute only 18 percent of our requirements. Our supply of medium-lift capacity is sorely lacking, and space employment rests on our nonresponsive, high-cost and decaying launch infrastructure. With a civil, commercial and defense partnership, the United States can operate an affordable and internationally competitive space-lift capability that meets the needs of our nation.

Satellite control. Control mechanisms for telemetry, tracking and commanding our satellite constellations are evolving as an integrated satellite control network. This will reduce duplication of effort and accompanying costs, link all control systems to ensure continuity of operations during crises and provide necessary satellite mobility to support theater operations. Ultimately, the ability to task a satellite and receive vital mission data will move into the theater of operations for direct support systems.

Space is fundamental to implementing a national strategy calling for global commitment; military power projection in regional crises; rapid response under conditions of uncertainty

and instability; high mobility with minimized forward presence; and maximum efficiency in achieving operational goals.

The space vantage point provides our forces information necessary for the planning and execution of military operations. In helping to prepare the battlefield, space systems characterize the terrain, weather conditions and disposition of enemy forces. As the crisis develops, space forces assist decisive force employment at critical points. The ability to detect and react to changes on the battlefield more rapidly than an opponent greatly enhances the combat effectiveness of US forces.

Space systems will always be first on the scene. Although silent and unseen, these systems continuously and reliably support soldiers, sailors, Marines and airmen deployed around the world. Because of the growing dependence of our forces on space-based capabilities, we must continue to take the necessary steps to ensure the requirements of the warfighting commanders are fulfilled by the space systems we field. Further, military space initiatives must be closely coupled to civil and commercial efforts to ensure all receive the benefits of advanced technology investments while increasing our national competitiveness in the world market. Only with a focused, integrated approach to space will we be able to operate superior space forces.

Space uniquely provides the US forces essential capabilities that will mean the difference between mission failure and mission success. **MR**

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Decision Support Technology

Lieutenant Colonel Michael L. McGinnis, US Army, and
Major George F. Stone III, US Army

FOR MILITARY commanders at all levels, making decisions in war or in peacetime has always been a highly individualized, complex process. Important decisions are often based on obscure, partial information to ensure that adequate time is available to communicate orders and carry out the action. The problem today is not a lack of information, but rather that the amount of information available to both commanders and staffs has become overwhelming. What is needed is an information system, designed especially for commanders, to aid in managing battle information in a way that fits how commanders actually assess situations and issue orders in combat. Although the development of such systems, in general, has been and will likely continue to be oriented toward either the strategic or tactical level of command and control (C²), the effects of such systems will invariably impact all levels of war: strategic, operational and tactical.

At present, the military complex is in transition where the traditional roles, missions and force structure of each military service branch is being reevaluated and redefined. This period of change should be seen as an opportunity to step forward and embrace 21st-century technology in an effort to meet the information needs of future commanders. This article focuses on the application and potential benefits of transferring two types of information technology developed for corporate executives and their staffs—namely executive support systems (ESS) and group support systems (GSS)—to tactical and nontactical military environments.

Managing Military Information

The highly individualized, fragmented nature of command makes it difficult to define the commander's information requirements or to develop a framework for managing the information feeding the C² process. This is partly due to the expanding dimensions of what is considered the C² domain. Science, engineering and human factors continue to stretch the horizons of C². This is reflected in how the command and control acronym has changed over time from C² to C³ (plus communication), to C³I (plus intelligence), to C⁴I (plus computers), to possibly C⁴I² (plus information management). Not until the domain matures and the art and science of C² are brought closer together will it be possible to develop an acceptable set of first principles essential to a unifying theory for C². One source of help for bridging this gap may be the appropriate application of emerging information technology to the C² process.

Retired Lieutenant General Wilson A. Shoffner, former Combined Arms Command and Fort Leavenworth commander, clearly motivated the need to define the role of information in the C² process and the need for a dynamic framework to manage C² information. Shoffner stated that, "Decision making requires relevant, timely, and accurate information. Not only do we need to know what information is required to support the commander's decisions, but we must also know who will provide what information and when the information will be provided. That's only one piece of the equation. We then need to know how to translate this information

into decisions, orders, and actions. Commanders can't wait for perfect information before making a decision. . . . Decisions must be decisive and based on 'about right' information."¹

Information management problems for commanders and staffs raised by Shoffner include coping with information overload, representing both hard and soft information, determining the value of information, making critical information available to commanders "just-in-time" for them to make important decisions and finding ways to format information so it is easily understood by all. In seeking solutions to these problems, it has been helpful to research related information management problems encountered by corporate executives and their staffs.

From ESS to Commander's Support System

Over the past decade, the emergence of corporate computer-based ESS has made a significant impact on executive work in information management, decision making, planning and control and mental modeling.² ESS has broadened the executive's span of control, making it possible to flatten organizational hierarchy. It has also reduced staffing levels through office automation, sped up decision-making cycles and made organizations more flexible in responding to change.³

Also under development are computer tools for ESS to help executives with mental modeling, a complex, highly intuitive process where corporate executives envision how their firms might function in future operating environments.⁴ Mental modeling by corporate executives is similar to mental war gaming by tactical commanders, whereby commanders test the phased synchronization of military forces and activities in time and space to defeat the enemy in battle.⁵ This area offers opportunities to develop tools for enhancing commander's insight in dictating the tempo and ultimate outcome of battle. Potential research areas include:

- 2-D and 3-D computer-digitized representation of the battlefield with zoom-in capability for enhanced resolution.

[Group technology] has tremendous potential for improving C² of military forces participating in coalition warfare, where foreign languages form a significant barrier to clear, rapid communication of information, plans and orders. . . . Equipping C² centers with automatic voice and text language translation capability will likely reduce the need for human interpreters, thus contributing to seamless C² of coalition forces in training or in warfare.

- Graphical options for overlaying the computerized battle area with tactical control features, unit locations and other battlefield information.

- Color-coding standard unit icons to reflect unit status in areas of critical interest to the commander, such as personnel, ammunition, weapons, communications and vehicles.

- Information drill-down capability that gives commanders and staffs immediate access to more detailed information on specific combat units using either voice-activation technology via a visor heads-up display with minicamera technology, or by "pointing to" or "touching" unit icons graphically displayed on a laptop or notebook-type computer.

- Tracking units or critical issues over time using "hot" colors or triggers.

- Development of decision support systems (DSS) to aid commanders and staffs with course of action analysis using expert systems, computer graphics, spreadsheets and faster-than-real-time combat simulations.

- Development of computer software to speed up and standardize report generation such as operations orders, fragmentary orders and unit status reports.⁶

From GSS to a Military Staff Support System

In preparing for battle, military commanders spend substantial amounts of time in meetings with staffs, brainstorming and analyzing

alternate courses of action. As mentioned above, enormous amounts of information can be made available on the disposition of both friendly and

Realization of a just-in-time information delivery system for commanders will require complete horizontal and vertical integration of a joint information management system. . . . The most formidable challenge in implementing a joint, interoperable ComSS may be overcoming resistance by each service branch.

enemy forces. Anytime staffs become overloaded by information, the chance that critical information is overlooked increases. One new information technology that may help military staffs in dealing with information overload is GSS, which is designed to support collaborative group work across a number of different group processes with tools specially tailored to increase group performance and productivity. Documented use of GSS in corporate and academic environments shows technology-supported groups are more productive than unsupported groups.⁷

For example, studies at IBM reveal that GSS produced a higher quality product in less than half the time required by groups working without group technology.⁸ It is reasonable to expect similar benefits from the application of group support technology to military staff work in both tactical and nontactical environments. The timesaving feature of group support technology makes it especially attractive to commanders and staffs at all levels, given the inherent need to deal with a broad range of complex issues in a timely manner during the preparation and execution of battle plans.

One group support system used by a number of government agencies is GroupSystems, developed at the University of Arizona. GroupSystems tools support group work in five areas: planning and management of working sessions; managing group interaction; establishing and

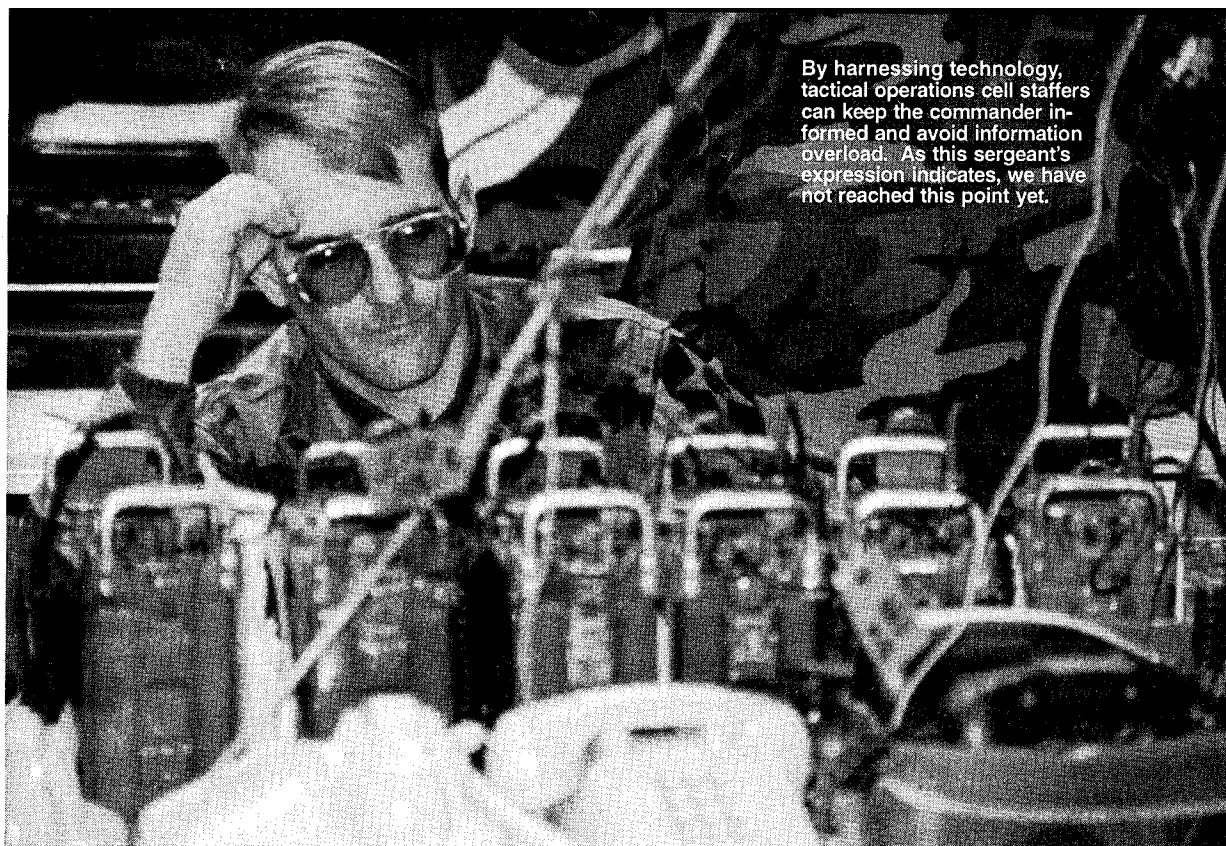
maintaining organizational or group memory; supporting individual work within the group; and collecting, storing and retrieving information.⁹ Figure 1 identifies GroupSystems tools and the group activities supported.

These tools can be applied to improve the efficiency and productivity of military staffs, task forces or other working groups in a variety of ways. For example, GSS combines group memory technology with integrated voice, text and visual media to support same-place or distributed meetings in either synchronous or asynchronous environments.¹¹ This feature makes group technology well suited to support commanders and staffs operating in joint environments, where combat forces and other resources may be located thousands of miles apart and spread across several different time zones.

In recent years, researchers have begun to

GroupSystems Tools	Group Activities Supported
Electronic Brainstorming	Idea exploration, generation and organization
Topic Commentator	Idea exploration and generation
Group Outliner	Idea exploration, generation and organization
Idea Organizer	Idea exploration, generation and organization
Categorizer	Idea exploration, generation and organization
Group Writer	Idea exploration, generation and organization
Survey	Idea exploration, generation and organization
Group Dictionary	Information management
Vote Selection	Prioritizing ideas
Alternative Evaluator	Prioritizing ideas
Group Questionnaire	Prioritizing ideas
Group Matrix	Prioritizing ideas
Stakeholder Identification	Policy development and evaluation
Policy Formulation	Policy development and evaluation

Figure 1. GroupSystems VTM Tools¹⁰



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focus on international applications of group technology featuring *real-time language translation capability*. This feature has tremendous potential for improving C² of military forces participating in coalition warfare, where foreign languages form a significant barrier to clear, rapid communication of information, plans and orders. With further research and development, it may become possible to automatically translate digitally transmitted messages between allied command centers from the sender's language to the receiver's language, thereby enhancing communication, coordination and execution of joint, combined and coalition operations. Equipping C² centers with automatic voice and text language translation capability will likely reduce the need for human interpreters, thus contributing to seamless C² of coalition forces in training or in warfare.

Military Application of ESS and GSS Technology

Other government agencies are currently making practical use of group support technology as well. For example, the Army Research Laboratory (ARL) at the Georgia Institute of Technology infuses group technology into different decision-making environments by providing meeting facilitators and GSS technology to support high-level group meetings. ARL doctors James Gantt and Mike Evans have facilitated several general officer working group meetings (sponsored by the Louisiana Maneuvers Task Force from Fort Monroe, Virginia), using a portable GroupSystems, where general officer participants address Army problems of the 21st century. In April 1993, ARL facilitated the National Performance Review, sponsored by Vice President Al Gore, which focused on

initiatives for reinventing government from an information technology point of view.

Tactical applications of information technology are also being investigated. One such initiative undertaken by the US Army Training

The Battle Command Battle Lab (BCBL) . . . is studying the impact of emerging information technology on weapon systems, C², communications, intelligence and information systems. BCBL is also exploring ways to improve the commander's situational awareness, leading to more effective control of operational tempo through information technology.

and Doctrine Command (TRADOC) has established six battle laboratories to improve the force modernization process and examine how our soldiers will be organized, trained and equipped in years to come.¹² The laboratories also serve as research centers to study battlefield functions, warfighting doctrine, emerging technology and human factors across the combined arms force.

The Battle Command Battle Lab (BCBL) at Fort Leavenworth, Kansas, is studying the impact of emerging information technology on weapon systems, C², communications, intelligence and information systems. BCBL is also exploring ways to improve the commander's situational awareness, leading to more effective control of operational tempo through information technology.¹³

One source of help with these initiatives is being provided by the Operations Research Center at the US Military Academy, West Point, New York, and by Army officers enrolled in the Industrial Engineering and Systems Management doctoral program at the University of Central Florida. These efforts are being funded by the US Army Artificial Intelligence Center, Washington, D.C., and jointly sponsored by the TRADOC Research Analysis Center (executive sponsor) at Fort Leavenworth and the BCBL

(operating sponsor). The primary focus of this research is to identify and apply new information technology to C² that aids and improves how commanders acquire, process and use battlefield information. The deliverable is a prototype command support system (ComSS), centered around a dynamic system model for managing the information needs of Army commanders at battalion, brigade and division levels. The system will include a suite of supporting tools and a modular development of system interfaces as illustrated in Figure 2.

Once prototyped, the system will be tested, evaluated and modified using distributed interactive simulation (DIS).¹⁴ Eventually, DIS nodes will connect the battle labs, field units and research centers, enabling commanders and staffs to test battlefield dynamics using the type and volume of information generated when forces are actually deployed in combat, while they interactively participate in simulated tactical exercises with virtual, real and semiautomated forces. Through this process, the information needed by commanders and staffs to support training, course of action analysis and command decision making can be identified. Feedback from structured, interactive sessions with commanders and staffs linked through DIS technology will make it possible to define system requirements so the ComSS can be tailored

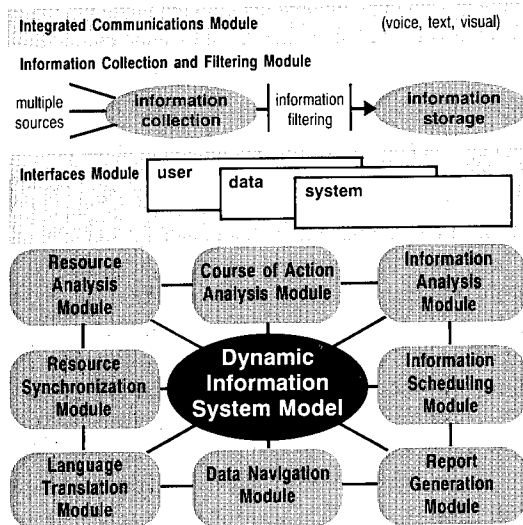


Figure 2. Modular approach to ComSS development

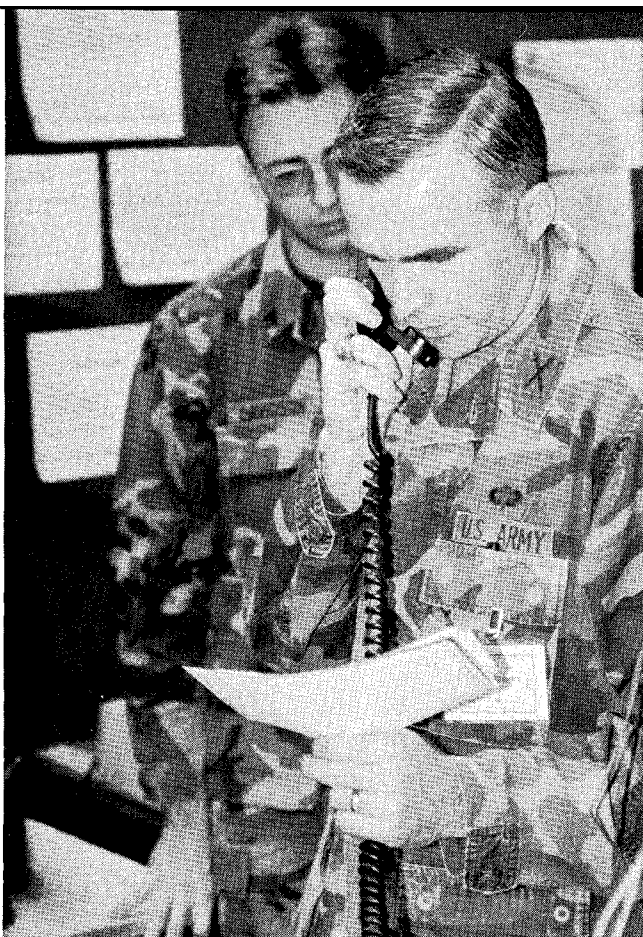
to fit the information needs of commanders rather than forcing commanders to conform their decision-making styles to available technology. If the system tests successfully in simulated tactical environments, it can be integrated with tactical C² processes. Although initially oriented toward Army commanders and staffs, the modular design and prototyping approach ensures flexibility for adapting the system to meet the information needs of commanders from other services as well. The hope is that this work, combined with the efforts of others, will contribute toward development of a seamless ComSS, integrated horizontally and vertically across all branches of service, which manages information in a way that enhances decision making in both training and tactical environments.

Challenges to Developing a Joint, Interoperable ComSS

There are three main requirements of an information system to support commanders: It must be flexible enough to be individually tailored to meet the information needs of different commanders by functional area, level of command and branch of service; it must make information available to the commander when needed; and information must be formatted so it is easy to understand. A properly designed information support system, tailored to these needs, can make more time available for commanders to focus on what is important and give them immediate access to crucial information. Although there are worthwhile incentives for attempting to develop a ComSS, there are significant challenges as well.

Realization of a just-in-time information delivery system for commanders will require complete horizontal and vertical integration of a joint information management system. Because all services have made enormous investments in existing C² systems, the most formidable challenge in implementing a joint, interoperable ComSS may be overcoming resistance by each service branch.

The ComSS must account for different information needs of commanders by level of command and by battlefield functional area. For



Feedback from structured, interactive sessions with commanders and staffs linked through DIS technology will make it possible to define system requirements so the ComSS can be tailored to fit the information needs of commanders rather than forcing commanders to conform their decision-making styles to available technology.

example, higher level commanders and staffs might favor a system that provides insight into long-term, strategic impacts of decisions. On the other hand, lower level commanders might argue that information which supports a high-level, long-term view of the battlefield, while useful, would not be sufficiently detailed to help them make decisions about specific tactical operations. Even though system design must account for the unique needs of all users, it must also conform to a common set of standards for communications equipment, computer hardware, software, system protocols and data and

Information management must be built-in from two perspectives: that of system users and system managers. . .

With numerous sources sending vast amounts of information across multiple communication channels, the challenge to commanders trying to make the best decision possible is timely access to accurate information.

information representation to develop a joint C² system that is truly interoperable.¹⁵

Successful implementation of a joint ComSS also requires a significant commitment to applied research to develop the tools necessary to support the system. Research is needed in automatic text and information-filtering services; artificial intelligence; knowledge-based expert systems; neural nets; developing object-oriented, relational data bases using hypercard and hypertext technology; and data issues, such as protocols for exchanging, updating, editing and deleting data, data base navigation, security, standards for assigning value to data, and standards or methods for measuring bias, credibility, completeness and accuracy of data.¹⁶

Information management must be built-in from two perspectives: that of system users (commanders, staffs and others) and system managers. Future battles will be fought at a faster tempo with weapon systems that have greater ranges, are more accurate and can respond faster to requests for fire support. With numerous sources

sending vast amounts of information across multiple communication channels, the challenge to commanders trying to make the best decision possible is timely access to accurate information. If system design does not explicitly account for information management requirements, the information system will be quickly stretched beyond its capabilities in tactical situations. Once this occurs, the ComSS will most likely fail to meet the information needs of users, causing it to immediately fall into disuse as commanders and staffs turn to other information sources.

In the past, force structure focused primarily on how to best configure sustainable sets of weapon systems to deliver superior firepower at the right time and place to win the battle. In the future, force structure may need to be designed around integrated intelligence, communication and information systems that support the flow of crucial information to commanders. Combining state-of-the-art information technology with battle lab and DIS initiatives will contribute toward developing an information system that meets the unique needs of military commanders in future battles.

Now is the time for the military to realize the benefits from emerging information technology, such as ESS and GSS, by transferring this technology to both tactical C² and nontactical military decision-making environments. Arguably, developing a seamless, jointly interoperable C² system may offset, to some degree, the combat capability lost as our military force structure is downsized, making the remaining forces more effective through improved C². **MR**

NOTES

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divisions would ensure that these units had sufficient combat power to defend themselves until the equipment and operators arrived. Infantry soldiers are not tied to the vehicle, which gives them the flexibility and combat power to act independently. Divisions are already loading troops and equipment for deployment simultaneously.

Third, I agree that dismounted infantry must train with the vehicles if they are going to replace crew casualties and do other mounted tasks. These tasks should be added to a unit's mission—essential task list. However, there is more to being an infantryman than riding in the back of a vehicle. The crew for the vehicle trains on gunnery and maintenance in a mechanized unit. Many of these units are so undermanned that the dismounted element of the squad contains only one or two soldiers. The leadership is concerned with the operation of its main weapon system—the vehicle. The dismounts are an afterthought.

The duplicate chain of command is really not a problem because the mechanized regiment will have duplicate equipment. A mechanized squad will consist of two vehicles, two crews of three men each and a squad leader. The light squad will provide a fire team to each vehicle. The light company and mechanized company will be task organized to form two mechanized infantry companies. The equipment already exists for this plan since the Army drew down from 11 heavy divisions to eight. The structural manpower savings will be in the dismounts because they will not be part of the mechanized modification table of organization and equipment. The dismounts will come from the infantry regiment.

Fourth, I maintain that a much smaller CONUS-based Army must have the flexibility to respond to

multiple contingencies and does not have the luxury of having just four divisions for a Gulf War scenario and four other divisions for a Vietnam War scenario. As was shown in Somalia, Haiti and Florida, the 10th Mountain Division cannot do it alone without relief. There must be the flexibility to send elements from the 1st Infantry Division or 2d Armored Division to some of these contingencies, or morale and eventually combat readiness will suffer.

Although many who have considered this concept believe it is too radical, their business-as-usual approach to reorganizing the Army after the draw-down is not the answer. While the forward-deployed units in Korea or Europe, which are already task organized for combat, should probably not change, units in CONUS, both Active and Reserve Components, should be organized as I suggest. A good place to test this concept might be at Fort Lewis, Washington, where the 9th Infantry Regiment and the 3d Brigade, 1st Armored Division, could be organized into a regimentalized division.

Finally, given the briefings by the US Army Total Army Personnel Command that the future infantry officer being considered for battalion command may have as little as 54 months with troops, it may be time to consider formal specialization in either a light or mechanized track or the creation of a new branch such as cavalry for mechanized officers. This would help focus officers on the technical aspects of their branch in the reduced time that is allotted to the troops to learn the trade. This is apart from the requirement for all combat arms officers to be tactically proficient and able to synchronize and integrate the battlefield operating systems on the modern battlefield.

While the Army may not adopt these changes, the continued reduction of our current structure may result in a hollow, less-capable force. The concept of regimentalized divisions will give the Army a greater capability than the status quo reduction.

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Intellectual Leap Into Yesteryear

I read Colonel Charles D. McFetridge's article, "In Pursuit: Montgomery After El Alamein" (June 1994 *Military Review*), with great interest. As a young infantry officer, I spent two years in North Africa where I had an opportunity to study the terrain and to follow the campaign routes of the protagonists. I also had an opportunity to meet some participants and hear their views. With this background, I would like to make a few comments on the article.

It is often difficult in the 1990s to visualize the actual conditions that existed over 50 years ago. We are so familiar with the sophisticated technology and the capabilities of modern equipment that we frequently fail to appreciate the battle conditions of the time.

Even in 1962, the coast road so vital to movement there was only a single-lane road of dubious quality. In 1942, it must have been little better than a pot-holed, hard track, scarcely capable of sustaining the heavy traffic requirements of the British Eighth Army. Vehicles were not as reliable as today's equipment; tanks had limited track life and mechanical reliability. Tank transporters were few and unreliable.

Movement during the war was much slower than today. For cars on open roads, 40 miles per hour (mph) was fast. Convoys might average 10 mph in good conditions, with movement in the pursuit even slower. Off-road movement of tracks was very slow. Even in 1962, with good weather, I expected to average 10 mph. In wet weather, I might only move 10 miles a day—and I had no enemy to fight. Away from the tracks, movement was worse. The ground was rocky and boulder-strewn, with roads cutting deep ravines.

Last, the reputation of the North Africa port of Tobruk as a harbor belies its capability. It is small and

without any facilities except those provided by nature.

McFetridge also criticizes the failure of the British Eighth Army to seize the initiative. The battle lasted 10 grueling days. None of us today has fought this sort of battle. One needs little imagination to realize the necessity to take some stock before relaunching, especially against an opponent of formidable reputation. The battle had also exhausted many resources accumulated for the campaign. This depletion was throughout the long supply line that stretched back to the Suez Canal and, from there, by way of the Cape of South Africa to England and Australia.

McFetridge rightly compares the rapidity of Field Marshal Erwin Rommel's retreat with Sir Bernard L. Montgomery's follow-up. One should remember, however, Rommel had less to move and, to a certain extent, could choose when to move. Montgomery had to ensure that, whatever happened, he sustained no military setback. It is worth recalling that he was following a path passed twice before by that army in the two preceding years. In each previous case, the Germans turned the tables successfully. McFetridge should not assume that British Eighth Army intelligence on the state of the Axis forces was as good as his is in 1994.

My last point is that the British Eighth Army was a coalition. Recent events remind us of the difficulties of coalition warfare. In the case of the British Eighth Army, the other Allies—Australia and New Zealand—had vivid memories of the wasteful loss of life during World War I on Gallipoli Peninsula in Turkey, which had been attributed to inadequate care for British Empire lives by British leaders. Montgomery could not afford any such repeated criticism.

I would caution one against assessing a campaign without making the intellectual leap that puts one into the conditions of the time. Writing from the comfortable sophistication of our homes and offices about events that took place 50 years ago can lead to an unjust distortion of the capabilities and intentions of the participants of those campaigns.

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Executive Guide to Information Technology

The US Army Information Systems Engineering Command has published an *Executive Guide to Information Technology* (catalog number PB94-196151). The guide is for nontechnical senior executives developing information systems compatible with the emerging Department of Defense information infrastructure, as major renovation of the Pentagon continues. For a free copy of the guide, write to National Technical Information Service, NTIS 5285, Port Royal Road, Springfield, VA 22161, or call (703) 487-4650. For rush service, call 1-800-553-NTIS.

^{MR}World War II Almanac



Incident at Nis: Consequences of the US-Soviet Clash in Yugoslavia

James F. Burke

In a little known engagement during the final year of World War II, US and Soviet forces inadvertently fought each other in a fierce battle that left more than 40 American and Soviet soldiers dead. The resulting exchanges between senior military officials in Moscow and Washington, D.C., offer insight into the origins of the Cold War, Soviet political ambitions in Yugoslavia and Poland and Soviet views of US military and political ambitions in Eastern Europe.

On 7 November 1944, 27 US P-38 fighters of the Fifteenth Air Force in Italy were patrolling deep over Yugoslav territory. They had been ordered to strafe retreating German troops on the road from Novi Pazar to Kaska in eastern Yugoslavia. At 1250, they shot up a column from the Soviet XI Guards Rifle Corps, reportedly destroying 20 vehicles and killing the corps commander, Lieutenant General G. P. Kovtov, and 31 other Soviet troops. The column was traveling near the towns of Nis and Aleksinac, located midway between Sofia and Belgrade on the main road between the two capitals. The Red Army units involved were attached to the Third Ukrainian Front, which was then involved in a multipronged assault into Yugoslavia involving Soviet, Bulgarian and Yugoslav forces (the latter controlled by Marshal Josip Broz Tito's Yugoslav People's Liberation Army). The column was located approximately 50 kilometers behind Soviet lines.

Although Soviet ground forces had immediately recognized the unique aircraft as American in design and insignia, they did call for air support when fired upon. Soviet officials claim that nine Soviet aircraft were then sent to intercept the group. The ensuing air battle led to the downing of two, and possibly three, Soviet aircraft (killing two pilots) and the reported death of four civilians near the Nis airport. The Soviets claimed that the US aircraft stopped their attack only after a "Captain Koldunov" risked his life by flying under the flight leader to show his markings.

Soviet claims about when the aircraft were attacked by the P-38s have varied over time. In the initial letter of protest to the US government, Soviet officials stated quite clearly that Soviet aircraft were shot down while trying to gain altitude after taking

off from an airport near Nis. However, in an official history of the war edited by General S. M. Shtemenko, Soviet officials claimed that the aircraft were shot down in a dogfight with US aircraft well after they had reached their desired altitude.¹ This doctored version also erroneously claimed that three US aircraft were shot down.

Major General John R. Deane has written that a US Joint Chiefs of Staff (JCS) investigation found that only two Russian aircraft were shot down after they downed two US aircraft flying at treetop altitude.² The obvious difference between US and Soviet accounts is that the Soviet one was intended to justify initial Soviet claims of US deceit and the heroism of Soviet pilots while facing US attack. The entry for Kovtov in the 1983 edition of the *Military Encyclopedic Dictionary*, published by the Soviet Ministry of Defense, fails to mention that he was killed by US aircraft, perhaps to keep from besmirching his name.³

The Soviet State Defense Committee and the Soviet Army General Staff sent a note of protest to the US Military Mission in Moscow on 7 November 1944.⁴ In it, the Soviet Army General Staff first demanded that the officers involved be punished. Second, it pointed out that US planes were not supposed to be flying within the Soviet zone of operation—the Balkans—without prior approval of the Soviet Army General Staff. Finally, the staff noted that US planes should not have been in the area anyway since the Soviets had previously informed the US Military Mission in Moscow between 14 and 16 October 1944 that the Soviets had captured Nis and the surrounding area.

The US Military Mission officer in charge was Deane, who, on his own initiative, responded to the Soviet protest of 7 November 1944 by proposing the creation of a bomb line and an exchange of liaison officers between field headquarters. He informed the JCS of the protest in a communiqué dated 10 November 1944.⁵ The JCS, in turn, brought the issue up with the president's Soviet Protocol Committee, headed by Brigadier General John Y. York Jr., and the Combined Chiefs of Staff.

The JCS never disputed that a flight of US aircraft was conducting strategic interdiction of German forces, which were then retreating toward US and British forces in northern Italy. Nor did the JCS ever dispute Soviet claims about the air engagement, even after an investigative team looked into the matter. Instead, the JCS sent an immediate letter of apology to the Soviet Army General Staff expressing "their deep regret."⁶

They also proposed revival of the idea of a bomb line forward of advancing Soviet troops, one that would be designed to prevent a recurrence of similar attacks. The JCS defined their proposed bomb line as follows:

"A bomb line may be defined as an imaginary line on the ground established by Army field commanders setting forth the forward boundary of an area in front of their ground forces in which the attack of ground targets by friendly aircraft is prohibited. This line must be delineated by terrain features easily recognizable to pilots in the air at all altitudes. It should be close enough to advancing troops to permit the attack of all vital strategic air objectives and tactical targets, air attacks which will materially assist in the advance of ground troops or are necessary to the success of a strategic bomber offensive in carrying the war to the enemy. It should not be construed as a boundary for restricting movement of friendly aircraft."⁷

By reviving the bomb line concept, the JCS raised sensitive political and military issues for the Soviet Army General Staff and Soviet State Defense Committee. When Deane discussed the idea with his contact at the Soviet Army General Staff—Lieutenant General N. V. Slavin—he discovered that the Soviets were angry not just at the incident at Nis, but also at US support for noncommunist guerrilla movements throughout Eastern Europe.⁸ The Soviets were also concerned by the fact that the clash at Nis followed just weeks after an incident in the Far East involving a US strafing attack on a ship controlled by the border guards, which postwar Soviet sources claimed occurred in September 1944, although no Soviet protest resulted.⁹

Deane recounted in a message to the JCS that Slavin had informed him that the Soviet State Defense Committee would establish a bomb line, but that it would not be close to the forward edge of battle area as the JCS and Deane had originally proposed. Instead, the Soviets demanded that the bomb line be established at the edge of the "operational zone" of Soviet forces, which they put at a line from north Köslin through Poznan to Breslau to the intersection of the Austrian, Hungarian and Yugoslav borders (a point midway between Zagreb and Sarajevo—Visegrad—Sjenica) and, from this point, to the Alba-

nian border. The Allied Air Forces Headquarters in Caserta deemed this line to be "untenable" and argued that "to allow this bomb line to stand for the strategic forces would seriously reduce the total air effort to be brought to bear on the retreating enemy."¹⁰

The British Chiefs of Staff also opposed having any bomb line north of Vienna, because it would have limited Allied support for the Polish Home Army (formed by the Polish government-in-exile in Poland). The Polish Home Army had recently turned to fighting the Soviets after Stalin created a competing government in Lublin and then had Soviet forces stop less than a mile from the center of Warsaw to watch German forces destroy the Polish Home Army-sponsored uprising from August to October 1944.

Slavin informed Deane that US and British aircraft should not be operating in Eastern Europe—period. This point had been made clear to Deane after an effort earlier in the year to coordinate air operations. Coordination broke down after Deane proposed a joint press statement mentioning the fact that the "Red Army has penetrated the borders of Poland"—territory that Stalin planned to annex.¹¹ Deane has argued that the primary reason the Soviets proposed a bomb line that would have kept Allied forces out of Eastern Europe was to prevent the delivery of supplies to noncommunist resistance forces and the Polish Home Army in the region. Indeed, an internal JCS study on the issue stated that the United States was then providing arms to the Polish Home Army.¹²

Rather than press the Soviets further to establish a bomb line close to advancing Soviet forces, the Combined Chiefs of Staff decided on 22 November 1944 to let the issue drop and unilaterally impose the original US bomb line south of Vienna effective 3 December 1944.¹³ They coupled that order to Allied Air Forces Headquarters throughout Europe with a new initiative authorizing Deane to discuss the possibility of setting up liaison missions between field commanders (that is, the Allied Air Forces Headquarters at Caserta and Soviet *front* commands).¹⁴ However, before the plan was implemented, the JCS rescinded the bomb line order in favor of talks with the Soviets on establishing field liaison missions.

When Deane mentioned the Combined Chiefs of Staff alternative proposal for field liaison officers to Slavin, he discovered that the Soviet official had no authority to negotiate such an arrangement. After much delay, Deane was allowed to meet with the head of the Operations Department of the Soviet Army General Staff, Lieutenant General A. I. Antonov, who also demurred that he had no authority to authorize such a move.



P-38s strafe and drop fragmentation bombs on positions dominating a mountain pass.

In one curious incident during the meeting, Antonov expressed shock when Deane informed him that he did not understand Soviet intransigence since the United States already had a two-man team in Bucharest coordinating air operations with General of the Army R. I. Malinovsky's staff in the Second Ukrainian *Front*.¹⁵ Apparently, the two-man team from William J. Donovan's Office of Strategic Services (OSS) had been sent to the region without the approval of the Soviet Army General Staff. According to Deane, they were there to look for US prisoners of war, although rumors about what they were doing have focused on intelligence collection on the Soviet occupation of the Balkans.

The Soviet Army General Staff would never have approved such a mission since it was not eager to have US military or intelligence officers on the ground anywhere in Eastern Europe. The only Western officials that were supposed to be in the region were closely watched representatives to the Allied Control Commission located in Sofia (the US Military Mission did not arrive in Sofia until 14 November 1944). Both the two-man OSS team and British officers attached to the Allied Control Commission attended Kovtov's funeral in Sofia. They reported that local commanders, unlike the officers in Moscow, were quite understanding and regretted the unfortunate incident.

Despite sincere apologies and efforts by the US and Soviet staffs to coordinate air actions, Soviet officials remained intransigent. They were busy establishing pro-Soviet regimes throughout the Balkans and did not want to give the Western Allies an

opportunity to gain intelligence on Soviet activities or possibly establish contacts with resistance forces. Soviet officials did not even agree to a Western proposal to seek prior Soviet approval for air operations within 200 miles of the Red Army's front lines until March 1945. Even though the proposal had first been broached at the Yalta Conference, rather than cooperate to speed up the end of the war, the Soviet Army General Staff presented every obstacle possible and even ordered field commanders to take defensive measures whenever any planes approached. This set an unfortunate precedent for Soviet responses to intrusions by Western aircraft that would have disastrous consequences for dozens of Western aircrews and hundreds of civilians during the Cold War.

The US attack on Soviet forces at Nis could not have come at a worse time for US-Soviet relations, when the leaders of both countries were concerned about what the postwar arrangement in Europe would bring. Soviet suspicions of Western intentions had already been growing after reports of negotiations between a *Waffen SS* field commander in Italy and the Western powers, and Western military aid for the Polish Home Army reached Stalin.

The attack at Nis may have inadvertently signaled to Stalin that the West might resist a Soviet advance into Central Europe. Moreover, Stalin may have believed the attack was connected in some fashion to a Western gambit for control of western Yugoslavia (Slovenia, Bosnia and Croatia). Indeed, British and Yugoslav troops, with Soviet support, would soon clash over control of the city of Trieste.

The incident at Nis is not only a fitting example of the nexus between military operations and political objectives in war, but also a lesson for field commanders who may let subordinates get away with sloppy preparation of operations. The incident should not be considered as merely an example of the fog of war, but a lesson in how mistaken actions at the tactical level can have strategic and political repercussions. Precision in the conduct of tactical operations is a matter of military and political necessity. *MR*

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November 1944

Combat Studies Institute, USACGSC

Wednesday 1—British forces launch an attack on Walcheren Island in the Netherlands, seizing a bridgehead in bad weather.

German forces continue their evacuation of Greece, while Allied forces begin to distribute supplies in the Athens area.

Thursday 2—The British 52d Division captures the Flushing seaport on Walcheren Island.

In the Philippines, units of the US Sixth Army on Leyte Island seize Carigara and Baybay.

Friday 3—Japanese forces launch the first of their explosive balloons against the west coasts of Canada and the United States. Of 9,300 hydrogen-filled balloons, only 285 reach North America.

The 3d Canadian Division succeeds in closing the Breskens pocket in the Netherlands.

Saturday 4—Slowed by rain, the Soviet 2d Ukrainian Front seizes Cegled and Szolnok, near Budapest, Hungary.

The British I Corps captures Geertruidenberg along the Maas estuary. British minesweepers begin operating near the port of Antwerp, Belgium.

Monday 6—President Franklin D. Roosevelt wins a fourth term, defeating Thomas Dewey in 36 of the US states.

In Burma, the Chinese 22d Division approaches Shwedaung after crossing the Irrawaddy River.

Tuesday 7—In Tokyo, the Japanese execute Richard Sorge, a Soviet spy.

On Leyte, the US X Corps launches its attack against Ormoc.

Wednesday 8—General George S. Patton Jr.'s US Third Army launches an offensive near Metz, France, which is aimed at reaching the Saar River.

The Canadian First Army completes the conquest of Walcheren Island.

Thursday 9—Units of the US Third Army cross the Moselle River at several locations near Metz.

In Italy, the British 4th Division captures Forlì.

Friday 10—The Japanese offensive in China seizes the US airfields at Liuchow and Kweilin.

Saturday 11—Off the coast of Leyte, the US Navy's Task Force 38 finds and attacks a Japanese relief convoy, sinking five transports carrying some 10,000 soldiers.

Sunday 12—In Norway's Tromsøfiord, Royal Air Force (RAF) Lancaster bombers drop three 12,000-pound bombs on the German battleship *Tirpitz*.

Allied forces finally clear the islands at the mouth of the Scheldt River that had blocked the ship route to Antwerp.

Monday 13—In southern Yugoslavia, German forces evacuate Skoplje.

Tuesday 14—The French First Army launches a major attack to seize the Belfort Gap in France.

Wednesday 15—North of New Guinea, a combined US Navy and Royal Navy task force attacks Mapia Island. Forces of the US 31st Division overcome the small Japanese garrison.

Thursday 16—In preparation for a 12th Army Group offensive, some 2,800 US and RAF aircraft

drop more than 10,000 tons of bombs in and around Aachen, Germany.

Friday 17—Along the Western Front, the French First and US First, Third, Seventh and Ninth armies continue their offensives in the face of deteriorating weather and increased German resistance.

Allied governments' representatives request Belgian resistance forces cease operations.

Saturday 18—On the Western Front, units of the US Third Army reach Metz, while the French First Army breaks through the Belfort Gap.

On the Eastern Front, forces of the Soviet Leningrad Front launch a new offensive against Saaremaa Island in the Baltics.

Sunday 19—On the Western Front, the French 5th Armored Division reaches the Rhine River near Rosenau, while US Third Army troops enter Metz.

Allied troops continue their offensive in Burma, with Indian forces seizing a bridgehead across the Chindwin River.

Monday 20—Allied forces on the Western Front run into increased German resistance, particularly in the Huertgen Forest.

Carrier aircraft from the Royal Navy launch attacks against Japanese airfields and oil installations on Sumatra Island.

Tuesday 21—Albanian guerrillas capture Tirana and Durazzo, Albania.

Wednesday 22—On the Western Front, the US Third Army completes the capture of Metz. The French First Army repels several German counterattacks and seizes Mulhouse, France.

Thursday 23—The Canadian Parliament votes to send 16,000 draftees to replace combat losses. Before this date, only volunteers served in the Canadian army.

In Italy, the British Eighth Army establishes bridgeheads over the Cosina River.

Friday 24—On the Eastern Front, Soviet forces complete the conquest of Saaremaa Island. The German navy evacuates some 5,000 of its defenders.

US B-29s begin bombing attacks against Japan from bases on Saipan.

Saturday 25—Japanese kamikaze aircraft attack Allied ships in the Leyte Gulf, hitting the aircraft carriers *Cabot*, *Hancock*, *Intrepid* and *Essex*.

A German V-2 rocket strikes a Woolworth store in south London, killing 164 persons and wounding many more.

Sunday 26—Heinrich Himmler orders the Auschwitz crematoria destroyed.

Soviet troops capture Michaloyce, Czechoslovakia.

Monday 27—The Allies finally open the port of Antwerp, greatly assisting the logistic support of the armies.

Chiang Kai-shek prohibits the supply of US munitions to Chinese communist forces.

Tuesday 28—On the Eastern Front, Soviet forces capture Mohács and Pécs, Hungary.

Wednesday 29—In the Leyte Gulf, kamikaze attacks damage the battleship *Maryland* and two destroyers.

On the Eastern Front, Soviet forces cross the Danube River near the Hungarian-Yugoslavian border and, farther north, secure northern Finland.

Thursday 30—Chiang Kai-shek orders two Chinese infantry divisions to return to China from Burma.

On the Eastern Front, the 2d Ukrainian Front launches a new offensive into northern Hungary.

MR Insights

Information for Battle Command

W. B. Cunningham and M. M. Taylor

There are fundamental principles of information that support battle command and information operations in terms that commanders can understand and execute. The principles described here apply to any current or future force design. They provide the basis for decisions the US Army must make to successfully execute contingency missions at both the tactical and operational levels of war.

Information has always been important, but the pace and scope of modern operations have turned information into a critical commodity that requires

the same level of command attention as traditional combat resources. Commanders must develop a more formal understanding of information, their information needs and the consequences for their command. Each commander must strike a balance between too much and too little information, recognizing that there will be errors of omission and commission and costs associated with each.

The commander must have a principal information agent over whom he exercises battle command exactly as with maneuver subordinates who act as

his agents in their domains. He needs to make his intent clear, not in terms of the old commander's critical information requirements (CCIR), but in terms of the decisions he expects to make and the informational needs expressed here. He needs eyeball contact to ensure this is understood and that he understands the information agent's plan to carry out the intent down one more echelon in that process. Subagents who respond to the primary information agent also need to understand the commander's intent and their support role. This establishes minimal error with respect to the commander's objectives. The commander must establish his intent for information, just as with any other resource. The principal difference is that many information sources or transport means may lie outside his direct control. This is a change from taking information for granted.

Joint Publication (Pub) 1-02, *DOD (Department of Defense) Dictionary of Military and Associated Terms*, defines information as the meaning that a human assigns to data by means of the known conventions used in their representation. Formally, *information reduces uncertainty in the decision space of the recipient*. The change in uncertainty is what distinguishes information from mere data. The distinction has several important implications:

- The information must be relevant to the decision problem of the recipient. This applies to both the information content and its timeliness. Information received too late to influence a decision is not relevant.
- The information must reduce uncertainty in the decision space, reducing or eliminating ambiguity created by disparate or conflicting data.
- While command decisions at the top of a hierarchy receive the most attention, many supporting decisions are made almost continuously throughout the command.

Thus, the information pertinent to each decision must flow from other parts of the hierarchy to the many decision modes. Information flows top-to-bottom, bottom-to-top and laterally. Organization, prioritization and maintenance of information flow for both command and supporting decisions is a command responsibility.

An individual's decisions and actions are directed toward changing the future. Specifically, they are directed at changing the current perception of the world into some desired perception, where the desired perception may include both the immediate and distant future. Information is required to support perception of the present, to project the future and to track progress along the way. Five perceptual modes have been identified that give rise to the

information needs discussed below.

Information for intent. This establishes a subordinate's understanding of the superior's intent at the highest and most pervasive level of abstraction and with the least possible uncertainty or error. Information for intent also establishes a basis for relevance essential for converting subsequent data into usable information. The perceived intent is almost never the result of a single one-way transmission. Multiple exchanges occur until both parties are satisfied that the error rate is acceptable. A low error rate in the exchange is a value both parties must share. This two-way information exchange is so critical to all subsequent actions that a major part of battle command is devoted to its success.

Control information. This addresses matters of primary and current attention for which the individual will take immediate corrective action if the perceived situation is not as desired. Control has a very specific meaning in this sense (most closely related to the NATO definition in Joint Pub 1-02). Commanders or their supporting authorities must receive control information frequently enough to reconstruct a continuous and unambiguous estimate for those matters currently under control and to maintain a good assessment of the situation for those matters for which control is desired. Control information is similar to CCIR, except exactly which information is critical for control is a dynamic that mirrors the attention of the recipient. Individuals can actively control few matters at any instant. The art of battle command includes judicious time-sharing of immediate attention and control, then shifting attention when appropriate or necessary. Matters not under immediate control can be monitored with far less attention and information.

Monitoring information. This addresses matters an individual is not currently controlling but which he may choose to control at any moment. While monitored variables stay within tolerable bounds, the commander will not attempt to affect them. However, if they move into areas of danger or opportunity, the commander will shift them to the category of "controlled perception" described above.

The information rate for monitoring any given topic varies considerably. At the upper bound, the rate is the same as for control—although the monitoring is passive. However, the total information rate may be very high because many more variables are monitored at any instant than are controlled. Monitored variables should be simplified into variables requiring low information rates until control is required or desired. Careful management of information rates for overall monitoring offers the greatest opportunity for improving organizational efficiency.

Monitoring is similar to routine information, except for highly variable data rates and the potential for switch to control. Commander's guidance on monitoring and alerting information requirements should amplify standing operating procedures that are too static for the pace of battle envisioned.

Alerting information. This permits a commander to ignore vast amounts of information until it becomes important enough to demand attention. Almost all the information available within a command at any moment from sensors or reports is irrelevant to those matters the commander is currently controlling or monitoring. If a commander's model of the environment is sufficiently stable, preset alerting criteria are established, and no information on that topic is passed to the commander until the criteria are met.

The command and control system should employ most of the passive alerting pattern detectors operating in parallel. An alerting detector's job, whether machine or human, is to keep watch for a preset pattern and provide a signal that a given topic or situation requires immediate attention to deal with either danger or opportunity. The average overall data rate to the commander remains intentionally very low, but the peak information rate of an actual alert is very high. However, the total data rates to the various alerting detectors must be extremely high. It is a massive parallel or distributed processing requirement, arguing for domain-specific alert detection as close to information sources as possible to cut down the transport problem.

Multiple-domain pattern detection requires data transport to central nodes that should be located to ease the transport requirement. These nodes may be relatively fixed or aligned with data transport nodes, since the alert patterns are predetermined. Post-detection alerting information is critical information. Commanders can greatly simplify their information requirements and supporting infrastructure by properly defining alerting requirements, particularly if the centralized monitoring function can be converted to decentralized alerting. Commanders must establish a balance between missed alerts and false alerts.

Sought information. This provides specific information to clarify perception and reduce ambiguity. This is usually because the available information is not adequate or current data are in conflict. The actual search is usually carried out by a subordinate and corresponds to "information pull." Each inquiry is usually quite specific, but widely disparate data may have to be combined to satisfy the request, which would not have been made if the answer were available in the first place. The vol-

ume of data is not especially high, but the short-term information rate may be high if the inquiry is urgent. Searching is most common during planning but may occur during execution, where a decision may be deferred until the ambiguity is resolved. This condition is urgent, especially if control information is missing and is the object of the search.

Exploration. This is a generic term to describe probing the world to "see what is there and how it reacts." It always involves action, the results of which are perceived by the commander and used to enhance or update the world model on which projections and decisions are based. Exploration is normally done when all the capacity for controlling is not in use. It involves control of probing agents while redirecting sensors and report sources and modifying guidance for processing. Exploration is a potent form of learning that requires a flexible information system. Reconnaissance and opposed exercises are forms of exploring.

Collaboration. Collaboration, or lateral information flow, is also essential for organizational success. The information needs can be identified from the above discussion, with the caveat that one person's information is another's data, and vice versa. A peer's intent provides useful input in formulation of one's own intent. The principle of unity of command shows that two commanders should not require controlling information about the same thing, although one may monitor another's control. Lateral transfer of monitoring or alerting information is important, but the recipient must consider carefully whether the rate of externally generated information is sufficient to support control, as discussed above. It is purely a matter of sufficiency for control, not ownership of the information sources.

Information overload. This may take several forms, most of which are manageable by technology or procedure. Most frequently, information overload is really data overload caused by improper filtering, abstraction or both. When this occurs, the burden of rejecting or converting useless data falls directly on the user, who has progressively less time to deal with it in an urgent situation. There are two general strategies for managing the problem: knowing and filtering for data of immediate importance (that is, distinguishing control information from all else); and appropriate aggregating and abstracting of data to exactly match the current problem. Monitoring and alerting employ both strategies to reduce extraneous data and the number of activities controlled at any instant. Attempts to control too many activities at one time may produce multiple overload problems.

Editor's Note: This paper results from informal collaboration between the US Army Training and Doctrine Command and the Canadian Defence and Civil Institute of Environmental Medicine (DCIEM Report 94-53), and represents the opinions of the authors. The fundamentals described herein are based on known principles of information theory and perception control theory as applied to goal-seeking organizations, most specifically to battle command of military forces. Each point raised is subject to considerable expansion, in terms of both its scientific underpinning and its application. Questions or comments can be directed via e-mail to the authors: 'cunningb@monroe-emhl.army.mil' and 'mmt@ben.dciem.dnd-ca'. **MR**

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A New Way to See Terrain

Lieutenant Colonel Clark K. Ray, US Army

An armor company commander receives a message telling him to expect a meeting engagement with an enemy tank battalion approaching from the northeast during the next 20 kilometers (km) of his advance. The advanced data sharing capabilities of his M1A2 Abrams tanks provide an accurate picture of the disposition of his unit. But where should he direct his forces to influence the coming battle to his advantage?

Knowing the relative strengths of his vehicles, he wants to identify a series of positions that will allow him to engage at a range of 3 km. It would be even better if he could determine locations where direct fire visibility diminished at around 2 km. Then, if the engagement is not going to his liking, he could break contact unobserved. How can he identify positions with such specific visibility characteristics in the few minutes he has to plan his course of action?

A tired brigade commander and his staff prepare for the climactic engagement of their National Training Center (NTC) rotation. As has happened to many units before them, the reconnaissance battle is not going well. Reports are coming in that units of the opposing forces (OPFOR) moving to the attack are avoiding the engagement areas he and his staff had so painstakingly selected. His last chance to shape the battlefield is to deploy his limited allocation of scatterable mines.

Properly placed, they might channel the OPFOR advance into seemingly innocuous zones that would maximize the ability of his redeployed reserve to engage at favorable ranges. But how can he determine those zones in the short time available to make and execute a decision? Considering the prospects for a hurried analysis by a tired staff using grease

pencils and acetate, the commander opts for yet another seat-of-the-pants decision. . . .

A haggard signal officer yearns for the old days of exercises conducted in familiar training areas. While plenty of things could still go wrong, there were several known locations where antennas had been placed numerous times. Each antenna on a high spot could send and receive unobstructed signals to a few other antennas on other high spots. With cellular-based communication, units in seemingly constant motion and commanders as demanding as ever, she is looking for more sites where her antennas can communicate, not just with each other but with units on as much of the surrounding terrain as possible.

The high spots are easy to find. But where are the places that antennas 10 meters off the ground can cover the most area? How about antennas 15 meters off the ground? The answers to these questions can be extracted from the thin contour line patterns on paper maps by a suitably determined individual with unlimited time. Now all she has to do is find that person. . . .

Paper maps have long been used by the military. Today, they are more accurate and detailed than ever before. However, when we add more information to our maps, we are more frustrated when we try to use them. We see a large amount of potentially valuable information literally before our eyes, but we have no efficient way to put much of that information to use.

Man-made features, such as bridges and built-up areas, may have an obvious military significance. The experienced eye can see mobility information (go, slow-go and light infantry only) in contour lines, background colors and other symbols. When it comes to visibility, however, the situation changes.



Terrain determines the number of avenues available to a commander's maneuver elements and affects their speed of movement.

Much of the valuable elevation information on a paper map comes from finding out which specific platforms can sense, communicate with or fire upon other platforms in the area. Obtaining a clear line of sight (LOS) between two points depends on the height above ground of the observer, the target and the terrain between them. A clear LOS is fairly straight for visual sensors and direct-fire weapons and curved to varying degrees for electromagnetic sensors and indirect-fire weapons.

A defender who is dug in requires straight LOS between observers and targets that are close to the ground. An air defense radar requires an electromagnetic LOS to targets that are higher off the ground than vehicles, which are very possibly at lower altitudes than surrounding hills.

Each visibility question is a combination of observer location, observer maximum effective range, LOS type, observer height and target height. One should ask, "What can I see if I set up here?" The answer can be found from map elevation contours, but the manual process to do this is labor-intensive, error-prone and time-consuming. Draftsmanship precision in constructing the profile for each LOS may be essential for accurate results. Long distances (more than 10 km) introduce other complications because of the curvature of the earth.

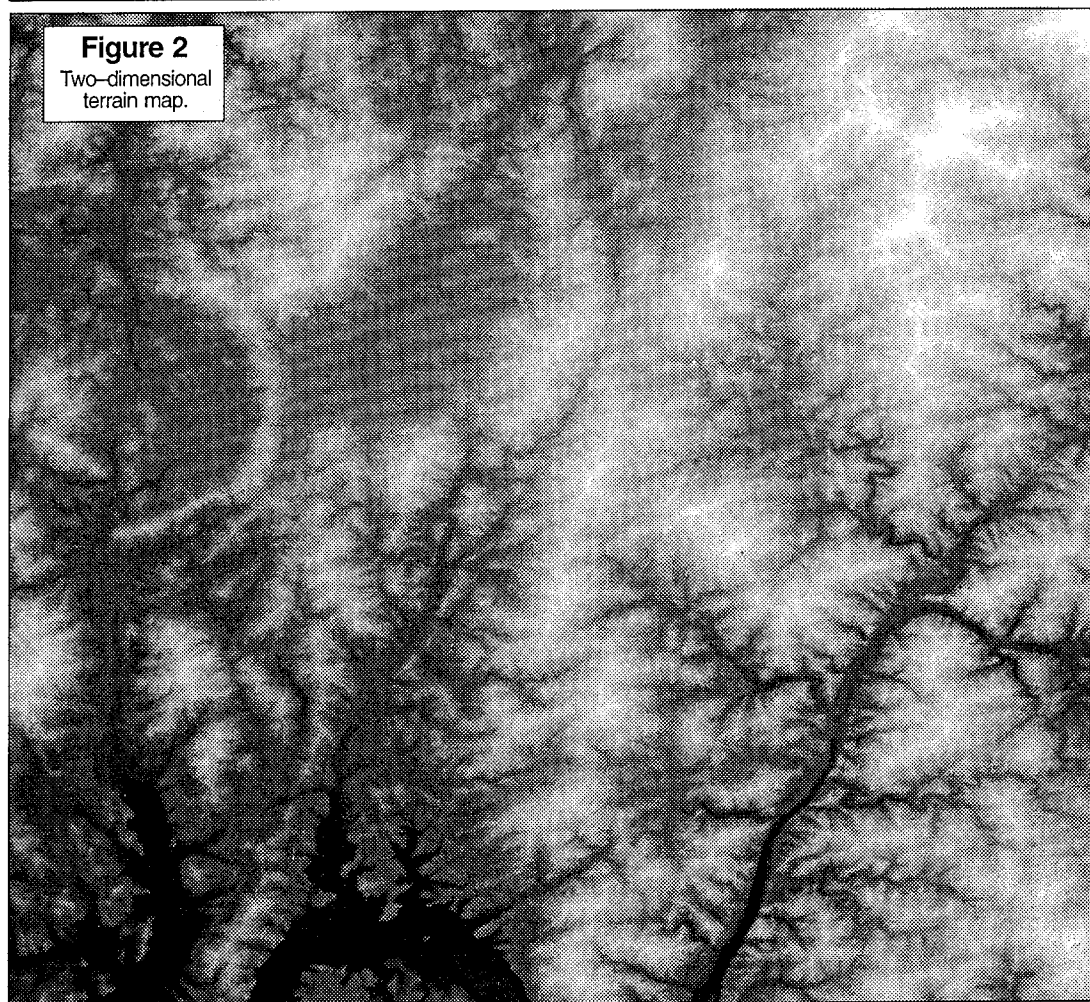
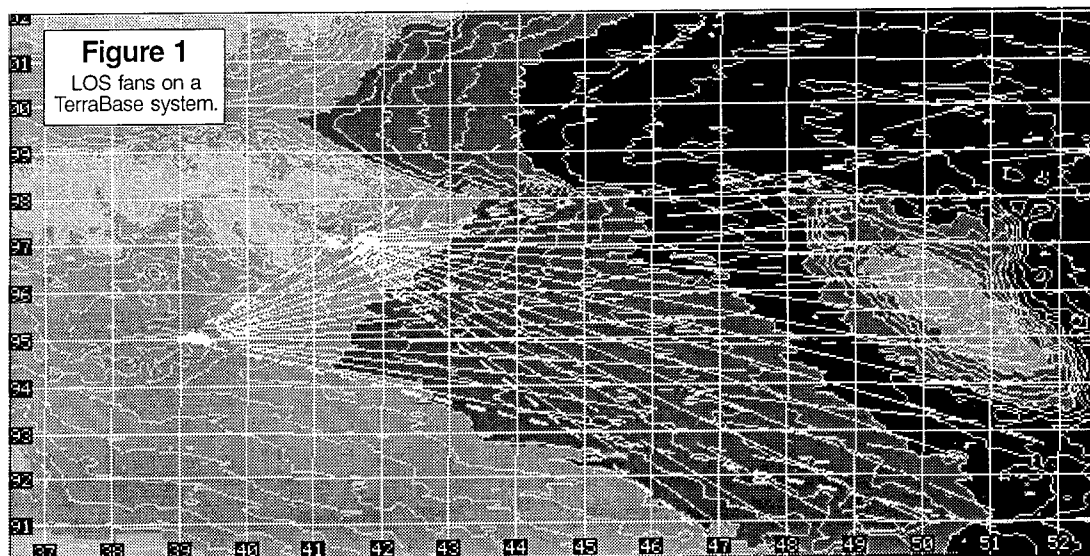
Even after constructing a detailed LOS survey for one combination of locations and characteristics of the observer and target, only a small part of the total

visibility picture has been figured out. What if we defend with tube-launched, optically tracked, wire-guided missiles emplaced at ground level instead of with tanks in a tree line whose sights and weapons are 2 meters above the ground? What if the attacking aircraft fly 10 meters closer to the ground than anticipated?

Manual visibility methods are even weaker when comparing alternative sites. Which locations should be evaluated? The choice is often far from obvious. The entire concept of a "military crest" illustrates the weakness of simply choosing the highest elevations to provide the best visibility.

There is another problem when comparing alternate sites even after constructing their separate visibility profiles. When we overlay alternate sites on a map using acetate and grease pencil, we soon run out of distinguishable colors and are left with a staff school monstrosity. If we do not combine them on the same map, comparison becomes difficult. If we want better visibility information, what capabilities should be depicted? We must:

- Compare the visibility characteristics of many locations in some efficient and intuitive way.
- Evaluate and compare terrain from different observers' and targets' viewpoints.
- Vary the amount of detail presented as we investigate and find the most interesting locations.
- Represent meaningfully the visibility of an area (such as battle position, assembly area and



blocking position) instead of a single point.

These goals lead to one obvious question—"Why not use automation to solve the problem?" Automation has been successfully applied over the years to a variety of terrain analysis problems. The US Army Topographic Engineering Center, the Waterways Experiment Station and departments at the US Military Academy are among the agencies that have developed automated systems to help with terrain visualization, mobility estimation, satellite imagery analysis and other decision aids.

Figure 1 shows a product of one such system, TerraBase, showing elevation near the "whaleback" at the NTC. Although elevation information is well represented by tints and contour outlines, attempts to represent visibility by plotting LOS-fans from just two locations have begun to clutter the image. Too many LOS-fans become confusing. If, however, we plot several LOS-fans on separate sheets, we lose the ability to easily compare them.

There are several ways terrain analysis software can represent visibility, although many of these tools only automate the manual process of constructing LOS-fans. Computing large numbers of LOS-fans can take a substantial amount of time, especially for users who do not have special purpose computers. Typically, the human operator is still responsible for choosing the locations to investigate and analyzing the results the computer produces.

In short, most automated visibility tools only automate the manual task of looking through the visibility "puzzle box" one piece at a time. While automating the manual process is valuable, what is needed is an entirely different way of presenting visibility information.

The military community is already familiar with a variety of two-dimensional terrain graphics, such as those that show terrain type, elevation and mobility. As an example, Figure 2 shows elevations of an area approximately 50 km on each side of the

Figure 3

Air defense visibility map of same terrain as Figure 2.

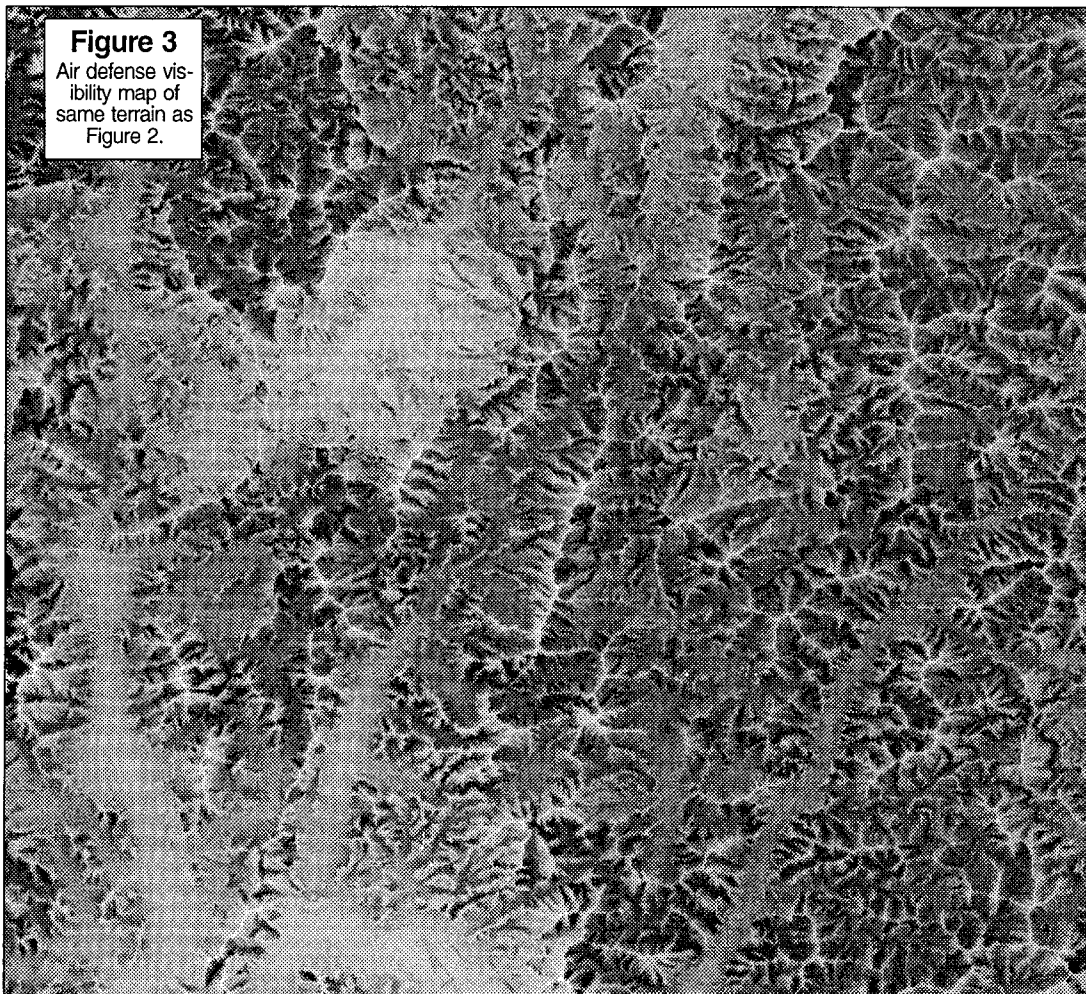
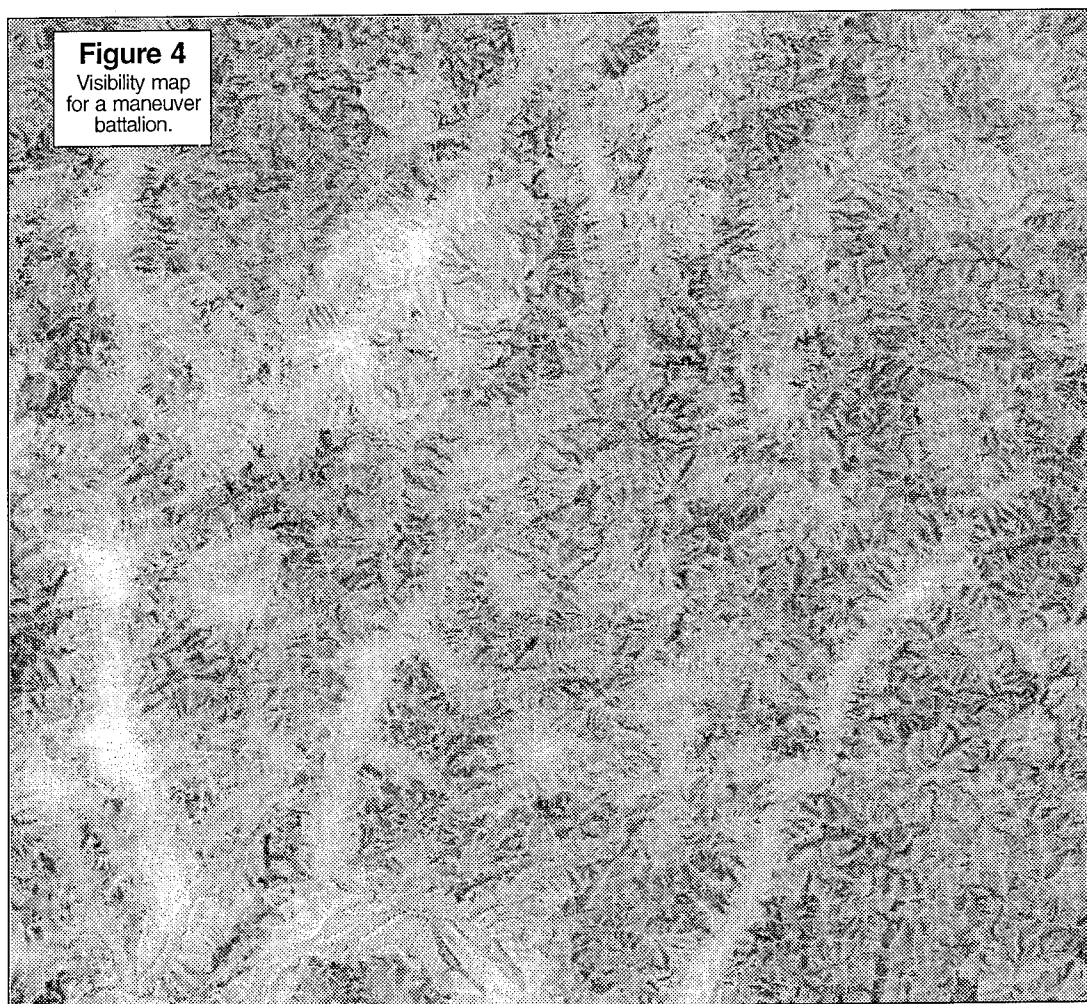


Figure 4

Visibility map
for a maneuver
battalion.



Korean peninsula. Higher elevations appear as lighter tints, while lower elevations appear darker. Building on this familiar two-dimensional model, it is possible to create visibility maps.

In a visibility map, each location is tinted in gray-scale or color to represent the relative visibility from that point. Using gray-scale tinting, a point with a high relative visibility outward to the surrounding area will appear as a light gray or near white. A point of low relative visibility will appear as a dark gray or near black.

Figure 3 shows the visibility map of the same terrain as that shown in Figure 2. Visibility was calculated for a hypothetical air search radar with a 5-meter-high antenna attempting to track an aircraft flying 25 meters above the ground out to a maximum range of 40 km. Although it is easy to identify some similar feature outlines in each map, there are important differences.

In the upper right corner of the Figure 2 elevation

map is a grouping of high elevations. The center and bottom of the left side contain lower elevations without obvious distinguishing characteristics. However, when these areas are viewed in the Figure 3 visibility map, we see that much of the higher ground offers poor visibility, while many areas of lower terrain provide better visibility than many other locations on the map.

The visibility map makes it possible to gain visibility information on many points of a single image without clutter, because areas of high visibility appear as "white islands." Areas of high elevation with low visibility are readily found by comparing the elevation and visibility maps.

Even on the same terrain, visibility is different for different users. Figure 4 shows visibility of the same Korean terrain from the perspective of a mechanized infantry battalion commander looking for locations to set up a defense against a mounted attack. Where can hull down defending vehicles or dismounted antitank

missiles have the best view of attacking enemy tanks?

By calculating visibility for an observer about 1 meter above the ground to targets 3 meters high, the result is a visibility map dramatically different from both the elevation map and the air defense visibility map. More locations stand out as having potentially good visibility characteristics. More areas of low elevation reveal significant local variations in visibility, inviting a "zoomed in" look to begin detailed selection of company battle positions.

Having seen visibility maps showing a measure of raw visibility in all directions around a point, the next question is, "How can we show relative visibility in different directions?" An area suitable for a company team may have high, all-around visibility, but if most of that visibility is not in the direction of the enemy advance, another site must be chosen. The brightness of a point shows its overall visibility, but color can be used to tell us something about visibility in different directions. For example, red could represent northward visibility; green, visibility to the southeast; and so on.

Although computing visibility maps still requires a fair amount of computer "horsepower," displaying gray-scale and color visibility maps and identifying

points with the greatest visibility can be accomplished on inexpensive desktop or notebook personal computers. This makes visibility maps available to virtually any interested military user.

Visibility maps can provide an entirely new way for commanders and staffs to see terrain. Visibility information can be tailored to specific needs, such as maneuver, communication and air defense, just to name a few, and made available on common, inexpensive computer hardware. Given sufficient interest and resources, visibility data sets can be computed and distributed for any area of the world for which elevation data is available. **MR**

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MR Book Reviews

THE GENERALS' WAR: The Inside Story of the Conflict in the Gulf by Michael R. Gordon and General Bernard E. Trainor. 525 pages. Little, Brown & Co., Boston, MA. 1994. \$27.95.

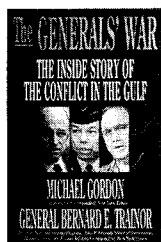
New York Times' military correspondent Michael R. Gordon and retired Marine Corps Lieutenant General Bernard E. Trainor write what is unquestionably the best book published to date on the 1990-1991 Gulf War. Indeed, Trainor's military stature and, doubtless, his current position at the John F. Kennedy School of Government at Harvard University and connection with the *New York Times*, won him a rare interview with General Norman Schwarzkopf. Schwarzkopf may regret the interview when he reads *The Generals' War*. Gordon and Trainor are not sparing in their criticism of him, either for his conduct of the Gulf War or of his autobiographical memoir, *It Doesn't Take a Hero*.

This book is principally an account of the conduct of war at the strategic and theater-strategic levels. Its focus is fixed on two sets of relationships and

interactions. One set is between Secretary of Defense Richard B. Cheney, Chairman of the Joint Chiefs of Staff General Colin L. Powell and US Central Command commander Schwarzkopf. Another set is between Schwarzkopf and his principal subordinates. Around these solar figures revolve lesser personalities, undersecretaries, advisers and subordinates. Each, in turn, is continuously trying to exercise influence through or over his boss or, more surprisingly, over or through his boss's boss.

One of the most instructive features of this story is the social one. Gordon and Trainor demonstrate that individual people do matter. Even in supposedly hierarchical organizations, with relationships and responsibilities fixed by statute, bright lieutenant colonel true believers can and will minute their service secretary when they believe their theater commander does not appreciate the wisdom of their plan or the core faith of their service. How this squares with institutional values of loyalty within the chain of command is a question that should cause some institutional self-examination.

Gordon and Trainor's research for *The Generals' War* outstrips any of their competitors'. Their scope



is broad, taking in "inside the beltway" diplomacy, both land and air components in-theater and, more important, Operations *Desert Shield* and *Desert Storm*. As such, it surpasses in comprehension its nearest competitor—Rick Atkinson's *Crusade: The Untold Story of the Persian Gulf War*.

There are a few caveats to this large sweep: the role of the US Navy is neglected, particularly the naval blockade; more sources than most historians or careful readers will find acceptable are identified by euphemism, such as "an intelligence officer," which keeps the account somewhat provisional; and the authors take a frequently breathless "now it can be told" style that is not always warranted. Still, there is a good deal new in the account, particularly postwar intelligence assessments. The book has clear maps and informative footnotes.

While Trainor tries very hard to be dispassionate and fair in his judgments, he is unable to distance himself from his long association with the US Marine Corps. Thus, the "Jedi Knights" (Schwarzkopf's special planning cell) are condemned for taking the British armored division from the Marine task force, in *collusion* with the British theater commander, Sir Peter de la Billiere (whose role and judgment in this matter Trainor and Gordon apparently feel was secondary). At the same time, the Army is criticized for stinting on the brigade task group it was required to provide to replace the British formation. In spite of this, Schwarzkopf is condemned for giving the Marines so much force that they later upset his plan by driving the Iraqis out of his intended envelopment. The possibility that this could occur was the Jedi's overly *doctrinaire* objection to begin with. The Marines, only a two-division force, were supposed to be a supporting attack.

Trainor and Gordon are unsparing in their criticism of the Army generals but seem to find the Marine leaders paragons in almost every respect. Whether one agrees in the end with their criticism, they are clear about the criteria they use to make their judgments.

There is a final important point central to the whole structure of the authors' judgments—their idealist or romantic philosophical view of the conduct of war. Trainor and Gordon are members of the "on to Baghdad" school of critics of the war's outcome. The most revealing quotation is their criticism of President George Bush: "Bush may have made the generals more comfortable by exercising restraint. But he failed to exploit the benefits that accrue to those who exercise overwhelming power. It allows those who exercise it to set the agenda and the course of the future on their own terms."

America lives in a world it can lead but cannot dominate. Bush's policy in the Persian Gulf was predicated, in part, upon maintaining a coalition that

could be exploited after the war, as well as during its conduct. Bush, therefore, had to consider the view of the man in the street in various Arab capitals, as well as the man on the street in Peoria, Illinois. That is a concomitant cost to coalitions whether or not it suits military purists.

Almost 200 years ago, the Prussian philosopher Carl von Clausewitz discovered that his developing theory of war, based upon a sort of romantic idealism that evaluated war in terms only of its own internal and logical imperatives, was inadequate to explain war as it actually existed. In 1827, he undertook a significant revision of his book to account for the difference. In the end, he observed that "*war is nothing but the continuation of policy with other means.*" Absolute war is easier to deal with conceptually, but it seldom meets the needs of the moment—the contingent circumstances.

Against Trainor and Gordon's ultimate proposition, one might draw on the warning of that other timeless military theorist, Thucydides the Athenian, and note the cause of the ruinous Peloponnesian War as a caution against the sin of hubris in would-be sole superpowers. "What made war inevitable," Thucydides wrote, "was the growth of Athenian power and the fear which this caused in Sparta." A more modest view of the practical limits on the exercise of power would change many of the judgments offered by the authors.

The Generals' War more than justifies the three years taken in preparation. The book should be essential reading for all students of war at the theater and theater-strategic levels. It provides fruitful ground for informed debate of professional ethics, US civil-military relations, strategy and tactics and, not least, the various roles and missions of the US Armed Forces. Those concerned with the latter would be particularly wise to read the book's judgments closely, in light of Trainor's current position on the commission, chaired by Harvard University's John White, that is examining service roles and missions for the 21st century.

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A LEAGUE OF AIRMEN: U.S. Air Power in the Gulf War by James A. Winnefeld, Preston Niblack and Dana J. Johnson. 335 pages. RAND Corporation, Santa Monica, CA. 1994. \$30.00 clothbound. \$15.00 paperback.

The reader might justifiably expect to encounter a self-serving report emphasizing parochial US Air Force views on the accomplishment of air power in the Gulf War in *A League of Airmen*. However, the authors clearly state that they carry no Air Force brief. Unlike other major RAND research efforts,

they say, their focus is on the broader "total force" roles and effectiveness of air power in the Gulf War.

The authors deliver what they promise. This is arguably the most objective and least parochial project to date. *A League of Airmen* touches on everything from the broad issues of air power doctrine, command and control and supporting the infrastructure, to the minutiae of individual weapon systems and tactics and the overarching areas of air power theory and history.

Perhaps its strongest selling point is its basic readability. Material is presented so that the air power novice is not overwhelmed by the breadth and magnitude of the subject. Neither is the air power enthusiast left with nothing of substance upon which to ponder. To provide this broad perspective, the authors relied heavily on original RAND research before, during and after the conflict, on extensive interviews (most of non-Air Force personnel) and on a large body of secondary sources covering nearly all aspects of air operations in the gulf.

The authors intentionally avoid strict statistical analyses and comparisons. They note correctly that numbers alone are too often produced to support preconceived conclusions or are subject to wide and, therefore, largely meaningless interpretations. Instead, such empirical data are simply considered alongside authoritative subjective analyses. Still, for those interested in numbers, the authors have included a 28-page appendix that presents in graphic form all statistical data supporting the body of text.

A League of Airmen begins with a discussion of the setting for the Gulf War. It brings the reader to an understanding not only of the geopolitical aspects of the conflict but also of the technological, doctrinal and service issues bearing on the subject of air power. With this foundation, it then covers in great detail such areas as the deployment of forces; air power planning; command, control and organization; air power operations; tactics; and air combat system performance.

Of particular interest are the analyses of logistics and information acquisition and management. While many consider these subjects dull in the extreme, the authors consider US efforts in both areas to have been qualified successes and critical to victory in the war. They are so concerned with the need for adequate logistic support for air power operations that they go one step further and discuss several truly insightful logistic implications of Operations *Desert Shield* and *Desert Storm* for future military conflicts. The authors consider *Desert Storm* to have been the first modern "information

war" because of the extensive use of and dependence on information at all levels and in all media. Both the successes and failures of this war are impartially recounted, explaining why much of what occurred in the gulf unfolded as it did.

In the last two heavy-hitting chapters, the authors give their overall assessments of air power effectiveness. The first of these chapters discusses the performance of the constituent elements of air power. The authors deal with a host of the most controversial issues influencing the entire subject of air power in our country today. These issues include the role of the joint force air component commander, land-based versus sea-based air, heavy bombers versus fighter-bombers, precision-guided munitions, intelligence, battle damage assessment and lift planning.

The final chapter is the most important. It addresses the fundamental question both asked and answered by every "expert" since the war ended. Was air power the decisive element of victory in the Gulf War? The authors first point out the importance of answering this question correctly because of the potential impact the answer will have both on future force structuring and on our consequent ability to effectively defend our nation's interests. The authors leave you with an answer that is more than a simple yes or no.

The authors have done an extremely credible job of equitably addressing all sides of contentious subjects, making their arguments often difficult to refute. They conclude that the uncertain environment of the future "will place an even greater premium on fighting as a true league of airmen and not as a collection of service air forces with a veneer of jointness."

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LOW-INTENSITY CONFLICT: A Guide for Tactics, Techniques and Procedures by James J. Gallagher. 210 pages. Stackpole Books, Harrisburg, PA. 1992. \$14.95.

With the end of the Cold War, low-intensity conflict (LIC) is becoming an essential component of the US Army's AirLand Operations doctrine. Aside from Operation *Desert Storm*, most US conflicts probably will be of the LIC variety, such as Operations *Urgent Fury*, *Just Cause* and *Restore Hope*. Other LIC operations might include peacekeeping and antiterrorism operations, insurgency, counterinsurgency and antinarcotics.

Command Sergeant Major (CSM) James J. Gallagher appears well-qualified to write *Low-Intensity Conflict*, having spent 30 years in the US Army and seeing action in both Korea and Vietnam. He served as a CSM at battalion, brigade and division levels. He was the US Infantry School and Center CSM,

Fort Benning, Georgia, when he retired.

In a 210-page book, Gallagher covers a broad range of LIC subjects, including command, control, communications and intelligence; insurgency and counterinsurgency operations; peacekeeping; counternarcotics; and antiterrorism. Ultimately, this is the book's downfall.

The subtitle, "A Guide for Tactics, Techniques and Procedures," indicates that this is a guide book for the LIC practitioner. While this may be what Gallagher intended, he fails because he covers too much ground. Insurgency and counterinsurgency operations are covered in only 40 pages, one-third of which is devoted solely to ambushes. Peacekeeping operations receive short shrift with only 20 pages.

In the chapter on terrorism, the author becomes quite loquacious and sometimes questions the reader's intelligence. The reader is advised that if caught in an ambush, one should "depress the gas and propel the vehicle forward and clear of the kill zone." In other words, "Step on it as hard as you can!" Gallagher also advises us "not to . . . upset, offend or disturb the terrorists . . . you may be playing games, but they are not." He further cautions that we should not be alarmed if the terrorists use drugs, blindfolds or gags when abducting us. Gallagher might be a pillar of self-control while enduring such an event, but the average person will be terrified.

Gallagher states that his book is a "how to" primer to be used until official publications appear. Yet throughout he refers to various US Army field manuals (FMs), such as FM 100-20, *Military Operations in Low-Intensity Conflict*, and much of the book appears to be garnered directly from FM 7-8, *The Infantry Platoon/Squad (Infantry, Airborne, Air Assault)* and FM 90-8, *Counter guerrilla Operations*. His bibliography consists solely of FMs, Army bulletins and instructor notes. The serious practitioner of LIC would do well to consult these sources first.

Cadet Aaron VanAlstine, ROTC,
Northern Michigan University, Marquette, Michigan

LANDMINES: A Deadly Legacy by The Arms Project of Human Rights Watch and Physicians for Human Rights by Stephen D. Goose and Kenneth Anderson. 510 pages. Human Rights Watch, Washington, DC. 1993. \$25.00.

After reading the meticulously assembled *Landmines: A Deadly Legacy*, the military reader can construct a didactic riddle. The questions are: What crop costs a hundred times more to reap than to plant and has no market value when harvested? What weapon is still lethal to unsuspecting human targets when the soldiers who brought it to the battlefield have become old men? What Cold War legacy has the greatest mathematical probability of claiming

victims now and for the next couple of generations? What weapon employed by US forces under scrupulous adherence to the laws of land warfare may have inflicted more friendly than enemy casualties in several campaigns?

If the reader's answer is "antipersonnel landmines," lots of pages in this book can be dog-eared to support the conclusion. Stephen D. Goose is the Washington, D.C., office director for The Arms Project; Kenneth Anderson is the director of The Arms Project, a unit within the nongovernmental organization Human Rights Watch. These two authors collaborated strongly with Eric Stover, executive director of Physicians for Human Rights, to prepare what may be the most objective and best documented piece of advocacy literature on human rights.

From different viewpoints, the authors show who produced the Cold War flood of antipersonnel mines and they give lots of data on who sold them to whom and who emplaced them. They seek to have antipersonnel mines made illegal under international law, throughout the cycle of production, marketing, distribution, military doctrine and employment. They want a strong worldwide commitment to discovery and removal of the millions of antipersonnel landmines that still exist.

Problems abound in limiting this one frequent and technologically simple cause of human suffering. Nonmetallic casing or minimum-metallic construction makes discovery a nightmare. Aerial distribution done by the United States in Vietnam and by the former Soviet Union in Afghanistan compounds the discovery problem. The authors do not deal meaningfully with the plight of, for example, the army commander in Bosnia, who is both outgunned and operating under an arms embargo not imposed upon the other side.

Unlike many human rights activists, however, these authors do not inordinately blame the military for the worldwide landmine diffusion problem; indeed, they acknowledge that US military forces have often set a standard for careful recording and later removal of minefields. They have positive commentary on US diplomatic and juridical leadership in seeking a binding treaty on limiting or prohibiting the use of antipersonnel mines.

Landmines offers a factual basis for an arena too often trivialized by intellectualized emotionalism. The book is fundamental military reading, not merely for technical leaders and doctrine specialists in the US Army Corps of Engineers but for general staff officers and commanders at all levels. It belongs in the curriculum support package at all the professional military education schools and colleges. The Judge Advocate General courses and military medicine curriculum should include a teaching unit based on this book. Its objectivity shows that the human rights

nongovernmental organizations and the Department of Defense could become functional allies on both research studies and field operations.

Russell W. Ramsey, *US Army School of the Americas, Fort Benning, Georgia*

HOODWINKING HITLER: The Normandy Deception by William B. Breuer. 263 pages. Praeger Publishers, Westport, CT. 1993. \$24.95.

An important component to the success of Operation *Overlord* was the deception plan developed to mislead Adolf Hitler as to the date and location of the cross-Channel invasion. Code-named Operation *Bodyguard*, the operation included five major arenas of secret activities: deception, security and counterintelligence, offensive intelligence, political warfare and what author William B. Breuer terms "brutal, unadulterated mayhem." *Hoodwinking Hitler* is the story of how an ingenious group of men and women conceived and executed the most brilliant hoax in military history.

Breuer, a veteran of the initial assault on Normandy, weaves an intriguing tale of espionage, double agents and camouflage in describing the elaborate efforts by the Allies to convince Hitler that the invasion might strike the European Continent anywhere from Norway to the Balkan peninsula. So convinced was Hitler that the Normandy landings were only a diversionary effort and that the main assault would be near Calais that he held back important *panzer* reserves needed to defeat Operation *Overlord*. To his credit, Breuer also discusses the attempts by Joseph Goebbels, the Nazi propaganda minister, to drive a wedge between the Anglo-American alliance and possibly forestall the invasion.

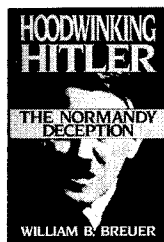
Perhaps the most surprising aspect of this book lies in the amount of resources dedicated to the espionage effort. At one time, Admiral Wilhelm Canaris alone controlled over 16,000 agents, of whom 256 operated in Great Britain. Numerous German agents also operated as double agents under a scheme developed by British Major Thomas Robertson, whereby captured German spies would be put to work double-crossing their former Nazi masters instead of being hanged.

If the book has a shortcoming, it is the author's propensity to accept most every innuendo and rumor as factual. Breuer cites no evidence to support his allegation that General Dwight D. Eisenhower wrote Army Chief of Staff General George C. Marshall concerning his intention to divorce Mamie and marry his female aide. Nor does the author sub-

stantiate his claim that operational differences among the senior members of the Allied High Command seriously "threatened to undermine Allied solidarity" on the eve of the invasion. That conflicting opinions existed concerning the employment of air-borne forces is undeniable; whether they actually threatened the cohesion of Supreme Headquarters, Allied Expeditionary Forces, is highly speculative.

These shortcomings notwithstanding, Breuer has written the most complete account on the Normandy deception. *Hoodwinking Hitler* is a major contribution to the historiography of World War II and mandatory reading for anyone desiring to learn more about the largest and most successful amphibious operation in history.

COL Cole C. Kingseed, *USA, US Military Academy, West Point, New York*



THE ICARUS SYNDROME: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force by Carl H. Builder. 299 pages. Transaction Publishers, New Brunswick, NJ. 1994. \$39.95.

The Icarus Syndrome is an intellectually engaging work and particularly timely considering the current roles and missions review by the Department of Defense (DOD) and the US Congress. RAND analyst Carl H. Builder looks at the role of air power theory both historically and functionally. He comes to two very dramatic conclusions. First, "air power theory was a crucial element in the evolution and success of the [US] Air Force as an independent military institution." Second, "the subsequent abandonment of air power theory in the face of competitive means (missiles and space) and ends (deterrence theory) cast the Air Force adrift from precisely those commitments that had propelled it to its institutional apogee in the 1950s." In effect, Builder asserts that the Air Force was satisfactorily established by visionaries who successfully advocated the efficacy and independence of air power.

Unfortunately, according to Builder, something went wrong within a decade of existence for the fledgling service. The DOD, under Secretary of Defense Robert S. McNamara, reinforced a subtle shift of emphasis from air power theory to the business of procuring bigger, better and faster aircraft and missiles. This lack of institutional focus has manifested itself in many ways. Builder points to the dissatisfaction within the Air Force over the dominance of pilots in senior leadership positions and friction with other services on military roles and missions as two visible examples of vision and mission gone wrong. To his credit, Builder goes on to offer alternative vision and mission statements (embracing an updated theory of aerospace power)

to get the Air Force back on track.

There is much to like about this book. One of its strengths is Builder's ability to synthesize a considerable amount of institutional rhetoric, then condense that synthesis into meaningful summaries. The author's conclusions are skillfully developed and clearly articulated, and I intuitively agree with much of what he claims. Emotions aside, however, I had difficulty with portions of the book.

The first 190 pages of *The Icarus Syndrome* contain poor examples of formal writing. Builder pens a few words of his own, then offers a compilation of extensive quotations from others. Not only does this slow the reader down, but the overuse of block quotations results in repetitious phrases and problems of chronology. The author would have been better served by offering a much shorter historical background and perhaps including a bibliographical essay on sources. Analysis is Builder's strength, and he should have exploited that talent by quantifying his assertions. Hard evidence, after all, goes a

long way to convincing skeptics and requires shorter leaps of faith.

Although overpriced and suffering from the problems just mentioned, *The Icarus Syndrome* is still a valuable think piece. Not everyone may want to purchase this book, but everyone needs to read it.

LTC Jeffrey C. Prater, USAF,
Combat Studies Institute, USACGSC

HOLLOW VICTORY: A Contrary View of the Gulf War by Jeffrey Record. 192 pages. Brassey's (US), Inc., McLean, VA. 1993. \$22.00.

Iconoclastic defense analyst Jeffrey Record's fourth book, *Hollow Victory*, is a military, political and strategic assessment of the Gulf War. It examines "some troubling issues" worthy of debate. According to Record, the war was unique in US experience. It was "short, victorious, and cheap." It was the "only foreign conflict in American history that did not catch US military forces unprepared." Yet, the author con-

PASS IN REVIEW

THE SOLDIER'S MEDAL: A History of the US Army's Highest Award for Non-

Combat Valor by Frederic L. Borch III and William R. Westlake. 271 pages. Published by the authors, 1444 West LaJolla Drive, Tempe AZ 85282-4457. 1994. \$20.00.

The authors trace the origin and evolution of the Soldier's Medal, an award for heroism in a situation not involving combat (frequently including a rescue or attempt to rescue another in an emergency). They include a partial but extensive listing of the recipients (including many names the reader will recognize), organized by year from 1927 to 1993. Adding color are the many citations and photographs of the recipients. Historians and collectors interested in military decorations will find this a valuable resource.—Christopher R. Gabel, *Combat Studies Institute, USACGSC*

D-DAY NORMANDY: The Story and Photographs

by Donald M. Goldstein, Katherine V. Dillon and J. Michael Wenger. 180 pages. Brassey's (US), Inc., McLean, VA. 1994. \$30.00.

This official commemorative Battle of Normandy Foundation book celebrates the 50th year since the invasion of Hitler's *Festung Europa*. Containing over 400 black and white photographs and tied together with a minimum of text, the book documents the participants, preparation, practice, operations and results of the D-Day invasion. You will find action photographs that depict almost every major player and item of equipment. *D-Day Normandy* is a useful historical work that will complement everyone's D-Day and World War II collection.—MSG James H. Clifford, USA, Andrews Air Force Base, Maryland

SECURITY STUDIES FOR THE 1990s.

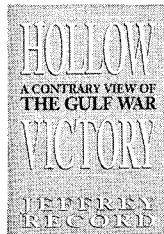
Edited by Richard Shultz, Roy Godson and Ted Greenwood. 423 pages. Brassey's (US), Inc., McLean, VA. 1993. \$50.00.

The editors believe a significant change is needed in the security studies curricula of American universities. They propose a model curriculum for consideration, including course structure outlines, bibliographies and proposed syllabi. Each proposed course is laid out by an expert in the field and then critiqued by two or three "discussants." Although this is a book written by academics for academics, it is still useful to those who would stay abreast of the security strategy curricula taught and considered at our universities.—MAJ D. G. Rathgeber, USMC, Marine Expeditionary Force, Okinawa, Japan

cludes, the "magnificent military victory" ended in a "major American political defeat."

Record reaches these conclusions by analyzing key issues. He ponders how the United States and Iraq might have avoided war and whether UN sanctions could have succeeded against Iraq. He asks how the US intelligence community could have so drastically overestimated Iraqi fighting power.

The unique "operational setting" so advantageous to the United States in Southwest Asia is unlikely to be repeated, Record warns. He shows how a generalissimo more militarily skillful than Saddam Hussein could have "derailed [Operation] *Desert Storm*," but he maintains that Hussein was politically astute. After weighing the relative contributions of air, ground and naval power, Record rates the air campaign a strategic failure. He finds



that the coalition's ground operations, "not its capacity to bomb territory, was the straw that broke the camel's back." Studying the effect of the 1986 Defense Reorganization Act on the interaction between the services and between military and civilian leaders, Record faults Joint Chiefs of Staff Chairman Colin L. Powell for not offering unsolicited advice to President George Bush.

Record suggests which lessons "can—and cannot—be safely drawn" both by the United States and its potential adversaries. He highlights the need for investment in airlift, sealift, maritime positioning, antimine warfare, special operations, theater ballistic missile defense, logistic sustainability and precision-guided munitions and delivery systems. Moreover, he argues the United States may no longer be able to execute an operation on the scale of *Desert Storm* due to defense cuts.

In the final chapter on the war's political aftermath, Record condemns the Bush administration for its premature conflict termination. By ending the

SUBMARINE DETECTION FROM SPACE: A Study of Russian Capabilities by Hung P. Nguyen. 79 pages. Naval Institute Press, Annapolis, MD. 1993. \$25.95.

This small book is the result of a literature search covering the last 25 years of publications and proclamations by Soviet and US experts on naval warfare and sea defense. The author uses the experts' statements to develop his conclusion that the Soviets (now Russians) have developed a capability to detect submarines using space satellite technology. This is an interesting but hardly enlightening book since there are so many speculations and inferences made by the author.—LTC James P. Hartman, *USAR, Retired, Aiken, South Carolina*

OPERATION ANADYR: U.S. and Soviet Generals Re-count the Cuban Missile Crisis by Generals Anatoli I. Gribkov and William Y. Smith. 252 pages. Edition Q, Inc., Chicago, IL. 1994. \$24.95.

Operation Anadyr recounts the Soviet deployment of nuclear missiles to Cuba and the immediate result—the October 1962 Cuban Missile Crisis. The authors describe in considerable detail the critical events of the crisis when the United States and the Soviet Union were poised on the brink of nuclear war. They reveal, from the perspectives of the two major antagonists, the political mechanisms that ultimately produced the crisis resolution. They also underscore the distrust that existed between the Joint Chiefs of Staff and the Kennedy administration.—LTC C. W. Rittenhouse, *USAR, 4155th USAR School, Oklahoma City, Oklahoma*

CODE NAME COPPER-HEAD: My True Life Exploits as a Special Forces Soldier by Joe R. Garner with Avrum M. Fine. 431 pages. Simon & Schuster, Inc., New York. 1994. \$23.00.

Reading this memoir is akin to sitting down with your team sergeant and getting installments on life as a Special Forces (SF) soldier. Joe R. Garner shows how his life before the Army prepared him for what was to come and covers his time during the SF's early years, through the Vietnam War, to the events leading up to his retirement. This book could be used as a guide for preparing jungle combat patrols. It also gives the criteria for leadership evaluation used by the soldiers the Army came to admire and despise. I recommend this book to squad, platoon and company leaders.—MAJ Bruce Ressler, *USAR, 416th Civil Affairs Battalion (Group), Norristown, Pennsylvania*

war too soon, the author charges, Bush forfeited political victory, leaving "intact the principal source of instability in the Gulf."

Readers interested in the Gulf War and national security will find *Hollow Victory* provocative and rewarding. Record's "what if" approach will challenge them to think and encourage them to search for answers and draw their own conclusions. For future enemies, the book provides a blueprint on how to outmaneuver the United States. Those involved in all aspects of US foreign diplomacy and national security should heed Record's insights.

The author's exclusive reliance on published sources results in some factual errors and shallow observations, especially regarding intelligence shortcomings. Furthermore, in dealing with the air campaign, Record considers only its effectiveness—which cannot be accurately gauged until the Iraqi side of the story is known—and overlooks the critical problem of coordinating multiservice air assets. Students of the war will note that more recent literature has provided much of the meat missing from this bare bones work, particularly regarding the decision to end the war. While *Hollow Victory* is destined to be eclipsed, it will be decades before *Desert Storm's* main issues are "fully or satisfactorily explored." This book is an important early contribution offering valuable insights and food for thought.

LTC Steve E. Dietrich, USA,
Center of Military History, Washington, D.C.

THE WEST POINT WAY OF LEADERSHIP: Learning Principled Leadership to Practicing It by Larry R. Donnithorne. 189 pages. Doubleday & Co., Inc., New York. 1993. \$24.00. 2 Cassettes, \$15.99.

There have been countless books published on the subjects of management and leadership that promote the concept of excellence, total quality management, the habits of successful people, and so on. None of these, however, will have the extraordinary impact of this small, exceptionally well-written volume by Colonel Larry R. Donnithorne, US Army, Retired. His recent work describes America's time-tested leadership program at the US Military Academy (USMA), West Point, New York.

For 188 years, USMA has trained hundreds of tough taskmasters, feisty competitors, astute strategists and fearless decision makers. Their accomplishments on the battlefield and in the "war room" are legendary. But the leadership skills acquired at West Point have proved equally effective in the ci-

vilian world. USMA graduates have served as presidents and chief executive officers of International Telephone and Telegraph Co., Coca-Cola, DuPont Chemical, Eastern Airlines, General Mills and other major companies. USMA is the alma mater of more public and business leaders than the University of Harvard Business School.

Donnithorne points out initially that there is often resistance in the civilian world to the idea that something worthwhile can be learned from the military. He goes on to say that the differences that do exist between the military and civilian leadership are "differences in degree, not in kind. Certain leadership behaviors are achieved at a more accelerated pace than might be the norm in most civilian organizations. Among these are a higher level of obedience, a more lasting sense of loyalty, and the qualities of attention, self-sacrifice, and honesty."

While most good leaders strive to make the right choice rather than the expedient, pragmatic or popular choice, USMA teaches cadets to go one step further—"reaching for the harder right," the decision that will positively affect the greatest number of people. Donnithorne makes a solid case that the progression cadets experience during their USMA years is, in many ways, similar to the rise of individuals through the ranks in the public and private sector—from new employee to first-level, direct management positions, to the indirect leadership of middle management, to executive leadership.

The author takes readers through West Point's "Four Pass" system. Each stage, Donnithorne emphasizes, not only teaches practical skills but gives participants a solid moral foundation upon which to build teamwork, development of the mind, commitment and vision.

The author's background lends further credence to this leadership philosophy. Donnithorne, a USMA graduate, was one of the architects of its current leader development program. He served on the faculty, teaching economics, leadership and moral philosophy and also served as a strategic planner for the academy. Donnithorne is now the president of the College of the Albemarle, Elizabeth City, North Carolina.

There are many lessons to be gleaned from his book. A primary one should be a growing appreciation for the contributions USMA graduates and other members of our Armed Forces are making to society.

MAJ Michael E. Long, USAR,
Headquarters, 360th Civil Affairs Brigade
(Airborne), Columbia, South Carolina

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Leyte

In late July 1944, the central and southwest Pacific commanders, Admiral Chester Nimitz and General Douglas MacArthur, chose the Philippines as the point where their respective offensives would converge. From newly established bases in the islands, the US Fifth Air Force would then be able to easily block off Japan from its vital source of oil and other raw materials in the Netherlands Indies. An invasion of Formosa (Taiwan) would have also accomplished this end but would have put the supply lines of our own invasion force at risk while prolonging the Japanese occupation of a US territory whose 17 million people were overwhelmingly loyal to the United States.

The invasion of Leyte, at the center of the Philippines, was originally slated to be the last of several operations before the culmination of the campaign on the main island of Luzon. The lack of Japanese opposition to raids by Admiral William Halsey's carrier aircraft in September prompted him to report that "the area is wide open," and he suggested that the invasion timetable be advanced. The theater commanders advised the Joint Chiefs of Staff that the proposal was indeed feasible, and three intermediate operations were canceled the day after Halsey's original report.

Earlier that summer, Japan's Imperial Headquarters in Tokyo had also deduced that the two-pronged American thrust through their far-flung island defenses would converge in the Philippines and prepared for what they believed would be the decisive battle of the war. The Japanese army's plans for its 430,000-man force centered on a prolonged, successful defense of Luzon, with its mountainous terrain, reasonably good interior roads plus excellent stockpile of food and supplies. Only delaying actions were to be fought on the outer islands, and consequently, the mediocre 16th Division garrisoning Leyte would have to face four US divisions from the Sixth Army, 1st Cavalry, 7th, 24th and 96th divisions.

US forces landed on 20 October 1944 and began to

prepare the way for the eight fighter and bomber groups that were to be moved up from New Guinea to support the Luzon invasion. Japan's reaction, however, forced US planners to throw their newly revised timetable out the window. Buoyed by reports of both real and imagined US ship losses, Imperial Headquarters now decided to conduct its main battle on Leyte and transferred much of its combat strength, the 1st, 26th, 30th and 102d divisions, to the island along with various independent brigades and regiments. Kamikaze and surface ship attacks disrupted US air support from its carriers, and base construction on the island itself was severely hampered by seasonal monsoons and remarkably poor soil conditions. Although roughly 80 percent of Japan's ships taking part in the reinforcement effort were eventually sunk during the course of their round trips, most troops and supplies arrived intact.

To revive the stalled offensive—and beat back a Japanese ground and parachute assault which briefly isolated Fifth Air Force Headquarters and captured much of the Burauen airfield complex—substantial US forces slated for other operations had to be committed. The 32d, 38th, 77th, 11th Airborne and Americal divisions joined the fight as well as three regimental combat teams. Before all fighting ended in May 1945, the United States suffered more than 3,500 killed and 12,000 wounded and missing. Japanese losses amounted to roughly 60,000 men killed on the island or en route. A number of Japanese units were ordered off Leyte and successfully evacuated in January.

The conquest of Leyte involved over 100,000 more ground troops than anticipated and took so long to accomplish that Leyte never became the major logistical center and air base it was intended to be. In the end, however, Japan's dispatch of critically needed soldiers and supplies to the island effectively crippled the defenses on Luzon—the strategic heart of the Philippine Archipelago.



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