AIR COMMAND AND STAFF COLLEGE
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# A Joint Task Force Staff Structure for the New Millennium

## Leaner, Faster, and More Responsive

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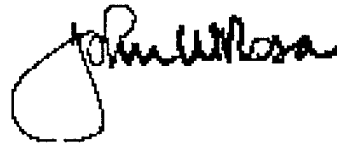
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# *Foreword*

It is my great pleasure to present another of the *Wright Flyer Papers* series. In this series, Air Command and Staff College (ACSC) recognizes and publishes the "best of the best" student research projects from the prior academic year. The ACSC research program encourages our students to move beyond the school's core curriculum in their own professional development and in "advancing aerospace power." The series title reflects our desire to perpetuate the pioneering spirit embodied in earlier generations of airmen. Projects selected for publication combine solid research, innovative thought, and lucid presentation in exploring war at the operational level. With this broad perspective, the *Wright Flyer Papers* engage an eclectic range of doctrinal, technological, organizational, and operational questions. Some of these studies provide new solutions to familiar problems. Others encourage us to leave the familiar behind in pursuing new possibilities. By making these research studies available in the *Wright Flyer Papers*, ACSC hopes to encourage critical examination of the findings and to stimulate further research in these areas.

John W. Rosa, Col, USAF
Commandant

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# *Preface*

*If one has a new way of thinking, why not apply it wherever one's thought leads to? It is certainly enter-taining to let oneself do so, but it is also very illuminat-ing and capable of leading one to new and deep in-sights.*

—Frank Oppenheimer

Profound changes stalk today's military. Professional journal authors and current symposia speakers contem-plate how technology may impact future battle-space func-tions. Other commentators predict effects from military force reductions on our future capabilities. Some thinkers seek innovative ways to describe future operations and to account for these changes in technology and structure. Professional military educators waver between teaching present realities and encouraging future visions. All of these authors, speakers, thinkers, and teachers exhort us, as the military at large, to think hard about anticipated changes and plan for their integration.

I developed this thesis because I perceived a void in applying these themes—technology, force reductions, and futuristic visions—to command and control and to related impacts for staff structures. I seek concrete application of these ideas, rather than more rhetoric on what might be . . . someday. This paper represents my effort to peer into our future and see possibilities. At a minimum, I hope to stir ideas, and at best, I wish to contribute ideas worthy of testing in some future joint task force (JTF) staff.

I remain indebted to my faculty research advisor, Dr. Michael Grumelli, for his candor, humor, and wise counsel throughout this project.

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# *Abstract*

Our military future will likely be radically different from our past. Consequently, military personnel can prepare for this future by investigating ways to adapt to novel challenges posed by new weapons, new theories, or new organizations.

This study explores the problem of how joint task force staffs should reorganize to improve future command and control to meet demands of the most likely future environment. The research methodology consisted of a literature search from a broad body of evidence. Sources included business literature, studies by organizations such as the Center for Naval Analyses, and research papers produced by other students.

Several key changes envisioned for the military provide a foundation for the project and introduce future operational and environmental complexities. These changes include emerging international and national trends such as increased military operations other than war and growing military pressures to shrink but remain effective. Another trend, the "revolution in military affairs," includes such aspects as a "system of systems" and "dominant battle space awareness." Additionally, Joint Vision 2010 offers a conceptual view of future battle-space activities that are portrayed as markedly different from today's activities. Against this backdrop of change, two primary reasons for using military staffs—information management and decision making—open a path to the heart of the paper and serve as a frame of reference for new organizational designs.

Two metaphors offer vivid conceptual staff images. First, the "spider plant" metaphor depicts a multifaceted organization with a core structure and many outlying satellite organizations, illustrating the potential for semiautonomous operations. Second, the "brain" metaphor captures the essence of relationships between key organizational elements and shows natural applications of decentralized decision making. The study concludes with a discussion of benefits gained through reorganization: faster, more responsive operations and leaner structures.

Both metaphors strive to define essential relationships between staff elements. The overarching theme involves finding areas where commanders and staffs can decentralize operations to improve speed and responsiveness. Often this decentralized approach is enabled by technology, however, the leaders must first be willing to let go of their control and learn to live in a complex environment—near the edge of chaos.

With a goal of stirring ideas for reorganization, this study applies contemporary vision statements and thoughts to command and control and related staff structures. It demonstrates potential to improve operations by developing innovative ways to visualize staff interactions. The time has come to move beyond rhetoric about the future and to develop useful ways to prepare. This work provides one step along the path of innovation.

# A Joint Task Force Staff Structure for the New Millennium

## Leaner, Faster, and More Responsive

Giulio Douhet, long acknowledged as an innovator and early airpower theorist, recognized a changing warfare environment and strove to meet its challenges. Douhet epitomizes a small minority of military professionals who are willing to invest their time contemplating what might be achieved. In 1947, Lt Gen James M. Gavin, former commanding general of the 82d Airborne Division, described the military majority: "We professional soldiers are traditionally laggard in facing and adopting changes, especially radical changes that upset proven methods and the ways in which we have been doing things for years past."[1] Emerging international and national changes will likely reach General Gavin's "radical" threshold. US military leaders must adopt new strategies to stay relevant—starting at the highest levels of command.

## Changes in Our Military Future

*Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.*

—Giulio Douhet

Three broad changes loom on the US military horizon: emerging international and national trends, the revolution in military affairs, and Joint Vision 2010. These changes are the result of the emerging operating environment, capabilities, and operational concepts affecting joint operations. Together they present a complex mosaic against which current practices must be gauged.

### Emerging International and National Trends

Speculation abounds for what the world's future holds. Widespread technology, rising nationalism, and growing economic and environmental interdependence all increase international complexities. These complexities often create

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situations in other regions requiring intervention. Military operations other than war (MOOTW) represent the most likely future interventions.

> With respect to missions of the future, it would appear that within the residual, state-centric international system, conflicts among major powers will be the exception. . . . Recent OOTW missions which have involved joint forces—in Somalia, Haiti, Rwanda, Bosnia, Liberia—contrast sharply with the focus of the Cold War era and the regional conflict in the Gulf that immediately followed it. But in fact they have been the normal missions of the Armed Forces save for the historical anomaly of the Cold War.[2]

In terms of national trends, two unrelated circumstances converged within the United States and resulted in increased military pressures that now affect operational considerations. First, the Soviet Union imploded, and with it went many military defense concerns of US citizens. These citizens now want greater fiscal focus on domestic issues. Second, the United States conducted a massive, incredibly rapid, and relatively casualty-free operation in the Middle East. Many citizens now perceive that all operations should be fast and clean. A continuing technology explosion further compounds these issues for the military.

**Revolution in Military Affairs**

"RMA [revolution in military affairs] proffers three key instruments of national power: the system of systems, extended information dominance, and information warfare."[3] The system of systems offers a glimpse at technology that facilitates change in military operations. Key components within the system of systems include position reporting, surveillance, and reconnaissance systems. Dominant battle-space awareness results from leveraging these capabilities to produce a common operational picture and from sharing information through networked communications. Military forces must harness these capabilities to achieve Joint Vision 2010.

**Joint Vision 2010**

"Joint Vision 2010 is the conceptual template for how America's Armed Forces will channel the vitality and innovation of our people and leverage technological opportuni-

ties to achieve new levels of effectiveness in joint warfight-ing."[4] These emerging concepts rest upon the promises of information superiority and full-spectrum dominance.

Information superiority serves as the foundation for full-spectrum dominance. Fused all-source intelligence and enhanced command and control permit forces to gain information superiority. Next, forces must confront two challenges in seeking full-spectrum dominance. First, they must embrace new technologies, and second, the individual war fighters must use initiative and creativity to maximize opportunities.

Adm Jay Johnson, chief of naval operations, stated, "The concepts outlined in Joint Vision 2010 can multiply our combat power. . . . But the real challenge is in changing our way of thinking."[5] In order to change contemporary thinking about joint task force (JTF) staff design, a crucial first step involves defining the future environment. Against a backdrop of pending military changes—emerging international and national trends, a revolution in military affairs, and Joint Vision 2010's new operational concepts—the staff's purpose and functions in this new future must be assessed.

## Need for Staffs

*Joint force commanders are provided staffs to assist them in the decisionmaking and execution process. The staff is an extension of the commander; its sole function is command sup-port, and its only authority is that which is delegated to it by the commander.*

—Joint Publication 0-2

As military operations have grown in complexity, staff structures have also grown until modern staffs representing monolithic organizations are bloated and distorted almost beyond recognition. Broad categories of modern staff elements include the "personal staff, special staff, and general or joint staff divisions."[6] For the United Task Force (UNITAF) portion of Somalia relief operations, the JTF Somalia staff table of organization reflects 906 billets![7] This size seems to contradict Lt Gen John H. Cushman's tenet which says, "Even as a commander directs modern war in all its complexity, he will want to keep his staff as small as possible, realizing that when minds are gifted he can get

his job done better with fewer."[8] Surely military personnel are no less gifted than General Cushman believes. At its most elemental level, the staff's purpose is twofold: to manage information on behalf of the commander and to assist the commander with decision-making functions. All other tasks tie to one of these purposes.

## Information Management

"A staff is an aid to command. It serves to ease the commander's workload by furnishing basic information and technical advice."[9] Situational awareness provided by the staff depends upon information—timely, accurate information. Staffs manage this information by processing it for the commander's use and by sharing it with others. Processing converts data into knowledge and awareness, and cannot be overemphasized. Vice Adm Arthur Cebrowski (director of US Navy space, information warfare, and command and control) and John Garstka (Joint Staff J-6 science and technical advisor) describe the benefit of information processing and link it to speed of command: "The force achieves information superiority, having a dramatically better awareness or understanding of the battlespace rather than simply more raw data. . . . The results that follow are the rapid foreclosure of enemy courses of action and the shock of closely coupled events."[10] Awareness occurs after staffs gather and analyze data.

**Gathering, Analysis, Presentation.** Staffs process data to save commanders time and to translate technical material into usable form. Commanders have little time to deal with raw data. The "cognitive hierarchy" shown in Joint Pub 6, *Doctrine for Command, Control, Communications, and Computers (C⁴) Systems Support to Joint Operations*, depicts information as data which has been processed in some way.[11] Staffs primarily process information specifically sought by the commander.

Commanders define information priorities to guide staff efforts. These priorities fall into two of three categories described as "Commander's Critical Information Requirements."[12] Information about the enemy or environment becomes a priority intelligence requirement. Information about friendly forces becomes a friendly force information re-

quirement. These requirements focus staff collection and processing efforts to expedite information management duties and conserve resources. Some information, if excessively detailed or technical, merits translation.

Staff members present information to the commander after rendering the material useful. This task may require describing information in layman's terms or depicting information graphically. A classic example involves weather reports. Rather than provide raw data or information about climatic conditions, weather reports present *USA Today*-style pictures with amplification about weather impacts to current operations. Staffs must use ingenuity like this to optimize information quality for commanders, and provide "understanding at a glance."

**Information Sharing/Flow.** The second aspect of information management involves disseminating information. While staffs predominantly manage information for their own commander, much information serves multiple organizations. Information sharing benefits others and can improve overall force efficiency. Too often, hierarchical organizations "control" information and impede access.[13] Information gains value when shared, and loses value when unnecessarily restricted. Shared information may travel in two directions within an organization, laterally or vertically.

Information must move laterally within organizations.[14] Typically adjacent or parallel elements represent similar structures —"sister units" —which may lack formal reporting relationships. Yet today, modern technology creates numerous options for lateral information sharing. Staffs must develop lateral information flow paths to optimize information resources. Additionally, lateral communications provide redundancy when vertical communications experience outages. In addition to "pure" lateral information flow, sophisticated networks may also incorporate diagonal information flow—simultaneously hierarchical and lateral.[15]

Vertical relationships symbolize "normal" information flow paths within typical military hierarchies. Staffs ensure that subordinates receive potentially useful information as well as keeping higher headquarters informed.[16] Any staff reorganization must accommodate both information management and flow concerns.

## Decision Making

A second principle staff task involves decision making. Although commanders remain ultimately responsible, they cannot realistically make all decisions. Consequently, commanders empower staff members to make decisions within certain limits. These decisions arise during both operational planning and execution.

**Planning.** Once operations commence, planning and execution occur simultaneously.[17] As a result, commanders cannot stay fully engaged in planning because they must attend to execution. Staffs plan based upon commander's intent, specific guidance, and their own situational awareness, and then translate approved plans into orders and action items.

Staffs play a key planning role by "developing basic decisions into adequate plans, and anticipating future needs and drafting tentative plans to meet them."[18] Typically, course of action development involves dynamic collaboration by many functional specialists to create an optimal plan. As perhaps the most critical staff function, course of action development represents the organization's bid to anticipate the future and prepare for success therein.

Course of action planners must remain closely associated with current operations personnel to maintain overall operational coherence and to capitalize on successes. Joint Vision 2010 describes how the separation between planners and executors may narrow, and perhaps disappear altogether: "Real-time information will likely drive parallel, not sequential, planning and real-time, not prearranged, decisionmaking."[19] Parallel planning may prove difficult for some whose sole experience involves linear planning efforts.

Planning staff responsibilities continue beyond plan approval and include "translating plans into orders, and transmitting them to subordinate commands."[20] In some cases, this documentation includes whole annexes and appendices to voluminous written orders. Technology now permits paperless information transfer that may speed delivery. Additionally, graphic information may be shared more easily today. Future technology may eliminate a need for written orders—video and audio tapes may store records of planning results recorded during confirmation briefs, and

electronic search and retrieval devices will lead a user to the desired plan section. In the interim, staff design must account for personnel who perform planning functions to include development and dissemination of orders.

**Execution.** During operations, commanders need assistance in monitoring the myriad of ongoing activities. Presently, a separate staff stands watch in an operations center and assists with decision-making activities.[21] Staff members usually represent functional specialties of elements engaged in operations. These staff members perform two basic functions for commanders. First, they monitor operations, making recommendations to modify plans and activities. Second, they coordinate support for subordinate units as requested.

Staffs monitor activities of subordinate and adjacent elements for the commander, specifically to maintain optimal situational awareness for decision making.[22] Monitoring in its least intrusive form occurs when elements conduct operations and submit routine reports that the monitor uses to maintain awareness of current status and activities. A more intrusive form occurs when a monitor demands information updates from subordinate elements despite having the latest updates already. Both the common operational picture and new information transfer techniques promise to improve situational awareness available to monitors.[23]

Coordination comprises the second function performed by operations center personnel. Staffs perform this function on behalf of subordinate elements, and it contributes to success of the force as a whole. In many cases, military organizations maintain parallel primary staff structures that coordinate within their narrow functional areas.[24] However, smaller staffs may lack expertise found on higher staffs and may request support. Subordinate units may also funnel requests for information support through the monitor, as the operations center likely has the best situational awareness. Any reorganization scheme must account for adequate monitors, although fewer would suffice in a decentralized decision-making environment.

Modern technology offers improvements that enhance staff functions of information management and decision making. These improvements could also provide personnel

savings. Computers enhance information gathering, analysis, and presentation. Communication capabilities and information transfer technologies provide means to share information throughout a network, potentially eliminating layers. Automated decision-making tools offer potential to reduce human intervention in selected situations. Greater situational awareness achieved through the "system of systems" presents potential personnel savings within operations centers as previously manual communication and plotting functions are automated. Additionally, networked telecommunications offer direct access from field units to specialists, possibly obviating the need for operations center personnel to coordinate support.

These advances could permit a greater span of control over widely dispersed forces by fewer personnel. However, Joint Vision 2010 clearly articulates the inherent challenge in bringing this about.

> In order to make optimum use of the technologies and operational concepts discussed earlier, we must carefully examine the traditional criteria governing span of control and organizational layers for services, commands, and defense agencies. We will need organizations and processes that are agile enough to exploit emerging technologies and respond to diverse threats and enemy capabilities. As we move forward, we may require further reductions in supervision and centralized direction.[25]

As a result, the key to exploiting the full potential of these new technologies lies in the willingness of commanders to relinquish control. These technologies achieve little if commanders only use them to modernize current hierarchical command and control methods. The future demands a new and creative organizational approach.

## Reengineering the Staff

> *The military staff must be adequately composed: it must contain the best brains in the fields of land, air and sea warfare, propaganda war, technology, economics, politics and also those who know the peoples' life.*
>
> —Gen Erich von Ludendorff

In his book *Seeing Organizational Patterns: A New Theory and Language of Organizational Design*, Robert Keidel asserts that "organizations are inherently triadic because

there are only three ways in which people can relate with-
out conflict to each other . . . autonomy, control, and
cooperation."[26]

He proposes that the "overwhelming tendency for man-
agement is to become obsessed with control" and suggests
that careful balance of the triadic variables offers a better
alternative to close control.[27] Figure 1 illustrates potential
characteristics of each variable and provides a means of
assessing which variables prove more desirable.
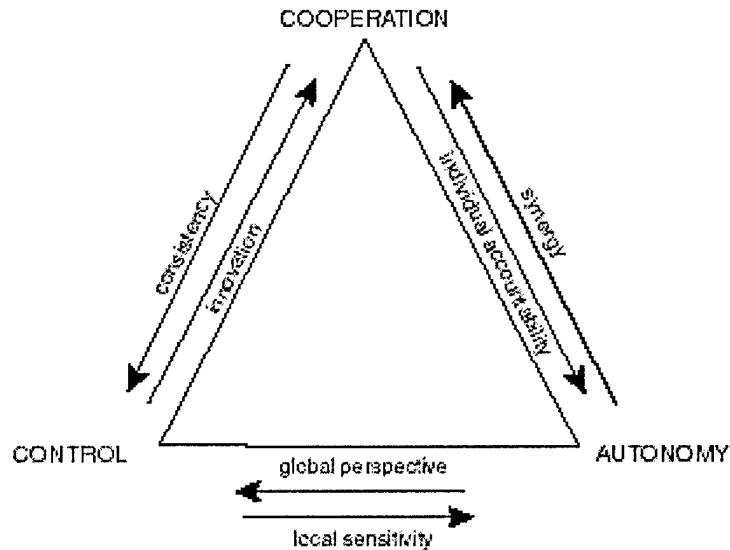


**Figure 1. Organizational Design Tradeoffs** (Robert W. Keidel,
*Seeing Organizational Patterns: A New Theory and Language of
Organizational Design* (San Francisco, Calif.: Berrett-Koehler
Publishers, 1995), 6.

Keidel then constructs multiple views of organizational
interaction using these three variables. In one example, he
defines organizational structures as a combination of three
elements: organizational charts, physical layouts, and in-
terdependence or work flow. He then relates these ele-
ments to the triadic variables. When these structural ele-

ments interact in a matrix with the triadic variables, a number of relationships emerge (table 1).

**Table 1**
**Organizational Structures**
**Superimposed on Triadic Variables**

|  | Autonomy | Control | Cooperation |
|---|---|---|---|
| *Organization Chart* (What is the form of our reporting relation?) | Flat/Clear | Steep/Clear | Flat/Amorphous |
| *Physical Layout* (What interaction does our physical design encourage?) | Independent Action | Programmed Interaction | Spontaneous Interaction |
| *Interdependence* (How does our work/information flow?) | Pooled | Sequential | Reciprocal |

**Source:** Keidel, 65–66.

For military operations, the ideal reporting relation is probably a "Flat/Clear" format because this relation permits rapid responses. However, present reporting chains resemble the "Steep/Clear" configuration of a control structure. Preferred physical layouts ought to encourage the "Spontaneous Interaction" shown under "Cooperation" to maximize contributions of all elements. Additionally, "Reciprocal" work and information flow between force elements represents an ideal arrangement for military planning and execution to capitalize on the speed of direct exchanges. To incorporate these ideas, the challenge becomes designing an organizational structure that balances the triadic variables to keep the favorable relationships identified here.

A further venture into contemporary literature provides numerous design choices. Among those, Gareth Morgan's works abound with wildly imaginative examples. Morgan stresses visualization and metaphors as a means to understand organizational interactions. He explains metaphor characteristics:

> Metaphor is often regarded just as a device for embellishing discourse, but its significance is much greater than this. The use of metaphor implies a way of thinking and a way of seeing that

pervade how we understand our world generally. . . . Metaphor is inherently paradoxical. It can create powerful insights that also become distortions, as the way of seeing created through a metaphor becomes a way of not seeing.[28]

A machine metaphor describes one traditional view of the military. Morgan describes how Frederick the Great adjusted his machine to improve efficiency: "And to ensure that the military machine was used as wisely as possible, he developed the distinction between advisory and command functions, freeing specialist advisors (staff) from the line of command to plan activities."[29] Today we continue to use specialist advisors in much the same way as historical military leaders like Frederick the Great and Napoléon Bonaparte. Technology, however, has advanced well beyond the imaginings of these leaders and offers fantastic opportunities for change. Two promising metaphors for change are the spider plant and the brain.

## Spider Plant Metaphor

The spider plant provides a very powerful image for a joint task force staff. The "parent plant" represents the operations centers (future and current). The "baby plants" or offspring represent all of the agencies, boards, and centers participating in the operation. Each offspring maintains ties to the parent via a cord representing some relationship.

**Parent Plant.** As noted, the parent plant symbolizes the core of the staff. Most often the core includes the future and current operations centers where near-term planning and execution monitoring take place. All other elements—the offspring—feed information to the core and receive support from it.

The parent plant defines relationships to and from offspring. Depending upon the nature of the offspring, these relationships may differ from one to another. The German military concept of *auftragstaktik* fits nicely here in that the parent defines the offspring's mission and end state through mission-type orders and commander's intent. The offspring endeavors to conduct its mission semiautonomously, while retaining a link to the parent for information

flow and support. Morgan describes his vision of this mu-
tual support:

> The understanding and agreements struck through this kind of
> "cord dialogue" are crucial in creating a shared frame of reference
> through which the "pot" and "offshoots" can operate in harmony
> without direct control. Whenever one engages in decentralized
> activity, there is always a danger of the decentralized units lurching
> in directions that violate the spirit or principles of the enterprise as
> a whole. The bureaucrat tries to protect against this by minimizing
> the space for maneuver through the creation of hierarchy, rules,
> and top-down management. The umbilical cord manager looks to
> shared understandings as a means of creating integration while
> maximizing the space, autonomy, and self-organizing capacities of
> the units being controlled. Minimum, rather than maximum,
> specifications and controls are the order of the day. [30]

The spider plant metaphor offers opportunities to establish
two desired aspects of Robert Keidel's theory: "Flat/Clear"
reporting relationships and "Reciprocal" information flow.

The parent provides essential support to offspring while
permitting them freedom of action. Rather than higher
headquarters perceiving itself as the supported element, a
spider plant metaphor reinforces the concept of a parent
caring for its offspring—ensuring they have needed sup-
port. Morgan suggests five potential arrangements between
the parent and offspring:

1. A shared sense of overall vision and values.
2. Agreement on accountabilities.
3. Resource flows in both directions.
4. Information systems.
5. Rewards.[31]

These links demonstrate the significant support aspect from
the parent to the offspring, as well as a unifying vision for
achieving responsiveness through *auftragstaktik*.

**Offspring.** Offspring of a JTF staff include agencies, boards,
and centers. In his research paper about shrinking the foot-
print of joint task force staffs, Maj Michael D. Wykoff reveals
the potential magnitude of these staff elements.

> Lieutenant General Anthony C. Zinni, commanding general of I
> Marine Expeditionary Force, U. S. Marine Corps, has identified
> about one hundred integrated staff cells that JTF commanders can
> select from and establish in theater for specialized tasks. An
> integrated staff cell is a functional organization as opposed to the
> traditional staff section that performs a group of related tasks. [32]

In addition to those integrated staff cells listed in the appendix, subordinate task forces command posts, service component command posts, and functional component operation centers also represent potential offspring. For coalition operations, this list becomes even larger. A Center for Naval Analyses study identified nine categories of elements, outside of the joint task force, with whom a joint force commander may need to coordinate:

1. Foreign militaries.

2. US government agencies (Department of State, Federal Management Agency).

3. Ad-hoc US government interagency teams.

4. US embassies and country teams.

5. Multinational organizations (United Nations, North Atlantic Treaty Organization, religious organizations).

6. Foreign governments/agencies.

7. Nongovernment organizations (International Red Cross, Doctors without Borders).

8. Corporations.

9. Nongovernment local leaders (tribe, warlord).[33]

The sheer size of this organization demands a new way of thinking about military operations and control, especially when leveraged by technology. The multitude of interacting elements demands those cooperative aspects in Keidel's theory regarding "Spontaneous Interaction" and "Reciprocal" information flow.

The complexity of modern operations, with potentially one hundred offspring contributing to a mission, creates a broad span of control requirement for the joint force commander. Often clumping elements under principal staff directorates reduces this burden. This clumping technique proved ineffective for several recent MOOTW operations: JTF Sea Angel (Bangladesh) personnel reported blurring between J-2 (intelligence) and J-3 (operations) functions;[34] JTF Gitmo (Guantanamo Bay, Cuba) personnel revealed blurring between J-3 and J-4 (logistics) functions and difficulty defining J-2 tasks;[35] and JTF Provide Promise (Bosnia) personnel also identified blurring of responsibility between the J-2 and J-3.[36] Additionally, two functional component commands—Strategic Command (STRATCOM) and Transportation Command (TRANSCOM) presently

combine the J-3 and J-4 into a single department. [37] These examples of functional overlap and ambiguities spark a question about continued utility of the conventional staff model.

Whether offspring monitoring occurs through the joint operations center or by principal staff cells, one might conclude that contemporary operations ought to be decentralized. With so many elements, only decentralization provides flexibility to react quickly and exploit fleeting opportunities. Joint Vision 2010 suggests this possibility:

> The implications of improved systems integration are both profound and complex. New technologies will allow increased capability at lower echelons to control more lethal forces over larger areas, thus leveraging skills and initiative of individuals and small units. These capabilities could empower a degree of independent maneuver, planning, and coordination at lower echelons, which were normally exercised by more senior commanders in the past. [38]

In turn, decentralization may permit joint force commanders to field smaller staff elements, as the demands upon the staff to "control" operations lessen.

One requirement levied through decentralized operations arises as a need for networked information exchange between operational elements, support elements, and staff elements. Morgan describes two means of making synergy and integration occur between offspring. One method involves writing requirements into the cord relationships. Under Keidel's organizational structure theory in table 1, this notion of writing requirements appears to fit a "Control" technique leading to "Programmed Interaction" with "Sequential" work and information flow. These relationships were rejected earlier in favor of the "Cooperation" technique which allows "Spontaneous Interaction" and "Reciprocal" work and information flow. A "bumblebee" metaphor supports the latter technique, permitting free information flow and interaction.

One practical example of a "bumblebee" is a liaison officer. Because the liaison works for the sending unit, that unit can also require the liaison to coordinate with multiple agencies, moving from unit to unit (plant to plant) in the operations area. In another example, support flights from the United States to the theater may perform a bumblebee function by carrying essential materiel and person-

nel. Military forces seem predisposed to carry as many people and things as possible into the theater. This attitude proves wasteful. In the future, a first response ought to involve liaison bumblebees and electronic connectivity for all elements that need not physically reside in theater.

The spider plant metaphor offers an example of picturing the joint task force as a collection of discrete elements. By viewing each element and its relationship to the parent plant as a separate and unique occurrence, planners may recognize ways to streamline the staff by leaving some elements at home. Defining these relationships also helps determine missions for each discrete element, which should allow leaders to better decide how many personnel should deploy rather than the typical response of taking everyone and sorting out the situation on the ground. Moving away from the spider plant, a quite different way to view the joint task force involves using a "brain" analogy.

## Brain Metaphor

In another metaphor to describe a modern organization, Morgan reports, "Organizations are information systems. They are communication systems. And they are decision-making systems. We can thus go a long way toward understanding them as information processing brains."[39] This particular metaphor proves useful in assessing relationships between the joint task force core staff and other elements.

**Two Hemispheres.** The brain's two hemispheres share one shell. They perform complementary functions. If the corpus callosum that joins the hemispheres is severed, the brain continues to perform but integrated functioning is lost.[40] For example, language functions typically reside in the left hemisphere. A picture presented to the right eye will cross to the left hemisphere and can be verbally identified. A picture presented to the left eye crosses into the right hemisphere, which is language deficient. Upon questioning, the subject will not be able to identify the object presented to the left eye. This example illustrates a potential pitfall in separating the two hemispheres of the core staff, the future and current operations sections. Assume that situational awareness represents language capacity.

The current operations section acts as the left hemisphere and controls situational awareness. Important information presented to the future operations section may mean nothing because that section lacks capacity for situational awareness when separated from current operations.

At a minimum, future operations and current operations staffs should be located, as far as possible, within one open facility. Joint Vision 2010 suggests one driver for this arrangement: "Real-time information will likely drive parallel, not sequential, planning and real-time, not prearranged, decisionmaking."[41] Only when these two hemispheres of the joint task force brain fully integrate can modern joint task forces realize the synergy afforded by the revolution in military affairs. Ultimately, if the Joint Vision 2010 prediction comes true, these two sections will merge into one unit.

Under a three-tiered planning and execution model, future plans conducts midrange to far-term planning, future operations conducts near-term planning, and current operations monitors execution and conducts reactive planning. This model epitomizes linear planning and execution. To capitalize on technological advances and promises of faster tempo operations, this linearity must change. One means to initiate this change is through collocation of future and current operations. Future operations planners must maintain up-to-the-minute situational awareness to produce viable plans that seamlessly meld with current operations.

An inverse relationship exists for the current operations staff. These personnel, who conduct reactive planning during operations, benefit from insight about the future operations under consideration. This insight may permit reactive planning to lead the operations into a natural blending with future operations plans.

The present, separated physical design leads to "Control" characterizations under Keidel's theory, which include "Programmed Interactions" and "Sequential" information flows. The desired relationship, "Spontaneous Interaction" with "Reciprocal" work and information flows, occurs when both hemispheres habitually share one shell.

**Nervous Systems.** James Schneider, professor of military theory at the School of Advanced Military Studies, observed in a recent article that "command and staff processes are basically poor models of the brain and nervous system."[42] In the human body, the brain acts through the central and peripheral nervous systems. These systems receive information from the periphery and act upon it. When compared to a military organization, the external elements beyond the future and current operations centers (brain) represent the input agents sending signals to and receiving information from the brain. As noted with the spider plant metaphor, multitudes of external elements exist in contemporary operations.

The brain possesses a capacity to rapidly signal the body through a vast network of nerve cells. Emergencies often demand flash responses from reflexes throughout the body. In these cases, critical information hastens to all locations. Modern information technology provides capability to achieve that same effect throughout a dispersed organization.

Morgan describes this capability using a hologram analogy: "Information technology also has holographic characteristics in that it has the capacity to spread information and intelligence throughout a system so that people can be integrated even though they are far apart, because they possess the knowledge and intelligence to act on behalf of the whole."[43] Organizations networked by information technologies can mimic the nervous system and develop capacities to respond quickly and with unity of effort.

One limitation to implementing the brain model lies in hierarchical mind-sets. Rapid, flexible response occurs only when information travels directly from the "senses" to the location most needing the information. Conventional staff structures potentially limit information sharing by slowing information flow or blocking it altogether.

A related issue deals with having the authority to respond when information reveals a need to act quickly. In the nervous system, certain stimuli cause immediate responses, before the brain even processes the signal. Pain reactions offer one example. Military organizations could benefit from adopting a similar technique—decentralized

decision making. Such responses capitalize upon fleeting opportunities, achieving the promise of the revolution in military affairs.

Professor Schneider discusses the potential for a force to act autonomously: "A joint force . . . may suffer complete cybernetic collapse—the analog to a broken neck—but spontaneously reorganize at lower echelons and continue with its mission. The efficacy of the German idea of *auftrag-staktik* is based on the self-organizing ability of subordinate leaders and units."[44] Military decentralization, based upon a mission statement, commander's intent, and end state, permits speed and flexibility and also limits dependence upon critical nodes.

Military leaders often shy away from decentralization because such operations tend to become disorderly—and the military abhors disorder. Complexity theory suggests that order emerges from seeming chaos if we look for it. Keidel lends perspective to this concern by relating his triadic variables—control, cooperation, and order—to chaos and complexity. "In short, complexity theory argues that there is a third realm, complexity, or the 'edge of chaos' that represents a transition state between order and chaos. . . . In terms of triangular design, complexity parallels cooperation, order parallels control, and chaos parallels autonomy."[45] Decentralized operations, favoring cooperation over pure autonomy, hover at the edge of chaos. While staffs strive to hold operations closer to complexity than chaos, they should remain flexible in cases where autonomy becomes necessary, recognizing that elements will self-organize to meet new demands.

Morgan's metaphors offer powerful tools with which to examine organizations and seek fresh understandings of their dynamics. Two metaphors—the spider plant and brain—provide value in assessing relationships between a core element and many peripheral elements. At the heart of this discussion lies the promise of information technologies, upon which staff interactions may move to new levels of cooperation.

Creativity remains essential for change and improvement. In *Classics of Organizational Theory*, James Champy and Michael Hammer describe the modernization process:

"Reengineering is about innovation. It is about exploiting the latest capabilities of technology to achieve entirely new goals. One of the hardest parts of reengineering lies in recognizing the new unfamiliar capabilities of technology instead of its familiar ones."[46] Military reorganization, using the spider plant and brain metaphors and embracing enabling technologies, demonstrates essential creativity and yields two benefits for future war fighting: faster, more responsive operations and leaner structures.

## Reorganization Benefits

*With exponentially exploding technology in weapons and our ability to process information, the ability to optimize the command and control structure will take on even greater importance. Herein lies one of the great challenges we face in the continuing development of joint doctrine. We must optimize a commander's ability to focus a growing resource base while enhancing his ability to deal with an increasingly complex set of tasks and conditions.*

—Gen C. C. Krulak

Reorganizing JTF staffs with a more direct relationship between elements offers several benefits. First, operations become faster when streamlining eliminates layers made obsolete through technology and new operational concepts. Second, leaner structures enhance force protection by lowering the number of personnel, agencies, boards, and centers (targets) in a theater. Finally, the restructured staff permits decentralized decision making and information sharing needed for Joint Vision 2010.

### Faster, More Responsive Operations

Information technologies promise faster and more responsive operations. This effect will follow from decentralized decision making resulting from such capabilities as cooperative engagement targeting, sensor-to-shooter reporting, in-transit visibility, and so on. These capabilities eliminate the need for some layers presently arrayed in the military command and control structure (for example, control and reporting centers or intermediate logistics nodes). Additionally, networked information sharing will permit quicker

operational support through near-real-time agency inter-
actions.

**Decentralized Decision Making.** Increasing volumes of
current military literature call for decentralized decision
making. Modern military thinking emphasizes getting in-
side an enemy's decision cycle (Col John R. Boyd's ob-
serve, orient, decide, act loop[47]) through faster tempo. Hi-
erarchical organizations cannot achieve decision speeds
necessary to achieve this goal, especially in very dynamic
and chaotic MOOTW scenarios. Two distinguished US Mili-
tary Academy personnel, Lt Gen Howard Graves (former
superintendent) and Don Snider (Olin Professor of Na-
tional Security Studies), commented on this issue in such
MOOTW missions as Somalia: "Most OOTW missions have
also called for decentralized mission execution. This dis-
persion requires greater political-military sophistication in
younger officers, to include direct contact with the media,
nongovernmental organizations, and foreign governments,
as well as coping with the inherent ambiguities and com-
plexities of such international operations."[48]

Using the spider plant metaphor, offspring require author-
ity to act without need for consultation with the parent
plant. Predefined arrangements, such as rules of engage-
ment, a shared sense of overall vision and values, and
agreement on accountabilities, provide the basis for at-the-
scene decision making. Unpredictable situations like MOOTW
require maximum latitude for military personnel in contact
with the local population. In an environment of weak or
nonexistent government and law enforcement, military per-
sonnel need freedom for rapid response in potential caul-
drons of volatile activity. Freedom of action permits speed
and flexibility to achieve Joint Vision 2010 goals of domi-
nant maneuver and precision engagement.

Through the improved situational awareness provided
by the common operating picture, field units can better
locate gaps or weaknesses and exploit dominant maneu-
ver.[49] This maneuver may occur in a classic war-fighting
sense to interject forces between adversaries in a peace
operation or to act in a supporting role for humanitarian
assistance relief distribution. In dispersed operations like
MOOTW, many military elements move in a large area.

Each element needs decision-making independence for dominant maneuver. Intervening agencies between units and an operations center add little value for rapid operations.

Likewise, a force seeking to engage a fleeting target requires instant response. Direct communication from sensor to shooter proves essential for precision engagement of mobile targets. Intervening command layers slow the transfer of perishable information. For targets of opportunity encountered by the force, decentralized decision making permits rapid and flexible engagement.

**Information Decentralization.** Besides decision making, commanders must also decentralize information. The value in this arrangement was previously discussed for dominant maneuver and precision engagement. However, information decentralization also enables the other two Joint Vision 2010 concepts: focused logistics and full-dimensional protection.

Focused logistics benefit from networked users and suppliers. Wal-Mart provides a superb example of this concept within the civilian sector.

> Wal-Mart has developed a significant competitive edge by reducing its cost of sales to two to three percentage points below the industry average. Wal-Mart was able to achieve this edge by making the shift to network-centric operations and translating information superiority into competitive advantage. Realizing that it had grown past the point where it could cost-effectively synchronize supply and demand from the top down, the company over time set up a sophisticated operational architecture—consisting of a sensory capability and a transaction grid—to generate a higher level of awareness within its retail ecosystem. Point-of-sale scanners—part of the sensor grid—collect information on the 90 million transactions that take place each week. This information is shared with suppliers in near real time, so they are able to better control production and distribution, as well as manage their own supply chains. . . . This degree of self-synchronization emerged from the co-evolution of organization and process. [50]

Military forces could benefit from such a direct, responsive support system. An essential component lies in decentralized, networked information throughout the operations area.

Military forces today place increased emphasis on force protection. Success requires both decentralized information and decision making. All forces engaged in protection operations need the most current situational awareness, as well as direct cueing from sensors whenever possible.

Considering air-to-surface and surface-to-surface missile speeds, force-protection forces must operate with a high degree of autonomy. Excessive layering in this mission could result in dead Americans and mission failure. James Champy and Michael Hammer, authors of an article about technology's enabling role in reorganization, offer one view: "The costs of hierarchical decisionmaking, however, are now too high to bear. Modern database technology allows information previously available only to management to be widely accessible."[51]

Military forces must capitalize on the speed and responsiveness generated by information technology. Hierarchies and "stove-pipes" prevent realization of Joint Vision 2010. Conversely, operational benefits of reorganizing joint task force staffs using the spider plant and brain metaphors results in faster, more responsive operations.

## Leaner Structures

Another benefit of joint task force staff reorganization emerges as leaner structures. Deploying fewer personnel to a theater potentially reduces risk, assuming that personnel left at home are not the force-protection or security elements. Smaller "footprints" conserve resources all around and also reduce personnel tempo. Leaner structures occur by eliminating elements without direct troop or asset control, using reach-back capability for routine support, and eliminating intervening command and control agencies.

**Reduced Layers.** "Organizations are rarely established as ends in themselves. They are instruments created to achieve other ends. This is reflected in the origins of the word organization, which derives from the Greek *organon*, meaning a tool or instrument."[52] One of the great military challenges lies in eliminating unnecessary command and staff layers. The military must grapple with such very real issues as how to train and evaluate commanders without command opportunities at various ranks. Additionally, the military places great value in "real-world" operational experience—which tends to unnaturally swell staff sizes. To reorganize successfully, the military must escape the bonds of its culture, and make hard choices about exactly what staff structure best meets future needs.

Technology permits increased span of control and wider coordination between elements, thereby obviating a need for any element that lacks a direct role in operations. The most obvious place to test this theory is within land forces. These forces use many layers to reduce span of control to between three and five elements per command level. Such hierarchical layering will likely be detrimental for future rapid decision making, and would be pointless for information sharing in a highly networked environment. The civilian sector has already noted this by-product of advanced technology: "Information technology, used imaginatively, has eliminated the need for separate, fully formed field units with their own overheads. . . . Wireless data communication goes further and begins to eliminate the need for field offices entirely."[53]

Telecommunications offer reach-back capabilities from theater to a home station. Support and services can now be coordinated without carrying an entire organization to the operations area. Gareth Morgan describes this environment:

> As information technology catapults us into the reality of an Einsteinian world where old structures and forms of organization dissolve and at times become almost invisible, the old approach no longer works. Through the use of telephone, fax, electronic mail, computers, video, and other information technology, people and their organizations are becoming disembodied. They can act as if they are completely connected while remaining far apart. They can have an instantaneous global presence. They can transcend traditional barriers of space and time, continually creating and recreating themselves through changing networks of interconnections based on "real time" communication.[54]

Using the spider plant metaphor, a joint task force could "create and recreate" itself in each phase of an operation, based upon the capabilities and services it needed then. From the outset, some offspring would collocate with the parent plant, but others—perhaps many others—could remain home. Regardless of location, the cord arrangements would still exist between elements. This vision demands trust from commanders, a belief that elements not under physical control will respond with the same urgency as if deployed.

**Fewer Command and Control Agencies.** In addition to savings from eliminated headquarters and nondeployed

staff elements, further savings may result from reduced command and control ($C^2$) agencies. Presently, $C^2$ agencies provide functional planning, supervision, and assistance to joint task force elements. Aviation command and control provides an example. Aircraft flying in support of ground forces may be required to communicate with as many as four agencies en route to the terminal controller.[55] The pilot first checks out with his local organization as he departs the field. Then he clears through air traffic control until away from the traffic pattern. Next, the pilot clears with the local air defense/air control agency that ensures safe passage through friendly air defenses. Finally, the pilot talks to the air support coordinating agency, which then directs him to a terminal controller. No single agency provides overall command and control of air operations; each is subordinate to a command center. Military forces leveraging new technologies ought to be able to combine these agencies and streamline operations significantly. Several spider plant offspring graft together to form a new, smaller offspring. Subsequent savings also reduce risk by reducing footprint and lowering personnel tempo and cost. Logistics organizations may realize similar savings with capabilities like total asset visibility.

Additional structure savings may accrue from sensor-to-shooter technologies that directly link critical elements.[56] In situations where fairly clear rules of engagement exist or where specific threats pose little danger, certain agencies may not be needed. For example, in a low aircraft-threat environment, agencies that oversee ground-based air defense units may not be needed. Combat air patrols may provide adequate defense from "air-breathing" threats. Thus, ground-based air defenses may provide only missile defense, which presents much clearer engagement criteria or rules of engagement and therefore eliminates a need for a supervising coordination agency. This modified structure reduces footprint and conserves resources.

Technology advances such as the common operational picture may also eliminate some redundant $C^2$ agencies by allowing all services to share a picture. Previously, some agencies deployed in order to translate computerized information for other agencies. As an example, the Marine tac-

tical air operations center provides a capability to translate a data link—NATO Link 1—to and from forces that lack the proper equipment. Whether or not the agency was needed from a command and control perspective, it had deployed simply to serve as a data-link conduit.[57] The common operational picture will permit timely and direct situational awareness for all, rather than only those with highly specialized equipment.

Many benefits accrue from redesigning the JTF staff. Rising highest among these is the capability to conduct faster, more responsive operations—both for combat and for support. In fact, only by reorganizing will joint task forces achieve the objectives set forth in Joint Vision 2010. An additional benefit is risk reduction through fewer assets deployed to theater. Fewer deploying forces may also translate to reduced personnel tempo. A smaller footprint in theater results in resource conservation and this translates to fiscal savings as well. Finally, reducing deployed forces enhances the military's ability to respond to multiple, simultaneous operations.

Abundant reasons exist to redesign joint task force staffs. The challenge now arises in convincing the military "old guard" to relinquish many long-held conceptions and cultural norms. "Admiral William A. Owens, the former Vice Chairman, indicated that 'the problem with deep, fast, and rampant innovation is not getting people to accept the new but to relinquish the old.' "[58] The military must move beyond rhetoric about change and implement it. Restructuring joint task force staffs provides a great starting point.

## Conclusion

*New conditions require . . . new and imaginative methods. Wars are never won in the past.*

—Gen Douglas MacArthur

Five recommendations emerge from this study. First, the unified commanders must demand that services exploit information technologies to provide reliable reachback capabilities. With such capabilities, serious discussion and experimentation can begin with respect to which staff elements really need to deploy. Some staff elements

can provide service from the United States, and this arrangement ought to become the normal situation. Benefits include risk reduction and cost reduction —both monetary and personnel.

Second, unified commanders must insist that joint training include decentralized operations in order to develop confidence among leaders at all levels. Senior leadership must begin to trust junior leaders to conduct successful operations without close control and monitoring. Junior leaders must develop self-confidence in an environment of decreased control, and they must learn to open communication upwards without fears of overcontrol by seniors. This change requires cultural shifts from "control" and "order" to "cooperation" and "complexity." Without this change, Joint Vision 2010 remains a dream without substance.

Third, unified commanders must compel services to invest in information technologies until information networks span the battle space. Decentralized operations will lose potential without the capability to share a common operational picture. Additionally, joint training in lateral information sharing must occur regularly. Only when all forces are interconnected can true synergy and cooperation occur.

Fourth, unified commanders must insist that streamlining of military structures occurs. This aspect likely poses the most painful and contentious issue for services to undertake. Hierarchical structures are inefficient for the environment envisioned and must be eliminated.

Fifth, unified commanders must train with planning and execution cells occupying the same spaces and operating as one staff. With increased information flows and the common operational picture, parallel planning and execution can become a reality. This real-time decision making will be needed to meet goals of dominant maneuver and precision engagement.

"If the motives for change are present, and if failing to implement effective responses to change risks national disaster, why do militaries not implement effective change and how much of this failure is the responsibility of commanders?"[59] As US war fighters, unified commanders must move Joint Vision 2010 from concept to practice. This nation can no longer afford the status quo. The time will

never be better to redesign joint task force staffs for a new millennium.

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**Appendix**
**JTF Integrated Staff Cells**

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## PERSONNEL

Joint Reception Center
EPW Management Board
Joint Awards Board
MWR Commission

## INTELLIGENCE

Joint Intelligence Center
or Support Element
National Intelligence Support Team
Joint Collections Board/SARC
Joint Crypto Resource Board
Joint Reserve Intelligence Center
Joint Interrogation Facility
Joint Document Exploitation Center

## OPERATIONS

Force Fires Planning/Coordination Center
Joint Targeting Coordination Board
Combat Operations Center
Future Operations Cell
Rear Area Operations Center
Civil-Military Operations Center
Security Assessment Team
Doctrine and Documentation Cell
JULLS Team
Special Operations Team
Joint Search and Rescue Center

## LOGISTICS

Joint Movement Control Center
Joint Aviation Log Support Board
Joint Material Priority Allocation Board
Joint Mortuary Affairs Board
Joint Contracting Board
Joint Petroleum Board
Joint Facilities Utilization Board
Joint Logistics Coordination Board
Logistics Readiness Center

*PLANS*

Future Plans Cell
Operational Planning Team
Political-Military Group

*COMMAND AND CONTROL*

Command Coordination Cell
Joint Communication Control Center

*MEDICAL*

Joint Disease Control Board
Joint Medical Control Board
Health Service Support Board
Joint Blood Program Office
Joint Patient Movement Request Center

*OTHER*

ROE Commission
Joint Information Bureau
Information Management Technical Advisory/Analysis
Board
Joint Visitors Bureau

34

# Definitions of Terms Used in
# Joint Vision 2010

**Dominant maneuver.** Dominant maneuver will be the multidimensional application of information, engagement, and mobility capabilities to position and employ widely dispersed joint land, sea, air, and space forces to accomplish assigned operational tasks. Dominant maneuver will allow our forces to gain a decisive advantage by controlling the breadth, depth, and height of the battle space.

**Precision engagement.** Precision engagement will consist of a system of systems that enables our forces to locate an objective or target, provide responsive command and control, generate the desired effect, assess the level of success, and retain the flexibility to reengage with precision when required. Even from extended ranges, precision engagement will allow us to shape battle space, enhancing the protection of our forces.

**Full-dimensional protection.** The primary prerequisite for full-dimensional protection will be control of the battlespace to ensure forces can maintain freedom of action during deployment, maneuver, and engagement, while providing multilayered defenses for forces and facilities at all levels. Full-dimensional protection will enable effective employment of our forces while degrading opportunities for an enemy. It will be essential, in most cases, for gaining and maintaining the initiative required to execute decisive operations. The concept will be proactive, incorporating both offensive and defensive actions that may extend well into areas of enemy operations.

**Focused logistics.** Focused logistics will be the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical levels of operations. It will be fully adaptive to the needs of our increasingly dispersed and mobile forces, providing support in hours or days versus weeks. Focused

logistics will enable joint forces of the future to be more mobile, versatile, and projectable from anywhere in the world.

**Full-spectrum dominance.** Each of these operational concepts will reinforce the others and will allow us to achieve massed effects in warfare from more dispersed forces—that is, taken together these four new concepts will enable us to dominate the full range of military operations from humanitarian assistance, through peace operations, up to and into the highest intensity conflict.

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