Joint Vision 2020

America's Military—Preparing for Tomorrow

CJCS Vision . . .

Dedicated individuals and innovative organizations transforming the joint force for the 21st century to achieve full spectrum dominance:

Persuasive in peace

Decisive in war

Preeminent in any form of conflict

The U.S. military today is a force of superbly trained men and women who are ready to deliver victory for our Nation. In support of the objectives of our national security strategy, it is routinely employed to shape the international security environment and stands ready to respond across the full range of potential military operations. But the focus of this document is the third element of our strategic approach—the need to prepare now for an uncertain future.

Joint Vision 2020 builds upon and extends the conceptual template established by *Joint Vision 2010* to guide the continuing transformation of the Armed Forces. The primary purpose of those forces has been and will be to fight and win the Nation's wars. The overall goal of the transformation described in this document is the creation of a force that is dominant across the full spectrum of military operations—persuasive in peace, decisive in war, preeminent in any form of conflict.

In 2020, the Nation will face a wide range of interests, opportunities, and challenges and will require a military that can both win wars and contribute to peace. The global interests and responsibilities of the United States will endure, and there is no indication that threats to those interests and responsibilities, or to our allies, will disappear. The strategic concepts of decisive force, power projection, overseas presence, and strategic agility will continue to govern our efforts to fulfill those responsibilities and meet the challenges of the future. This document describes the operational concepts necessary to do so.

If the Armed Forces are to be faster, more lethal, and more precise in 2020 than they are today, we must continue to invest in and develop new military capabilities. This vision describes the ongoing transformation to those new capabilities. As first explained in *Joint Vision 2010*, and dependent upon realizing the potential of the information revolution, today's capabilities for maneuver, strike, logistics, and protection will become dominant maneuver, precision engagement, focused logistics, and full dimensional protection.

The joint force, because of its flexibility and responsiveness, will remain the key to operational success in the future. The integration of core competencies provided by the individual services is essential to the joint team, and the employment of the capabilities of the total force (active, Reserve, National Guard, and civilian members) increases the options for the commander and complicates the choices of our opponents. To build the most effective force for 2020, we must be fully joint: intellectually, operationally, organizationally, doctrinally, and technically.

This vision is centered on the joint force in 2020. The date defines a general analytical focus rather than serving as a definitive estimate or deadline. The document does not describe counters to specific threats, nor does it enumerate weapon, communication, or other systems we will develop or purchase. Rather, its purpose is to describe in broad terms the human talent—the professional, well-trained, and ready force—and operational capabilities that will be required for the joint force to succeed across the full range of military operations and accomplish its mission in 2020 and beyond. In describing those capabilities, the vision provides a vector for the wide-ranging program of exercises and experimentation being conducted by the services and combatant commands and the continuing evolution of the joint force. Based on the joint vision implementation program, many capabilities will

U.S. Air Force (Val Gempis)

be operational well before 2020, while others will continue to be explored and developed through exercises and experimentation.

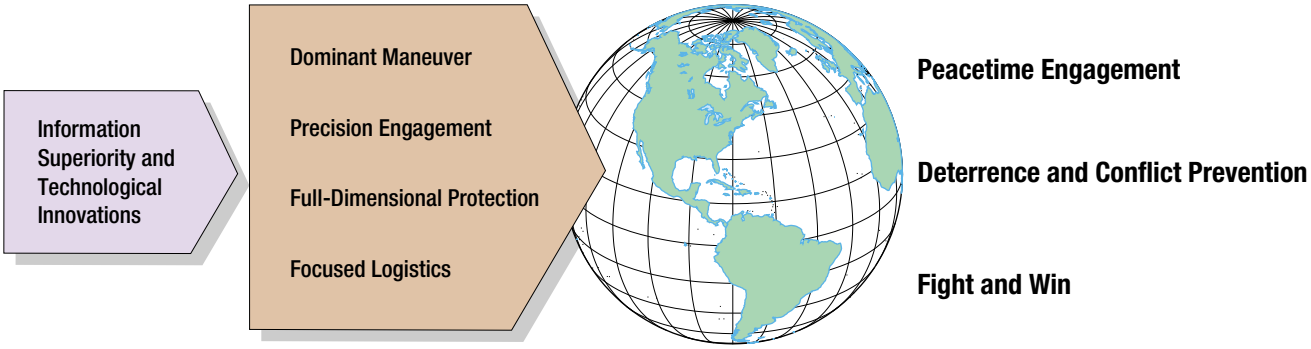
The overarching focus of this vision is full spectrum dominance—achieved through the interdependent application of dominant maneuver, precision engagement, focused logistics, and full dimensional protection. Attaining that goal requires the steady infusion of new technology and modernization and replacement of equipment. However, material superiority alone is not sufficient. Of greater importance is the development of doctrine, organizations, training and education, leaders, and people that effectively take advantage of the technology.

The evolution of these elements over the next two decades will be strongly influenced by two factors. First, the continued development and proliferation of information technologies will substantially change the conduct of military operations. These changes in the information environment make information superiority a key enabler of the transformation of the operational capabilities of the joint force and the evolution of joint command and control. Second, the Armed Forces will continue to rely on a capacity for intellectual and technical innovation. The pace of technological change, especially as it fuels changes in the strategic environment, will place a premium on our ability to foster innovation in our people and organizations across the entire range of joint operations. The overall vision of the capabilities we will require in 2020, as introduced above, rests on our assessment of the strategic context in which our forces will operate.

STRATEGIC CONTEXT

Three aspects of the world of 2020 have significant implications for the Armed Forces. First, the United States will continue to have global interests and be engaged with a variety of regional actors. Transportation, communications, and information technology will continue to evolve and foster expanded economic ties and awareness of international events. Our security and economic interests, as well as our political values, will provide the impetus for engagement with international partners. The joint force of 2020 must be prepared to win across the full range of military operations in any part of the world, to operate with multinational forces, and to coordinate military operations, as necessary, with government agencies and international organizations.

Figure 1. Full Spectrum Dominance



982d Signal Company (James V. Dowden, Jr)

Second, potential adversaries will have access to the global commercial industrial base and much of the same technology as the U.S. military. We will not necessarily sustain a wide technological advantage over our adversaries in all areas. Increased availability of commercial satellites, digital communications, and the public Internet all give adversaries new capabilities at a relatively low cost. We should not expect opponents in 2020 to fight with strictly industrial age tools. Our advantage must therefore come from leaders, people, doctrine, organizations, and training that enable us to take advantage of technology to achieve superior warfighting effectiveness.

Third, we should expect potential adversaries to adapt as our capabilities evolve. We have superior conventional warfighting capabilities and effective nuclear deterrence today, but this favorable military balance is not static. In the face of such strong capabilities, the appeal of asymmetric approaches and the focus on the development of niche capabilities will increase. By developing and using approaches that avoid U.S. strengths and exploit potential vulnerabilities using significantly different methods of operation, adversaries will attempt to create conditions that effectively delay, deter, or counter the application of U.S. military capabilities.

The potential of such asymmetric approaches is perhaps the most serious danger the United States faces in the immediate future—and this danger includes long-range ballistic missiles and other direct threats to U.S. citizens and territory. The asymmetric methods and objectives of an adversary are often far more important than the relative technological imbalance, and the psychological impact of an attack might far outweigh the actual physical damage inflicted. An adversary may pursue an asymmetric advantage on the tactical, operational, or strategic level by identifying key vulnerabilities and devising asymmetric concepts and capabilities to strike or exploit them. To complicate matters, our adversaries may pursue a combination of asymmetries, or the United States may face a number of adversaries who, in combination, create an asymmetric threat. These asymmetric threats are dynamic and subject to change, and the Armed Forces must maintain the capabilities necessary to deter, defend against, and defeat any adversary who chooses such an approach. To meet the challenges of the strategic environment in 2020, the joint force must be able to achieve full spectrum dominance.

FULL SPECTRUM DOMINANCE

The ultimate goal of our military force is to accomplish the objectives directed by the National Command Authorities. For the joint force of the future, this goal will be achieved through full spectrum dominance—the ability of U.S. forces, operating unilaterally or in combination with multinational and interagency partners, to defeat any adversary and control any situation across the full range of military operations.

The full range of operations includes maintaining a posture of strategic deterrence. It includes theater engagement and presence activities. It includes conflict involving employment of strategic forces and weapons of mass destruction, major theater wars, regional conflicts, and smaller-scale contingencies. It also includes those ambiguous situations residing between peace and war, such as peacekeeping and peace enforcement operations, as well as noncombat humanitarian relief operations and support to domestic authorities.

The label *full spectrum dominance* implies that U.S. forces are able to conduct prompt, sustained, and synchronized operations with combinations of forces tailored to specific situations and with access to and freedom to operate in all domains—land, sea, air, space, and information. Additionally, given the global nature of our interests and obligations, the United States must maintain its overseas presence forces and the ability to rapidly project power worldwide in order to achieve full spectrum dominance.

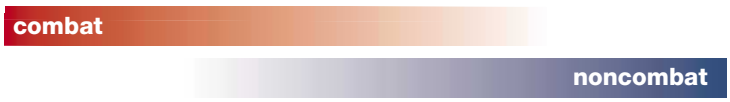
Sources of Friction

- effects of danger and exertion
- uncertainty and chance
- unpredictable actions of other actors
- frailties of machines and information
- human frailties.

Achieving full spectrum dominance means the joint force will fulfill its primary purpose—victory in war—as well as achieving success across the full range of operations, but it does not mean that we will win without cost or difficulty. Conflict results in casualties despite our best efforts to minimize them and will continue to do so when the force has achieved full spectrum dominance. Additionally, friction is inherent in military operations. The joint force of 2020 will seek to create a "frictional imbalance" in its favor by using the capabilities envisioned in this document, but the fundamental sources of friction cannot be eliminated. We will win—but we should not expect war in the future to be either easy or bloodless.

The requirement for global operations, the ability to counter adversaries who possess weapons of mass destruction, and the need to shape ambiguous situations at the low end of the range of operations will present special challenges en route to achieving full spectrum dominance. Therefore, the process of creating the joint force of the future must be flexible—to react to changes in the strategic environment and the adaptations of potential enemies, to take advantage of new technologies, and to account for variations in the pace of change. The source of that flexibility is the synergy of the core competencies of the individual services, integrated into the joint team. These challenges will require a total force composed of well-educated, motivated, and competent people who can adapt to the many demands of future joint missions. The transformation of the joint force to reach full spectrum dominance rests upon information superiority as a key enabler and our capacity for innovation.

Figure 2. Range of Military Operations



Military Operation	War	Military Operations Other Than War	
General U.S. Goals	Fight and Win	Deter War and Resolve Conflict	Promote Peace and Support U.S. Authorities
Examples	Large Scale Combat Operations Attack/Defend/Blockade	Peace Enforcement Counterterrorism Show of Force/Raid/Strike Peacekeeping/NEO Nuclear Assistance Counterinsurgency	Freedom of Navigation Counterdrug Humanitarian Assistance Protection of Shipping U.S. Civil Support

Information Superiority

Information, information processing, and communications networks are at the core of every military activity. Throughout history, military leaders have regarded information superiority as a key enabler of victory. However, the ongoing information revolution is creating not only a quantitative, but a qualitative change in the information environment that by 2020 will result in profound changes in the conduct of military operations. In fact, advances in information capabilities are proceeding so rapidly that there is a risk of outstripping our ability to capture ideas, formulate operational concepts, and develop the capacity to assess results. While the goal of achieving information superiority will not

change, the nature, scope, and rules of the quest are changing radically.

The qualitative change in the information environment extends the conceptual underpinnings of information superiority beyond the mere accumulation of more, or even better, information. The word *superiority* implies a state or condition of imbalance in one's favor. Information superiority is transitory in nature and must be created and sustained by the joint force through the conduct of information operations. However, the creation of information superiority is not an end in itself.

Information superiority provides the joint force a competitive advantage only when it is effectively translated into superior knowledge and decisions. The joint force must be able to take advantage of superior information converted to superior knowledge to achieve "decision superiority"—better decisions arrived at and implemented faster than an opponent can react or, in a noncombat situation, at a tempo that allows the force to shape the situation or react to changes and accomplish its mission. Decision superiority does not automatically result from information superiority. Organizational and doctrinal adaptation, relevant training and experience, and the proper command and control mechanisms and tools are equally necessary.

Information superiority—the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same (Joint Pub 1-02); achieved in a noncombat situation or one in which there are no clearly defined adversaries when friendly forces have the information necessary to achieve operational objectives.

Information environment—the aggregate of individuals, organizations, and systems that collect, process, or disseminate information, including the information itself (Joint Pub 1-02).

The evolution of information technology will increasingly permit us to integrate the traditional forms of information operations with sophisticated all-source intelligence, surveillance, and reconnaissance in a fully synchronized information campaign. The development of a concept labeled *the global information grid* will provide the network-centric environment required to achieve this goal. The grid will be the globally interconnected, end-to-end set of information capabilities, associated processes, and people to manage and provide information on demand to warfighters, policymakers, and support personnel. It will enhance combat power and contribute to the success of noncombat military operations as well. Realization of the full potential of these changes requires not only technological improvements, but the continued evolution of organizations and doctrine and the development of relevant training to sustain a comparative advantage in the information environment.

We must also remember that information superiority neither equates to perfect information, nor does it mean the elimination of the fog of war. Information systems, processes, and operations add their own sources of friction and fog to the operational environment. Information superiority is fundamental to the transformation of the operational capabilities of the joint force. The joint force of 2020 will use superior information and knowledge to achieve decision superiority, to support advanced command and control capabilities, and to reach the full potential of dominant maneuver, precision engagement, full dimensional protection, and focused logistics. The breadth and pace of this evolution demands flexibility and a readiness to innovate.

Innovation

Joint Vision 2010 identified technological innovation as a vital component of the transformation of the joint force. Throughout the industrial age, the United States has relied upon its capacity for technological innovation to succeed in military operations, and the need to do so will continue. It is important, however, to broaden our focus beyond technology and capture the importance of organizational and conceptual innovation as well.

Innovation, in its simplest form, is the combination of new things with new ways to carry out tasks. In reality, it may result from fielding completely new things, or the imaginative recombination of old things in new ways, or something in between. The ideas in *Joint Vision 2010* as carried forward in *Joint Vision 2020* are indeed innovative and form a vision for integrating doctrine, tactics, training, supporting activities, and technology into new operational capabilities. The innovations that determine joint and service capabilities will result from a general understanding of what future conflict and military operations will be like, and a view of what the combatant commands and services must do in order to accomplish assigned missions.

An effective innovation process requires continuous learning—a means of interaction and exchange that evaluates goals, operational lessons, exercises, experiments, and simulations—and that must include feedback mechanisms. The combatant commands and services must allow our highly trained and skilled professionals the opportunity to create new concepts and ideas that may lead to future breakthroughs. We must foster the innovations necessary to create the joint force of the future—not only with decisions

55th Signal Company (Milton H. Robinson)

1st Combat Camera Squadron (Jim Varhegyi)

regarding future versus present force structure and budgets, but also with a reasonable tolerance for errors and failures in the experimentation process. We must be concerned with efficient use of time and resources and create a process that gives us confidence that our results will produce battlefield success. However, an experimentation process with a low tolerance for error makes it unlikely that the force will identify and nurture the most relevant and productive aspects of new concepts, capabilities, and technology. All individuals and organizations charged with experimentation in support of the evolution of our combat forces must ensure that our natural concern for husbanding resources and ultimately delivering successful results does not prevent us from pursuing innovations with dramatic if uncertain potential.

There is, of course, a high degree of uncertainty inherent in the pursuit of innovation. The key to coping with that uncertainty is bold leadership supported by as much information as possible. Leaders must assess the efficacy of new ideas, the potential drawbacks to new concepts, the capabilities of potential adversaries, the costs versus benefits of new technologies, and the organizational implications of new capabilities. They must make these assessments in the context of an evolving analysis of the economic, political, and technological factors of the anticipated security environment. Each of these assessments will have uncertainty associated with them. But the best innovations have often come from people who made decisions and achieved success despite uncertainties and limited information.

By creating innovation, the combatant commands and services also create their best opportunities for coping with the increasing pace of change in the overall environment in which they function. Although changing technology is a primary driver of environmental change, it is not the only one. The search for innovation must encompass the entire context of joint operations—which means the Armed Forces must explore changes in doctrine, organization, training, matériel, leadership and education, personnel, and facilities as well as technology. Ultimately, the goal is to develop reasonable approaches with enough flexibility to recover from errors and unforeseen circumstances.

CONDUCT OF JOINT OPERATIONS

The complexities of the future security environment demand that the United States be prepared to face a wide range of threats of varying levels of intensity. Success in countering these threats will require the skillful integration of the core competencies of the services into a joint force tailored to the specific situation and objectives. Commanders must be afforded the opportunity to achieve the level of effectiveness and synergy necessary to conduct decisive operations across the entire range of military operations. When combat operations are required, they must have an overwhelming array of capabilities available to conduct offensive and defensive operations and against which an enemy must defend.

U.S. Navy (Chris Desmond)

Other complex contingencies such as humanitarian relief or peace operations will require a rapid, flexible response to achieve national objectives in the required timeframe. Some situations may require the capabilities of only one service, but in most cases, a joint force comprised of both active and Reserve components will be employed.

The complexity of future operations also requires that, in addition to operating jointly, our forces have the capability to participate effectively as one element of a unified national effort. This integrated approach brings to bear all the tools of statecraft to achieve our national objectives unilaterally when necessary, while making optimum use of the skills and resources provided by multinational military forces, regional and international organizations, nongovernmental organizations, and private voluntary organizations when possible. Participation by the joint force in operations supporting civil authorities will also likely increase in importance due to emerging threats to the U.S. homeland such as terrorism and weapons of mass destruction.

People

The core of the joint force of 2020 will continue to be an all volunteer force composed of individuals of exceptional dedication and ability. Their quality will matter as never before as our servicemembers confront a diversity of missions and technological demands that call for adaptability, innovation, precise judgment, forward thinking, and multicultural understanding. The Nation will continue to depend on talented individuals of outstanding character, committed to an ethic of selfless service.

Our people will require a multitude of skills. The services will play a critical role in perfecting their individual specialties and the core competencies of each organization. In addition, every member of the total force must be prepared to apply that expertise to a wide range of missions as a member of the joint team. Our servicemembers must have the mental agility to transition from preparing for war to enforcing peace to actual combat, when necessary. The joint force commander is thereby provided a powerful, synergistic force capable of dominating across the entire range of operations.

The missions of 2020 will demand servicemembers who can create and then take advantage of intellectual and technological innovations. Individuals will be challenged by significant responsibilities at tactical levels in the organization and must be capable of making decisions with both operational and strategic implications. Our vision of full spectrum dominance and the transformation of operational capabilities has significant implications for the training and education of our

U.S. Navy (Leland B. Comer)

people. The tactics of information operations, the coordination of interagency and multinational operations, as well as the complexity of the modern tools of war all require people who are both talented and trained to exacting standards. Rapid and dispersed operations will require men and women who are part of a cohesive team, yet are capable of operating independently to meet the commander's intent. The evolution of new functional areas, such as space operations and information operations, will require development of appropriate career progression and leadership opportunities for specialists in those fields. The accumulation of training and experience will create a force ready to deploy rapidly to any point on the globe and operate effectively.

The joint force of 2020 will face a number of challenges in recruiting and retaining the outstanding people needed to meet these requirements. First, expanding civilian education and employment opportunities will reduce the number of candidates available for military service. We will continue to focus on our members' standard of living and a competitive compensation strategy to ensure we attract the quality individuals we need. Second, the increasing percentage of members with dependents will require a commitment to family-oriented community support programs and as much stability as possible, as well as close monitoring of the impact of the operations tempo. Finally, our increased dependence on the Reserve component will require us to address the concerns of our Reserve members and their employers regarding the impact on civilian careers. The Department of Defense must meet these challenges head-on.

Military operations will continue to demand extraordinary dedication and sacrifice under the most adverse conditions. Our total force, composed of professionals armed with courage, stamina, and intellect, will succeed despite the complexity and pace of future operations.

Interoperability

Interoperability is the foundation of effective joint, multinational, and interagency operations. The joint force has made significant progress toward achieving an optimum level of interoperability, but there must be a concerted effort toward continued improvement. Further improvements will include the refinement of joint doctrine as well as further development of common technologies and processes. Exercises, personnel exchanges, agreement on standardized operating procedures, individual training and education, and planning will further enhance and institutionalize these capabilities. Interoperability is a mandate for the joint force of 2020—especially in terms of communications, common logistics items, and information sharing. Information systems and equipment that enable a common relevant operational picture must work from shared networks that can be accessed by any appropriately cleared participant.

Interoperability—the ability of systems, units, or forces to provide services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together (Joint Pub 1-02).

Although technical interoperability is essential, it is not sufficient to ensure effective operations. There must be a suitable focus on procedural and organizational elements, and decisionmakers at all levels must understand each other's capabilities and constraints. Training and education, experience and exercises, cooperative planning, and skilled liaison at all levels of the joint force will not only overcome the barriers of organizational culture and differing priorities, but will teach members of the joint team to appreciate the full range of service capabilities available to them.

The future joint force will have the embedded technologies and adaptive organizational structures that will allow trained and experienced people to develop compatible processes and procedures, engage in collaborative planning, and adapt as necessary to specific crisis situations. These features are not only vital to the joint force, but to multinational and interagency operations as well.

U.S. Navy (David Tucker)

Multinational Operations

Since our potential multinational partners will have varying levels of technology, a tailored approach to interoperability that accommodates a wide range of needs and capabilities is necessary. Our more technically advanced allies will have systems and equipment that are essentially compatible, enabling them to interface and share information in order to operate effectively with U.S. forces at all levels. However, we must also be capable of operating with allies and coalition partners who may be technologically incompatible—especially at the tactical level. Additionally, many of our future partners will have significant specialized capabilities that may be integrated into a common operating scheme. At the same time, the existence of these relationships does not imply access to information without constraints. We and our multinational partners will continue to use suitable judgment regarding the protection of sensitive information and information sources.

Multinational operations—a collective term used to describe military actions conducted by forces of two or more nations usually undertaken within the structure of a coalition or alliance (Joint Pub 1-02).

In all cases, effective command and control is the primary means of successfully extending the joint vision to multinational operations. Technological developments that connect the information systems of partners will provide the links that lead to a common relevant operational picture and improve command and control. However, the sharing of information needed to maintain the tempo of integrated multinational operations also relies heavily on a shared understanding of operational procedures and compatible organizations. The commander must have the ability to evaluate information in its multinational context. That context can only be appreciated if sufficient regional expertise and liaison capability are available on the commander's staff. A deep understanding of the cultural, political, military, and economic characteristics of a region must be established and maintained. Developing this understanding is dependent upon shared training and education, especially with key partners, and may require organizational change as well. The overall effectiveness of multinational operations is therefore dependent on interoperability between organizations, processes, and technologies.

Interagency Operations

The primary challenge of interagency operations is to achieve unity of effort despite the diverse cultures, competing interests, and differing priorities of the participating organizations, many of whom guard their relative independence, freedom of action, and impartiality. Additionally, these organizations may lack the structure and resources to support extensive liaison cells or integrative technology. In this environment and in the absence of formal command relationships, the future joint force must be proactive in improving communications, planning, interoperability, and liaison with potential interagency participants. These factors are important in all aspects of interagency operations, but particularly in the context of direct threats to citizens and facilities in the U.S. homeland. Cohesive interagency action is vital to deterring, defending against, and responding to such attacks. The joint force must be prepared to support civilian authorities in a fully integrated effort to meet the needs of U.S. citizens and accomplish the objectives specified by the National Command Authorities.

All organizations have unique information assets that can contribute to the common relevant operational picture and support unified action. They also have unique information requirements. Sharing information with appropriately cleared participants and integration of information from all sources are essential. Understanding each other's requirements and assets is also crucial. More importantly, through training with potential interagency partners, experienced liaisons must be

Interagency coordination—the coordination that occurs between elements of the Department of Defense and engaged U.S. Government agencies, nongovernmental organizations, private voluntary organizations, and regional and international organizations for the purpose of accomplishing an objective (Joint Pub 1-02).

1st Combat Camera Squadron (Jerry Morrison)

Dominant maneuver—the ability of joint forces to gain positional advantage with decisive speed and overwhelming operational tempo in the achievement of assigned military tasks. Widely dispersed joint land, sea, air, space, and special operations forces, capable of scaling and massing force or forces and the effects of fires as required for either combat or noncombat operations, will secure advantage across the range of military operations through the application of information, deception, engagement, mobility, and countermobility capabilities.

developed to support long-term relationships, collaborative planning in advance of crises, and compatible processes and procedures. As with our multinational partners, interoperability in all areas of interaction is essential to effective interagency operations.

Operational Concepts

The joint force capable of dominant maneuver will possess unmatched speed and agility in positioning and repositioning tailored forces from widely dispersed locations to achieve operational objectives quickly and decisively. The employment of dominant maneuver may lead to achieving objectives directly, but can also facilitate employment of the other operational concepts. For example, dominant maneuver may be employed to dislodge enemy forces so they can be destroyed through precision engagement. At times, achieving positional advantage will be a function of operational maneuver over strategic distances. Overseas or U.S.-based units will mass forces or effects directly to the operational theater. Information superiority will support the conduct of dominant maneuver by enabling adaptive and concurrent planning; coordination of widely dispersed units; gathering of timely feedback on the status, location, and activities of subordinate units; and anticipation of the course of events leading to mission accomplishment. The joint force will also be capable of planning and conducting dominant maneuver in cooperation with interagency and multinational partners with varying levels of commitment and capability.

The capability to rapidly mass force or forces and the effects of dispersed forces allows the joint

U.S. Navy (Franklin P. Call)

force commander to establish control of the battlespace at the proper time and place. In a conflict, this ability to attain positional advantage allows the commander to employ decisive combat power that will compel an adversary to react from a position of disadvantage, or quit. In other situations, it allows the force to occupy key positions to shape the course of events and minimize hostilities or react decisively if hostilities erupt. And in peacetime, it constitutes a credible capability that influences potential adversaries while reassuring friends and allies.

Beyond the actual physical presence of the force, dominant maneuver creates an impact in the minds of opponents and others in the operational area. That impact is a tool available to the joint force commander across the full range of military operations. In a conflict, for example, the presence or anticipated presence of a decisive force might well cause an enemy to surrender after minimal resistance. During a peacekeeping mission, it may provide motivation for good-faith negotiations or prevent the instigation of civil disturbances. In order to achieve such an impact, the commander will use information operations as a force multiplier by making the available combat power apparent without the need to physically move elements of the force. The joint force commander will be able to take advantage of the potential and actual effects of dominant maneuver to gain the greatest benefit.

Precision Engagement

Simply put, precision engagement is effects-based engagement that is relevant to all types of operations. Its success depends on in-depth analysis to identify and locate critical nodes and targets. The pivotal characteristic of precision engagement is the linking of sensors, delivery systems, and effects. In the joint force of the future, this linkage will take place across services and will incorporate the applicable capabilities of multinational and interagency partners when appropriate. The resulting system of systems will provide the commander the broadest possible range of capabilities in responding to any situation, including both kinetic and nonkinetic weapons capable of creating the desired lethal or nonlethal effects.

Precision engagement—the ability of joint forces to locate, surveil, discern, and track objectives or targets; select, organize, and use the correct systems; generate desired effects; assess results; and reengage with decisive speed and overwhelming operational tempo as required, throughout the full range of military operations.

The concept of precision engagement extends beyond precisely striking a target with explosive ordnance. Information superiority will enhance the capability of the joint force commander to understand the situation, determine the effects desired, select a course of action and the forces to execute it, accurately assess the effects of that action, and reengage as necessary while minimizing collateral damage. During conflict, the commander will use precision engagement to obtain lethal and nonlethal effects in support of the objectives of the campaign. This action could include destroying a target using

55th Signal Company (Clinton J. Evans)

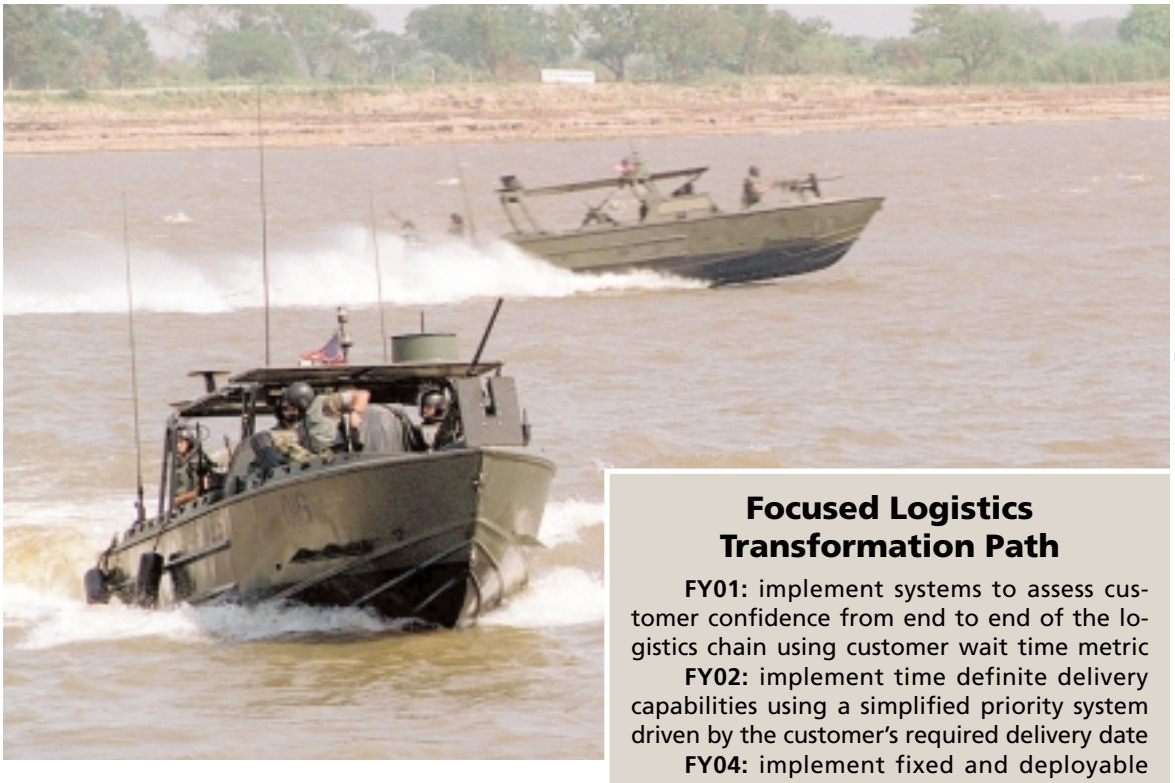
conventional forces, inserting a special operations team, or even the execution of a comprehensive psychological operations mission. In other cases, precision engagement may be used to facilitate dominant maneuver and decisive close combat. The commander may also employ nonkinetic weapons, particularly in the arena of information operations where the targets might be key enemy leaders or troop formations, or the opinion of an adversary population.

In noncombat situations, precision engagement activities will naturally focus on nonlethal actions. These actions will be capable of defusing volatile situations, overcoming misinformation campaigns, or directing a flow of refugees to relief stations, for example. Regardless of its application in combat or noncombat operations, the capability to engage precisely allows the commander to shape the situation or battlespace in order to achieve the desired effects while minimizing risk to friendly forces and contributing to the most effective use of resources.

Focused Logistics

Focused logistics will provide military capability by ensuring delivery of the right equipment, supplies, and personnel in the right quantities, to the right place, at the right time to support operational objectives. It will result from revolutionary improvements in information systems, innovation in organizational structures, reengineered processes, and advances in transportation technologies. This transformation has already begun with changes scheduled for the near term facilitating the ultimate realization of the full potential of focused logistics.

Focused logistics will effectively link all logistics functions and units through advanced information systems that integrate real-time total asset visibility with a common relevant operational picture. These systems will incorporate enhanced decision support tools that will improve analysis, planning, and anticipation of warfighter requirements. They will also provide a more seamless connection to the commercial sector to take advantage of applicable advanced business practices



2d Marine Division (Tyler J. Mielke)

Focused Logistics Transformation Path

FY01: implement systems to assess customer confidence from end to end of the logistics chain using customer wait time metric

FY02: implement time definite delivery capabilities using a simplified priority system driven by the customer's required delivery date

FY04: implement fixed and deployable automated identification technologies and information systems that provide accurate, actionable total asset visibility

FY04: for early deploying forces and **FY06** for the remaining forces, implement a Web-based, shared data environment to ensure the joint warfighters' ability to make timely and confident logistics decisions.

and commercial economies. Combining these capabilities with innovative organizational structures and processes will result in dramatically improved end-to-end management of the entire logistics system and provide precise real-time control of the logistics pipeline to support the joint force commander's priorities. The increased speed, capacity, and efficiency of advanced transportation systems will further improve deployment, distribution, and sustainment. Mutual support relationships and collaborative planning will enable optimum cooperation with multinational and interagency partners.

Focused logistics—the ability to provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations. This will be made possible through a real-time, web-based information system providing total asset visibility as part of a common relevant operational picture, effectively linking the operator and logistician across services and support agencies. Through transformational innovations to organizations and processes, focused logistics will provide the joint warfighter with support for all functions.

The result for the joint force of the future will be an improved link between operations and logistics resulting in precise time-definite delivery of assets to the warfighter. This substantially improved operational effectiveness and efficiency, combined with increasing warfighter confidence in these new capabilities, will concurrently reduce sustainment requirements and the vulnerability of logistics lines of communication, while appropriately sizing and potentially reducing the logistics footprint. The capability for focused logistics will effectively support the joint force in combat and provide the primary operational element in the delivery of humanitarian or disaster relief, or other activities across the range of military operations.

Full Dimensional Protection

Our military forces must be capable of conducting decisive operations despite our adversaries' use of a wide range of weapons (including weapons of mass destruction), the conduct of information operations or terrorist attacks, or the presence of asymmetric threats during any phase of these operations. Our people and the other

U.S. Air Force (Mitch Fuqua)

military and nonmilitary assets needed for the successful conduct of operations must be protected wherever they are located—from deployment, to theater combat, to redeployment. Full dimensional protection exists when the joint force can decisively achieve its mission with an acceptable degree of risk in both the physical and information domains.

Full dimensional protection—the ability of the joint force to protect its personnel and other assets required to decisively execute assigned tasks. Full dimensional protection is achieved through the tailored selection and application of multilayered active and passive measures within the domains of land, sea, air, space, and information across the range of military operations with an acceptable level of risk.

The capability for full dimensional protection incorporates a complete array of both combat and noncombat actions in offensive and defensive operations, enabled by information superiority. It will be based upon active and passive defensive measures, including theater missile defenses and possibly limited missile defense of the United States, offensive countermeasures, security procedures, antiterrorism measures, enhanced intelligence collection and assessments, emergency preparedness, heightened security awareness, and proactive engagement strategies. Additionally, it will extend beyond the immediate theater of operations to protect our reach-back, logistics, and key capabilities in other locations. There is a critical need for protection of the information content and systems vital for operational success, including increased vigilance in counterintelligence and information security. The joint force of 2020 will integrate protective capabilities from multinational and interagency partners when available and will respond to their requirements when possible. Commanders will thoroughly assess and manage risk as they apply protective measures to specific operations, ensuring that an appropriate level of safety, compatible with other mission objectives, is provided for all assets.

The joint force commander will thereby be provided an integrated architecture for protection, which will effectively manage risk to the joint force and other assets, and leverage the contributions of all echelons of our forces and those of our multinational and interagency partners. The result will be improved freedom of action for friendly forces and better protection at all echelons.

Information Operations

Information operations are essential to achieving full spectrum dominance. The joint force must be capable of conducting information operations, the purpose of which is to facilitate

1st Combat Camera Squadron (Jim Varhegyi)

and protect U.S. decisionmaking processes and, in a conflict, degrade those of an adversary. While activities and capabilities employed to conduct information operations are traditional functions of military forces, the pace of change in the information environment dictates that we expand this view and explore broader information operations, strategies, and concepts. We must recognize that nontraditional adversaries who engage in nontraditional conflict are of particular importance in the information domain. The United States itself and U.S. forces around the world are subject to information attacks on a continuous basis regardless of the level and degree of engagement in other domains of operation. The perpetrators of such attacks are not limited to the traditional concept of a uniformed military adversary. Additionally, the actions associated with information operations are wide-ranging—from physical destruction to psychological operations to computer network defense. The task of integrating information operations with other joint force operations is complicated by the need to understand the many variables involved (summarized in box).

Information operations—those actions taken to affect an adversary's information systems while defending one's own information systems (Joint Pub 1-02). Information operations also include actions taken in a noncombat or ambiguous situation to protect one's own information and information systems as well as those taken to influence target information and information systems.

Our understanding of the interrelationships of these variables and their impact on military operations will determine the nature of information operations in 2020. The joint force commander will conduct information operations whether facing an adversary during a conflict or engaged in humanitarian relief operations. Such operations will be synchronized with those of multinational and interagency partners as the situation dictates. New offensive capabilities such as computer network attack techniques are evolving. Activities such as information assurance, computer network defense, and counterdeception will defend decisionmaking processes by neutralizing an adversary's perception management and intelligence collection efforts, as well as direct attacks on our information systems. Because the ultimate target of information operations is the human decisionmaker, the joint force commander will have difficulty accurately assessing the effects of those operations. This problem of battle damage assessment for information operations is difficult and must be explored through exercises and rigorous experimentation.

The continuing evolution of information operations and the global information environment holds two significant implications. First, operations within the information domain will become as important as those conducted in the domains of land, sea, air, and space. Such operations will be inextricably linked to focused logistics, full dimensional protection, precision engagement, and dominant maneuver, as well as joint command and control. At the same time, information operations may evolve into a separate mission area requiring the services to maintain appropriately designed organizations and trained specialists. Improvements in doctrine, organization, and technology may lead to decisive outcomes resulting primarily from information operations. As information operations continue to evolve, they, like other military operations, will be conducted consistent with the norms of our society, our alliances with other democratic states, and full respect for the laws of armed conflict. Second, there

The Variables of Information Operations

- multidimensional definition and meaning of *information*—target, weapon, resource, or domain of operations
- level of action and desired effect—tactical, operational, strategic, or combination
- objective of operations—providing information, perception management, battlefield dominance, command and control warfare, systemic disruption, or systemic destruction
- nature of situation—peace, crisis, or conflict.

U.S. Navy (T. Vahn Nequin)

is significant potential for asymmetric engagements in the information domain. The United States has enjoyed a distinct technological advantage in the information environment and will likely continue to do so. However, as potential adversaries reap the benefits of the information revolution, the comparative advantage for the United States and its partners will become more difficult to maintain. Additionally, our ever-increasing dependence on information processes, systems, and technologies adds potential vulnerabilities that must be defended.

Command and Control

Command and control is the exercise of authority and direction over the joint force. It is necessary for the integration of service core competencies into effective joint operations. The increasing importance of multinational and interagency aspects of the operations adds complexity and heightens the challenge of doing so. Command and control includes planning, directing, coordinating, and controlling forces and operations and is focused on the effective execution of the operational plan; but the central function is decisionmaking.

Command and control is most effective when decision superiority exists. Decision superiority results from superior information filtered through the commander's experience, knowledge, training, and judgment; the expertise of supporting staffs and other organizations; and the efficiency of associated processes. While changes in the information environment have led some to focus solely on the contribution of information superiority to command and control, it is equally necessary to understand the complete realm of command and control decisionmaking, the nature of organizational collaboration, and especially the human in the loop.

In the joint force of the future, command and control will remain the primary integrating and coordinating function for operational capabilities and service components. As the nature of military operations evolves, there is a continual need to evaluate the nature of command and control organizations, mechanisms, systems, and tools. There are two major issues to address in this evaluation—command structures and processes, and the information systems and technologies that are best suited to support them. Encompassed within these two issues, examination of the following related ideas and desired capabilities will

U.S. Navy (Shane McCoy)

serve as a catalyst for changes in doctrine, organization, and training.

- Commanders will need a broad understanding of new operational capabilities and new (often highly automated) supporting tools in order to be capable of flexible, adaptive coordination and direction of both forces and sensors.
- The staffs that support commanders must be organized and trained to take advantage of new capabilities. Commanders and staffs must also be capable of command and control in the face of technology failure.
- Commanders will be able to formulate and disseminate intent based upon up-to-date knowledge of the situation existing in the battlespace.
- Joint force headquarters will be dispersed and survivable and capable of coordinating dispersed units and operations. Subordinate headquarters will be small, agile, mobile, dispersed, and networked.
- Faster operations tempos, increased choices among weapons and effects, and greater weapons ranges will require continuous, simultaneous planning and execution at all levels.
- Expanding roles for multinational and interagency partners will require collaborative planning capabilities, technological compatibility/interoperability, and mechanisms for efficient information sharing.

Finally, as these and other changes take place over time, we must carefully examine three aspects of the human element of command and control. First, leaders of the joint force must analyze and understand the meaning of unit cohesion in the context of the small, widely dispersed units that are now envisioned. Second, decisionmakers at all levels must understand the implications of new technologies that operate continuously in all conditions when human beings are incapable of the same endurance. Third, as new information technologies, systems, and procedures make the same detailed information available at all levels of the chain of command, leaders must understand the implications for decisionmaking processes, the training of decisionmakers at all levels, and organizational patterns and procedures. The potential for overcentralization of

Command and control—the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission (Joint Pub 1-01).

control and the capacity for relatively junior leaders to make decisions with strategic impact are of particular importance.

It has often been said that command is an art and control is a science—a basic truth that will remain. Our thinking about command and control must be conceptually based rather than focused on technology or matériel. Joint command and control is a nexus—a point of connection. It serves as a focal point for humans and technology, our evolving operational capabilities, and the capabilities of the services. The development of effective joint command and control for the future requires rigorous and wide-ranging experimentation, focused especially on organizational innovation and doctrinal change.

IMPLEMENTATION

Joint Vision 2010 has had a profound impact on the development of U.S. military capabilities. By describing those capabilities necessary to achieve success in 2010, we set in motion three important efforts. First, *Joint Vision 2010* established a common framework and language for the services to develop and explain their unique contributions to the joint force. Second, we created a process for the conduct of joint experimentation and training to test ideas against practice. Finally, we began a process to manage the transformation of doctrine, organization, training, matériel, leadership and education, personnel, and facilities necessary to make the vision a reality. *Joint Vision 2020* builds on this foundation of success and will sustain the momentum of these processes.

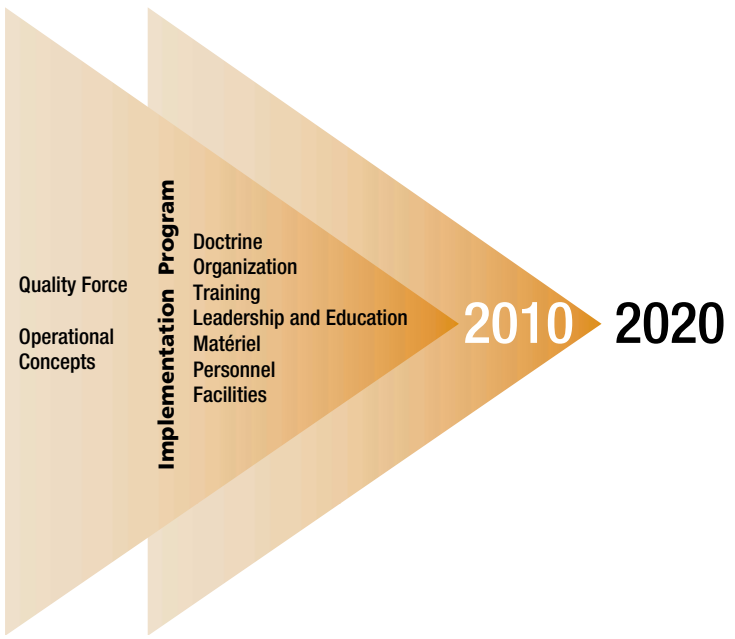
From Vision to Experimentation

- *Joint Vision 2010* (1996)
- Concept for Future Joint Operations (1997)
- 21st Century Challenges and Desired Operational Capabilities (1997)
- Joint Warfighting Experimentation Program established, ACOM (JFCOM) as executive agent (1998)
- Joint Vision Implementation Master Plan (1998)
- CJCS Instruction 3170, Requirements Generation System (1999)
- JFCOM Joint Experimentation Campaign Plans (1999 and 2000).

The foundation of jointness is the strength of individual service competencies pulled together. Our objective in implementing the joint vision is the optimal integration of all joint forces and effects. To achieve that goal, the interdependence of the services requires mutual trust and reliance among all warfighters and a significantly improved level of interoperability—especially in the areas of command and control and sustainment. This interdependence will ultimately result in a whole greater than the sum of its parts and will contribute to achieving full spectrum dominance through all forces acting in concert. The synergy gained through the interdependence of the services makes clear that jointness is more than interoperability. The joint force requires capabilities that are beyond the simple combination of service capabilities, and joint experimentation is the process by which those capabilities will be achieved.

To ensure unity of effort and continuity for joint concept development and experimentation, the Secretary of Defense designated the commander in chief, Joint Forces Command as the executive agent for experimentation design, preparation, execution, and assessment. Annual campaign plans provide focus to this effort and continuity in experimentation. The results of this iterative experimentation cycle are forwarded as comprehensive recommendations for changes in doctrine, organization, training, matériel, leadership and education, personnel, and facilities and lead to the co-evolution of all those elements. The experimentation and implementation

Figure 3. From Concepts to Capabilities



U.S. Marine Corps (Brook R. Kelsey)

process supporting the transformation of the joint force is also dependent upon combatant command and service exercises and experimentation activities. The combatant command and service visions support the joint vision by providing guidance for these individual efforts that are congruent with the Chairman's vision. Thus, in their own experimentation venues, the services may develop recommendations with joint implications and will forward them to the appropriate joint experimentation activity.

To effect transforming and enduring changes to our joint military capabilities, the experimentation and implementation process must include construction of a wide range of scenarios and imaginative conflict simulations to explore the shape of future operations. Such intensive exploration of alternative concepts of operations can help the U.S. military choose innovations that take the greatest advantage of combinations of new ideas and new technologies. The rapid pace of such changes will then drive further development of the experimentation and implementation process to field improved capabilities for the joint force.

The linchpin of progress from vision to experimentation to reality is joint training and education—because they are the keys to intellectual change. Without intellectual change, there is no real change in doctrine, organizations, or leaders. Thus, the implementation process is dependent upon incorporating concepts validated by experimentation into joint professional military education programs and joint exercises. In this way, individual servicemembers and units become a joint team capable of success across the full range of military operations.

This vision is firmly grounded in the view that the U.S. military must be a joint force capable of full spectrum dominance. Its basis is fourfold: the global interests of the United States and the continuing existence of a wide range of potential threats to those interests; the centrality of information technology to the evolution of not only our own military, but also the capabilities of other actors around the globe; the premium a continuing broad range of military operations will place on the successful integration of multinational and interagency partners and the interoperability of processes, organizations, and systems; and our reliance on the joint force as the foundation of future U.S. military operations.

Joint Vision 2020 builds on the foundation and maintains the momentum established with *Joint Vision 2010*. It confirms the direction of the ongoing transformation of operational capabilities, and emphasizes the importance of further experimentation, exercises, analysis, and conceptual thought, especially in the arenas of information operations, joint command and control, and multinational and interagency operations.

This vision recognizes the importance of technology and technical innovation to the U.S. military and its operations. At the same time, it emphasizes that technological innovation must be accompanied by intellectual innovation leading to changes in organization and doctrine. Only then can we reach the full potential of the joint force—decisive capabilities across the full range of military operations. Such a vision depends upon the skill, experience, and training of the people comprising the total force and their leaders. The major innovations necessary to operate in the environment depicted herein can only be achieved through the recruitment, development, and retention of men and women with the courage, determination, and strength to ensure we are persuasive in peace, decisive in war, and preeminent in any form of conflict. **JFQ**

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