TRADOC Pamphlet 525-3-3

The United States Army Functional Concept for

Battle Command

2015-2024

Version 1.0

30 April 2007

Foreword

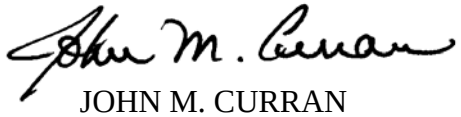
From the Director
U.S. Army Capabilities Integration Center

This concept provides amplification to the Army's capstone and operating concepts in the battle command functional area. It focuses on the commander and his or her role in exercising the art and science of *Battle Command* for the future Modular Force during the 2015-2024 timeframe. The concept describes the role the commander plays in achieving decision superiority over adversaries. It also identifies required capabilities for the further examination of potential doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) solutions.

As this concept demonstrates, the Army has a well-developed body of ideas regarding how we can better support joint force commanders (JFC) to conduct successful campaigns in the future. However, it is equally clear that the Army cannot achieve its conceptual goals for improvement without an array of capabilities that must be developed by other Services and the larger joint community, particularly in the areas of battlespace awareness and joint command and control. I strongly encourage the use of the *Battle Command* concept in our interactions with other Services and joint organizations in the spirit of joint interdependence.

This concept is the outcome of a collaborative effort involving subject matter experts from throughout the Army, and the product of a detailed study of strategic guidance, current doctrine, and lessons learned. It assumes a future that includes complex situational environments; thinking, adaptive, and highly-capable enemies; and Army operations that must be fully integrated into a joint, interagency, and multi-national framework. From these efforts, the concept offers new ideas for further examination so that the future Modular Force will be able to defeat any adversary or control any situation across the full range of military operations.

As with all concepts, the *Battle Command* concept is in continuous evolution. It will be refined and updated as new learning emerges from research, operational experience, joint and Army wargaming, experimentation, and combat development.



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Executive Summary

Introduction

a. The commander has been the central figure throughout military history. Empowered with extensive authority, the commander is responsible and accountable for all that forces under their command do or fail to do. Among their many duties, commanders are charged to develop, maintain, and use the full range of human potential in their organizations to accomplish assigned missions.

b. The function of battle command in the future Modular Force will not be significantly different from today. Battle command will continue to be a combination of art and science in which commanders use their experience, knowledge, and insights to plan and execute operations to accomplish the mission.[1] On the other hand, properly understood, the tools available to assist him and his staff will offer new and expanded capabilities to perform their essential functions of visualizing, describing, and directing the forces under their command.

Operational Problem

a. Increasingly complex full spectrum operations, executed across the full range of military operations (ROMO), distributed throughout the joint operations area (JOA), will place high demands on future Modular Force commanders. Operations with joint and multi-national forces along with a mix of current and future organizations, and systems with varying degrees of interoperability, will exacerbate this challenge. The growing need for integrating and working closely with interagency, non-governmental, and other civilian agencies in all operations will further stretch future Modular Force leaders' ability to exercise command and control. All levels of command will face this same expanded challenge as the boundaries between strategic, operational, and tactical levels of war continue to blur.

b. Adaptive, thinking adversaries will confound simplistic approaches by fighting asymmetrically in order to avoid defeat while attempting to prolong conflict and outlast our will to fight. Misunderstood or ineffectively structured, tools and systems, fed by information systems incorporating and fusing human and sensor input, intended to produce improved situational awareness (SA), may, in fact, adversely affect the commander's ability to make timely decisions. Current deliberate and crisis action planning methods and the means to translate them into timely orders may not meet this challenge which will approach the limits of both human and technological capabilities of the future.

Solution Synopsis

a. Future Modular Force commanders must exercise the art of battle command using the best available information in an uncertain environment to make tough decisions that put Soldiers' lives on the line.[2] The commander must be the focal point of decisionmaking and execution within military operations. The role of the staff, and supporting technological aids,

[1] *Battle command* is the art and science of understanding, visualizing, describing, directing, leading, and assessing forces in operations against a hostile, thinking, and adaptive enemy. Battle command applies leadership to translate decisions into actions, by synchronizing forces and warfighting functions in time, space, and purpose, to accomplish missions. FM 3-0 *Operations.*

[2] Wallace, William S., Lieutenant General, *Network-Enabled Battle Command*, RUSI Defence Systems, Spring 2005, p. 22.

is to support the commander in achieving situational understanding (SU), making decisions, disseminating directives, and following directives through execution. SU requires the commander to apply their skilled judgment, and that of their staff, to interpreting information in the context of the mission, the higher commanders' intent, and visualization of the end state of the mission, and to apply that interpretation to improve the likelihood of mission success. Inevitably, even with net-centricity, there is more data and less information than one would like.

b. Efficiently converting data to information and actionable knowledge is a function of command, enabling a commander to apply experience and, depending on the level of command and time available, the appropriate elements of operational design to identify feasible solutions. Leaders must learn how to take advantage of improved information availability, processing, and distribution to achieve the best possible SA and manage the challenges engendered by the increased complexity and expansiveness of command. This calls for adjustments and improvements in both technological capabilities and human processes. Gaining and maintaining a common operational picture (COP) at all levels will facilitate mission orders and foster commanders capable of acting in consonance with the higher commander's intent. Developing graphic display aids and cognitive skills that enable commanders to visualize the operation and then describe it in terms of intent and guidance is central to the *Battle Command* concept. Developing processes to direct actions within that intent become the means to insure control while allowing the commander and subordinates time to quickly react to expected and unexpected events.

Key Ideas

- Centrality of the commander
- Role of the commander: framing, planning, preparing, executing, assessing, and reframing operations
- Mission command
- Self-synchronizing forces
- Collaborative planning and accelerated and streamlined military decision making process (MDMP)
- Decision superiority: central, critical role of high SA, shared SA, SU and the COP
    - Continuous battle assessment, incremental adjustment to operations during execution
    - Adaptive command and control (C2) processes and structures, expanding span of control, and virtual staff
- Single, integrated Army battle command system(s), joint capable at lower levels
    - The network
    - Interagency and multi-national interoperability and integration
    - Horizontal and vertical fusion
      Ubiquitous, redundant, continuous communications network

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Military Operations

THE UNITED STATES ARMY FUNCTIONAL CONCEPT FOR BATTLE COMMAND 2015-2024

History. This publication is a new United States Army Training and Doctrine Command (TRADOC) Pamphlet as part of the Army Concept Strategy for the future Modular Force.

Summary. TRADOC Pamphlet (Pam) 525-3-3, *The United States Army Functional Concept for Battle Command 2015-2024*, is the overarching conceptual visualization of how the Army future Modular Force will execute the command function during joint operations in the period 2015-2024 to achieve full spectrum dominance across the range of military operations. The ideas presented here are fully integrated within the evolving context of estimates of the future operating environment, joint and Army strategic guidance, and the joint framework.

Applicability. This concept applies to all Department of the Army (DA) services, agencies, and activities involved in the future Modular Force. It functions as the conceptual basis for developing required solution sets related to the future Modular Force battle command within the domains of doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF).

Proponent and exception authority. The proponent of this pamphlet is the Director, Army Capabilities Integration Center, Concept Development and Experimentation Directorate, Fort Monroe, VA 23651-1046.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, TRADOC (ATFC-ED), Fort Monroe, VA 23651-1046. Suggested improvements may also be submitted using DA Form 1045 (Army Ideas for Excellence Program Proposal).

Distribution. This publication is only available on the TRADOC Homepage at http://www.tradoc.army.mil/tpubs/pamndx.htm.

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Chapter 1
Introduction

1-1. Purpose

a. *The U.S. Army Functional Concept for Battle Command 2015-2024*, provides a visualization of how future Modular Force commanders will exercise command and control (C2) of Army operations in a joint, interagency, and multi-national (JIM) environment. The concept is nested within TRADOC Pamphlet 525-3-0, *The Army in Joint Operations*, and within the *Joint Command and Control Functional Concept*.

b. This concept will generate thought and discussion about new methods for performing C2 across the ROMO. It will drive experimentation and wargaming to further refine these required capabilities and broad functional characteristics within the doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) domains and guide capability development.

1-2. Scope

a. The *Battle Command* concept envisions C2 in the network-enabled environment of 2015-2024. The Army future Modular Force will project full spectrum dominant landpower from major combat operations (MCO) to supporting domestic and diplomatic initiatives. Globalization will create a wide range of international security issues fueled by competition between cultures, religions, governments, and economics. Accordingly, this concept will address the capabilities required at the strategic, operational, and tactical levels of operations. It will describe how the commanders and staffs use the collaborative information environment (CIE) during the planning, preparing, execution, and assessment processes to enhance cognitive processes and advanced information analysis and presentation techniques to support more timely and effective decisionmaking.

b. This environment will support automated decision aids, information fusion and synchronization capabilities, and other techniques to facilitate better understanding of the tactical situation, more thorough evaluation of courses of action, and, ultimately, better and more timely decisions.

1-3. Conceptual Foundations

a. This concept fully supports the family of approved and emerging joint concepts, pursuant to the joint operations concepts development process, including the *Capstone Concept for Joint Operations* (CCJO), the *Command and Control Joint Integrating Concept*, the *Battlespace Awareness Functional Concept*, the *Network-Centric Environment Joint Functional Concept*, and the *Joint Force Command and Control Joint Functional Concept*. The ideas presented here are also fully nested within the Strategic Planning Guidance, Army Strategic Planning Guidance, and Joint and Army Transformation Roadmaps, as well as, TRADOC Pamphlet 525-3-0, *The Army in Joint Operations: The Army's Future Force Capstone Concept 2015 – 2024*, and the two future Modular Force operating concepts;

TRADOC Pamphlet 525-3-1, *The Army Operating Concept for Operating Maneuver 2015-2024*, and TRADOC Pamphlet 525-3-2, *The Army Concept for Tactical Maneuver 2015-2024*.

b. The *Battle Command* concept is one of six Army functional concepts, along with *See, Move, Strike, Protect,* and *Sustain*.[3] While battle command is an integral part of all of these, it closely integrates with the *See* concept, which enables Army units to acquire and process data, information, and knowledge to facilitate understanding and decisionmaking. These functional concepts have emerged as a result of years of research, wargaming, experimentation, and operational lessons learned by the Army, other Services, and the joint community. These concepts are far from final, yet are a start point for a dynamic, professional dialogue on how best to meet the needs of the Nation together with our partners in the defense community. Their purpose is to shape the Army's continuing campaign of learning. As the Army tests these ideas, even to the point of failure, we expect them to evolve. The *Battle Command* concept also integrates previously completed concept development and experimentation.

1-4. Limitations

a. There are numerous potential limiting factors on the ability of the future Modular Force to exercise effective command. In addition to the classic "fog of war," the following list, derived from the *See* concept, applies equally to the *Battle Command* concept.

b. The availability of an adequate, accessible, and reliable network for all of the future Modular Forces. Regardless of design and capabilities, the same battlefield friction and chaos that other capabilities are subject to will impact the future Modular Force network. This may occur as a result of the operating environment, error, system failures, or deliberate enemy action.

c. Information management tools and processes. It is probable that not all levels of network capability will be adequate for all uses and users, at all times. This will demand a high level of prioritization and synchronization of command efforts similar to those for MCO.

d. The vast amounts of data, information, and knowledge available through the network have the potential to either overwhelm users, or limit the full use of available knowledge.

e. The concept's full, unhindered application will be regulated, and often prevented, by information sharing protocols, law, security, and policy. This will impact data and information sharing, and ultimately some level of knowledge generation between agencies, organizations and nations.

[3] See reference list for complete titles.

f. The large number of fusion points on the battlefield, from individual Soldiers and Future Combat Systems' vehicles to the joint force (JF) intelligence component, will increase the potential for multiple, conflicting interpretations of the data and information.

g. The stress of the increasing tempo of combat on acquiring and processing data and information, from decisionmaking to execution, will multiply demands on humans and systems.

h. Adversaries will often find niche capabilities that mitigate technological advantages or resort to low tech approaches that stymie modern devices and efforts.

i. The rapid dissemination of mass media reports will affect the operations security of the future Modular Force and pose limitations across the full spectrum of operations.

j. Multi-national cooperation can be both additive and a limitation in battle command, additive in terms of combat power, diplomatic reinforcement and potentially unique capabilities. Despite extensive multi-national and coalition work and numerous agreements and protocols, true interoperability, particularly of C2 systems will likely remain a challenge.

Chapter 2
The Joint Operational Environment

2-1. Overview

a. Emerging cultural, religious, ethnic, political, and economic realities will greatly complicate the future geopolitical environment (see fig 2-1). The resulting mix of global strategic, operational, and tactical issues transcends borders and involves opponents with worldwide connections that will present a demanding combination of challenges and dilemmas for the U.S. Security challenges will be more varied and unpredictable and the range of operational settings within the spectrum of conflict considerably more complex, driving an expectation that U.S. military assistance in civil support operations and stability operations will continue to rise. The future Modular Force will encounter unprecedented complexities in physical terrain (especially urban areas), demographics, and informational environments. The allegiances of many entities within the operational environment will be difficult to determine. While some may clearly be neutral, others will be "gray," opposing certain U.S. efforts while supporting others. Strategic deployments to areas of conflict will involve long logistical trails and the need to operate in regions with poor infrastructures. U.S. resources could be extended beyond the historic bounds of the task, and the range of military operations in those settings will be much wider than in the recent past.

Figure 2-1. The Joint Operational Environment

b. The National Defense Strategy and the CCJO postulate four primary security challenges for the future: traditional, irregular, catastrophic, and disruptive. *Traditional* (conventional) operations conducted within a state-on-state framework will continue to be relevant in the future environment. Regional aggressors will continue to modernize conventional forces and invest in capabilities that will enable them to dominate their neighbors. *Irregular* (unconventional) warfare may be conducted as the principle choice of adversaries who are overmatched in size or military technologies, or these kinds of operations may be combined with conventional capabilities to present an even more complex threat. *Catastrophic* challenges involve the acquisition, possession, and use of weapons of mass destruction (WMD). Adversaries seek such capabilities to dominate their regions, deter external intervention, or both. *Disruptive* challenges may occur through the employment of breakthrough technologies to negate existing U.S. advantages in key operational domains.

c. The most dangerous future adversary would be one that combines capabilities in all four challenges in creative ways, adapting them before and during the course of a conflict to frustrate U.S. military action. Opponents will attempt to use these capabilities to exploit perceived vulnerabilities, especially our dependence on networked command and intelligence, surveillance, and reconnaissance (ISR). Opponents will also attack America's relationships with host and supporting nations, the media, commercial interests, and multi-national or interagency partners. U.S. development of the intellectual capital that will power

a culture of innovation and adaptability potentially represents the most effective response to combinations of threats that cannot be predicted.

d. Additionally, the future Modular Force will face increasing complexity in its own operations. Given the expectations outlined above, strategic and joint guidance unequivocally establishes full spectrum dominance, the defeat of any adversary or control of any situation across the ROMO, as the overarching goal of joint transformation and JF development. Thus, it is imperative that the future JF and the Army are fully prepared to be effective across the spectrum of conflict and in the conduct of full spectrum operations throughout the course of a future campaign.

e. The future Modular Force will fight as a part of a networked joint force, integrated at every level, and interdependent in the joint areas of battle command, force projection, air and missile defense, sustainment, and fires. Exploiting the full potential of tomorrow's technical capabilities will require an unprecedented breadth and depth of technical and tactical skill, individual and organizational flexibility, and personal initiative and creativity pitted against thinking, adapting adversaries. Speed, simultaneity, distribution, and the ability to conduct multidimensional, continuous operations over extended distances will be mandatory to gain the initiative and allow for ultimate success. As future adversaries gain additional capabilities to directly threaten U.S. territory, U.S. military forces will become increasingly involved in homeland security in addition to executing challenging missions abroad. The future Modular Force must also fully integrate its operations with its interagency and multi-national partners, exploiting the strengths that those partners provide while minimizing any limitations and vulnerabilities.

2-2. Future Operational Challenges[4]

a. The *Battle Command* concept contributes to the Army's ability to meet the challenges of full spectrum dominance in the future operational environment. The predominant feature of the future is complexity, complexity in environments, complexity in enemy forces, and complexity in friendly operations.

b. The *traditional* challenges will call for advanced C2 and information systems. *Irregular* challenges will require increased versatility and agility and an ability to detect patterns that defy easy detection. *Catastrophic* threats will pose challenges to readiness and planning that will require C2 efforts that are flexible and responsive across widely separated forces. *Disruptive* challenges demand innovation and adaptability in battle command.

2-3. Enemy Forces

a. Enemy forces will most likely emerge with some combination of traditional, irregular, catastrophic, and disruptive capabilities. On the future battlefield opponents will attempt to use these capabilities to exploit perceived vulnerabilities, especially our dependence on

[4] See Army Capstone Concept, p. 4-9.

networked command and ISR, so vital to the U.S. synergistic, system-of-systems approach to warfare. Opponents will also attack America's relationships with host and supporting nations, the media, commercial interests, and multi-national or interagency partners.

b. To accomplish those tasks, future adversaries will employ special purpose forces, long-range strike, weapons of mass effects, terrorism, irregular warfare, and information capabilities. They will take advantage of the terrain and weather maximizing their knowledge of the environment and attempting to minimize U.S. advantages. If immediate tactical success is out of reach, adversaries will seek to preserve their military forces, taking maximum advantage of complex informational, human, and physical domains. Through the employment of niche advantages to deny rapid decision, the enemy will attempt a strategy of protraction and exhaustion to degrade the Nation's will, fracture its alliances and coalitions, and limit the scope of American involvement.

2-4. Friendly Forces

a. The future Modular Force will face increasing complexity in its own operations. It will fight as a part of a networked JF, integrated at every level, and interdependent in the joint areas of battle command, force projection, air and missile defense, sustainment, and fires. Exploiting the full potential of tomorrow's technical capabilities will require an unprecedented breadth and depth of technical and tactical skill, individual and organizational flexibility, and personal initiative and creativity pitted against thinking, adapting adversaries. The growing importance of space-based and space-enabled capabilities, for example, will clearly enhance the accomplishment of battle command. Speed, simultaneity, distribution, and the ability to conduct multidimensional continuous operations will be mandatory to gain the initiative and allow for ultimate success.

b. As future adversaries gain additional capabilities to directly threaten U.S. territory, U.S. military forces will become increasingly involved in homeland security in addition to executing challenging missions abroad. The future Modular Force must also fully integrate its operations with its interagency and multi-national partners, exploiting the strengths those partners provide while minimizing any limitations and vulnerabilities.

c. Friendly and enemy forces operate in a given environment that consists of weather, terrain, information, socioeconomic factors, infrastructure, host/supporting governments, non-combatants, and other factors. These elements of the environment do not exist in isolation, but rather influence each other to define the environment. Future Modular Forces coordinate and synchronize their operations within a JIM framework. As these friendly forces and enemy forces plan and execute military operations against each other, they both attempt to take maximum advantage of the environment. In addition, these military operations have both positive and negative impacts on the environment, causing both friendly and enemy forces to reevaluate their operational settings. The result is a future battlefield of complexity, fluidity, and uncertainty.

2-5. The Human Dimension

a. Battle command is clearly a human endeavor. It is a combination of art and science applied by leaders trained and educated to practice C2 functions for Army future Modular Forces. Practicing the art of military C2 requires more than training and education. Battle command requires commanders schooled by experience in actual operations and exercises over a period of many years. Control relies more on the science than the art dimensions of command. It is enabled by technical systems that link forces together in time and space. It is not exclusively mechanical for it depends on judgment and the art of articulating a force and coordinating its elements. The combination of the art and science of command includes an ability to see, model and anticipate an enemy's actions and plans. In the high paced, high pressure environment, there is the equally human challenge of maintaining morale, one of the tasks Patton cited as the most important for commanders, second only to accomplishing the mission.[5]

> You may think that you will go to war and just do kinetic operations, but, in fact, if you are going to be effective in the 21st century, you will have to plan for and employ social, political, economic and information operations. Those are a piece of everything that's done, right down to the individual soldier level.
>
> LTC David Hubner, 1st Battalion, 77th Armor, *Army, June 2005, p. 26.*

b. Additionally, there is an ever present moral dimension in military operations that calls for discrimination in the application of the destructive power of lethal force. Commanders must master the human dimension of C2 through their presence, for example, and adherence to the laws of land warfare.

2-6. Joint Operational Framework

a. Campaign planning will likely change and adapt in the future, and the elements of the joint operational framework will evolve as well. The joint construct of four overlapping phases presents Army future Modular Force commanders at all levels a clear analytical framework for both planning and execution. These phases: *prepare and posture, shape and enter, conduct decisive operations, and transition*, will enable commanders to consider the end state and structure plans aimed at that goal. Diplomatic, informational, and economic considerations of the elements of national power join the military element from the Soldier to the highest level of command.

b. Joint Publication 3-0, specifies the following six phases: *shape, deter, seize initiative, dominate, stabilize*, and *enable civil authority*. To preclude conflict with the Army capstone concept which predates this new phase titling, and to reduce the apparent rigid sequentiality of this new joint construct, the *Battle Command* concept is retaining the phases as stated above until revision of TP 525-3-0, *The Army in Joint Operations.*

c. For concept purposes p*repare and posture* encompass the two distinct joint phases: *shape and deter*. Similarly, *shape and enter* include elements of the joint s*hape* and s*eize*

[5]Farago, Ladislas, *Patton: Ordeal and Triumph.* New York: Ivan Obolensky, 1964, p. 200.

initiative phases. It is here that the issue of sequentiality arises in the implication that shaping stops at the end of what the Joint Publication labels Phase 0. In fact, shaping is a continuous effort that only begins in Phase 0. The same issue arises in joint Phase 2, *seize initiative*, which, if perceived as a discreet one-time event, would be inconsistent with a more fluid concept of blurred, often restarted or repeated phases. The Army *conduct decisive operations includes* Phase 2 and parts of Phases 3, 4 and 5. This is again a reflection of the blurring effect of over and underlapping efforts in any phase labeling scheme. *Transition* as used in Army concepts can overlap *dominate, stabilize,* and *enable civil authority.*

d. The joint operational environment as described in this chapter makes clean divisions between different types of operations nearly impossible. While that is not the intention of the joint construct, the Army capstone, operational, and *Battle Command* functional concepts retain the earlier labels to reduce inferences of sequential planning and execution in the joint operational framework.

2-7. Joint Organizations

a. Army future Modular Forces will be part of capabilities based JFs crafted according to the needs of the mission. These forces will frequently constitute joint task forces (JTF) often under functional joint C2 echelons. Army future Modular Forces may serve as the JTF headquarters or be subordinated to another service or multi-national headquarters depending on the situation and the scope of the mission. When operating as part of a coalition the JTF becomes a coalition joint task force (CJTF) with appropriate representation from coalition partners.

b. These joint aspects differ from current and past practices largely in the routine manner in which they will be practiced. They place a demand on Army commanders and their staffs to learn and understand other Services, agencies, organizations, concepts, capabilities, and cultures, as well as those of coalition partners.

2-8. Joint Interdependence

a. Joint interdependence is the "reliance of each service on the capabilities of others to maximize its own effectiveness, while minimizing its vulnerabilities."[6] The key joint interdependencies listed in the Army capstone begin with Joint Battle Management,[7] which calls for integrated joint battle command information systems and ISR systems capabilities to gain information superiority, share a COP, enhance joint-integrated information operations, and improve the ability of JF and component commanders to plan, execute, and assess operations.[8] This partial listing of joint interdependency imperatives highlights the importance of frequent training, exercises, experiments, and actual operations in order to develop commanders and staffs of all services who fully understand the interdependent nature of future operations.

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[6] Army Capstone Concept, p. 13.
[7] Note that this is different from Joint Battle Command in TP 525-3-0 based on this joint document that uses "management" rather than command: *Overarching Operational Concept For Global / Joint Battle Management Command and Control (GJBMC2) Version 9M DRAFT,* 20 April 2005.
[8] TRADOC Pam 525-3-0, *The Army in Joint Operations*, p. 14.

b. Key Joint Interdependencies Categories:

(1) Joint battle management transformation requires the development and fielding of integrated joint battle management C2 capabilities to enable U.S. forces to share an accurate picture of the operating environment.

(2) Joint fires and effects are integrated and vital to mitigating risk. Freeing commanders from reliance on organic fires requires absolute dependence on joint fires. Joint fires interdependency involves ensuring timely support, and optimizing the overall capability of the JF within a distributed operational environment.

(3) Joint force protection requires current and projected suites of strategic lift capabilities are insufficient to meet DOD swiftness goals for strategic responsiveness of the JF as a whole within the force planning construct. The future joint operational environment and emerging Army and joint concepts demand significant improvement in the operational agility of the JF via vertical maneuver.

(4) Joint sustainment demands shift in the joint operational environment to transition from Service-centric, supply based, regionally focused logistics systems to a single, fully integrated, globally synchronized, end-to-end distribution based system capable of providing agile, precise, responsive support to tailored expeditionary JF conducting distributed operations.

(5) Joint air and missile defense is a requirement as the threat capability to deliver WMD effects increases the need for a fully networked, interdependent, joint theater air and missile defense network of space, air, sea, and land based elements. This network must provide very high confidence protection beyond the JOA to include regional coalition forces.

c. Exercising effective C2 that exploits the synergy of dissimilar Services' capabilities while overcoming seams and gaps in those same Services will be a product of experience, maturity, and judgment.

2-9. Speed and Simultaneity

a. Driven by the operational environment the future Modular Force will operate with unprecedented speed, in multiple places, with several levels of action and intensity occurring simultaneously. Such an increased operational tempo will divide commanders' attention, increasing their reliance on subordinates operating within the commander's intent.

b. Current deliberate and crisis action planning methods and the means to translate them into timely orders, may not meet this challenge, which will approach the limits of both human and technological capabilities of the future.

2-10. Multidimensional Operations

a. Multiple lines of operations drive commanders to develop decentralized C2 solutions and strong reliance on mission command and self-synchronization. Like speed and simultaneity, multidimensional operations imply actions and activities distributed in time and

space. Land operations, for example, are not strictly land-based now, let alone in the future.

b. The proliferation of unmanned aircraft systems under the control of land commanders along with other aerial and space systems, manned and unmanned, competing for bandwidth and airspace, contribute to the complexity facing future commanders.

2-11. Multi-national and Interagency Operations

a. Army future Modular Forces will find themselves not only in a joint operational environment (JOE), but also in operations with multi-national partners or other agencies. New information security processes and techniques will be required to share information with international organizations, non-governmental organizations (NGO) and private volunteer organizations to preserve sources and collection methods, while promoting interagency interoperation. This creates tremendous challenges to the battle command function beyond the obvious C2 system interoperability issue.

b. Cultural differences extend beyond language and training to methodology and values. On the command level, this demands flexibility and adaptability in thinking and communicating. It also calls for an in-depth understanding of the organizational culture, and an ability to build consensus. On the control level it requires considerable trust bolstered by carefully developed procedural agreements.

2-12. Technology and Competitive Learning

a. The constellation of systems that will enable C2 include the Army's LandWarNet contribution to the global information grid (GIG) and the CIE.[9] Far more than simple communication links, the LandWarNet will incorporate portions of the CIE. In the fight for information, technology will enable the fusion of data derived from multiple sensors and assist in filtering it, so that it arrives at the right place as information ready to be converted into knowledge.

> However, discussions of NCO [Network-Centric Operations] tend to place emphasis for command and control on the 'gizmo' (i.e. the tool) rather than on the person using the 'gizmo.' The 'network-centric' concept introduces a dangerous *temptation to shift responsibility for making military decisions from commanders to the systems themselves.*
>
> *LTG Wallace*
> *RUSI Defence Systems,*
> *Spring 2005*

b. Technology will speed decisionmaking and populate the COP, but the art of command in an environment in which our adversaries pore over the same information in attempting to outsmart us will demand more than technology. Competitive learning in the C2 domain is akin to chess. It involves demanding training and education for leaders, as well as, frequent challenging exercises and operations to develop commanders and staffs capable of operating within the enemy's "observe, orient, decide, act" (OODA) loop.[10]

[9] See *Joint Command and Control Functional Concept, v1.0*, p. 30.
[10] Ibid., App B, p. B-1.

2-13. Cultural Awareness

a. Throughout the American Army's long and distinguished history, cultural awareness of both the enemy and the populace, has lagged behind more concrete assessments of the terrain and other environmental considerations. The strength of intelligence preparation of the battlefield processes began to close this gap, but the U.S. military often failed to understand its impact on the population of the places where it operated. Noble efforts to inform deploying Service members are well documented for our most recent conflicts, but the complexity of the future operating environment, and the strategic implications of missteps that alienate neutrals, turning them into hostiles call for redoubling our efforts to obtain and maintain cultural awareness. This is a long-term requirement and investment, if the U.S. is to instill more than a very fundamental understanding of the societies and mores of the varied peoples, with which we may have to interact.

b. Language training, for example, takes time and practice. Regardless of how well we can prepare future Modular Force personnel for the full array of potential places and cultures on unforeseen horizons, we must commit to increasing levels of cultural sensitivity and awareness, if we are to achieve lasting success.

Chapter 3
The Central Idea

3-1. Operational Problem

a. Increasingly complex combined arms operations, executed across the full range of military operations, distributed throughout the JOA, will place high demands on future Modular Force commanders. Operations with joint and multi-national forces along with a mix of current and future organizations, and systems with varying degrees of interoperability, will exacerbate this challenge. The increased requirement to integrate and work closely with interagency, non-governmental and other civilian agencies in all operations will place additional demands on future Modular Force C2 systems and will further challenge future Modular Force leaders.

b. All levels of command will face this same expanded challenge as the boundaries between strategic, operational, and tactical levels of war continue to blur. Adaptive, thinking adversaries will confound simplistic traditional military approaches by fighting asymmetrically in order to avoid defeat while attempting to prolong conflict and outlast our will to fight. Advantages anticipated from improved SA, fed by information systems incorporating, filtering, and fusing human and sensor input must be designed and integrated, so they do not inadvertently overwhelm commanders.

Notion of Battle Command

Battle Command is *the authoritative direction of Soldiers in combat with an adaptive, thinking and learning adversary*. Battle command is an art, underpinned by a science. Battle commanders require strong character, competence in the art and science of sustained operations, and leader skills that enable them to meld the efforts of subordinates and colleagues into harmonious unified actions and operations to accomplish assigned ends.[11]The functions of battle command are timeless. Battle commanders must anticipate, plan and execute combat operations and exploit or consolidate success. To do this they must *visualize* their situation and battlespace, and *imagine* a set of actions to use the resources at hand to achieve their desired ends. They must *describe* the series of actions intended for subordinate elements and desired from separate agencies capable of contributing to effective efforts to achieve shared ends. Battle commanders must then *direct* subordinates and influence collateral actions, to harmonize efforts in execution so the greatest possible effectiveness results at least cost. All the while, they must remain sensitive to their environment and anticipate possible challenges, opportunities and likely future missions.

The battle commander brings his character, competence and leader skills to the job, based upon talent and prior professional development. The institution provides organizations, procedures and tools, to help the commander perform his functions of anticipation, planning and execution by enhancing his abilities to visualize, describe and direct. These organizations, procedures and tools, constitute the *control* system of any organization. They exist only to serve the battle commander. Where battle command is essentially a human art, control is based largely on the science of systems and the ability to acquire, manipulate and communicate *direction* and *information* on the quantifiable variables which make up a military solution—useful data on environment, friendly and enemy capabilities, intentions and actions; coordinated effects; time; distance; tempo; and endurance (force sustainment).

Control is not Command but it is an essential enabler at all levels of battle command. The Battle Command system consists of a battle commander and the control system provided to facilitate his exercise of authority to impose his will on the situation. A Concept of Battle Command must take cognizance of both elements.

General (USA Retired) Frederick

3-2. Solution Synopsis

a. Future Modular Force commanders must exercise the art of battle command using the best available information in an uncertain environment to make tough decisions that put Soldiers' lives on the line.[12] The commander must be the focal point of decisionmaking and execution within military operations. The role of the staff, and supporting technological aids, is to support the commander in achieving SU, making decisions, disseminating directives, and following directives through execution. SU requires the commander to apply his skilled judgment, and that of their staff, to interpreting information in the context of the mission, the higher commanders' intent, and visualization of the end state of the mission, and to apply that interpretation to improve the likelihood of mission success.

b. Inevitably, even with net-centricity, there is more data and less information than one would like to have. Efficiently converting data to information and actionable knowledge is a function of command, enabling a commander to apply experience, and depending on the level of command and time available, the appropriate elements of operational design to identify feasible solutions. Leaders must learn how to take advantage of improved information availability, processing, and distribution to achieve the best possible SA and

[11] While not strictly in accordance with the FM 3-0 DRAG definition of Battle Command, this definition is essentially the same.
[12] Wallace, William S., Lieutenant General, *Network-Enabled Battle Command*, RUSI Defence Systems, Spring 2005, p. 22.

manage the challenges engendered by the increased complexity and expansiveness of command. This calls for adjustments and improvements in both technological capabilities and human processes.

c. Gaining and maintaining a COP at all levels will facilitate mission orders and foster commanders capable of acting in consonance with the higher commander's intent. Developing graphic display aids and cognitive skills enable commanders to visualize the operation, and describe it in terms of intent and guidance, which is central to the command concept. Developing processes into direct actions within the intent, becomes the means to insure control, while allowing the commander and subordinates time to quickly react to expected and unexpected events.

d. Key Ideas

- Centrality of the commander
- Role of the commander: framing, planning, preparing, executing, assessing, and reframing operations
- Mission command
- Self-synchronizing forces
- Collaborative planning and accelerated MDMP
- Decision superiority; central, critical role of high SU and COP
    - Continuous battle assessment; incremental adjustment to operations during execution
    - Adaptive C2 processes and structures, expanding span of control, and virtual staff
    - Red Teaming
- Single, integrated Army battle command system(s), joint capable to lower levels
    - The network
    - Interagency and multi-national interoperability and integration
    - Horizontal and vertical fusion
    - Ubiquitous, redundant, continuous communications network

3-3. Centrality of the Commander

a. Centrality is an essential key idea in any discussion of the function of command and control. The individual occupying a command position, regardless of the level of command, is the person responsible for all the command does or fails to do. The commander performs the vital analysis resulting in decisions and orders to subordinates. The commander continuously assesses the situation in order to see the need for new orders and then decides when and where their direct presence and personal influence is necessary.

b. Commanders will employ deputy commanders, staff, and all the tools at hand to make the most informed decisions and issue the best possible instructions, in clearly worded intent statements, but the authority and responsibility rests with the commander. This key idea establishes the foundation for all other battle command key ideas.

3-4. Role of the Commander

a. A natural extension of the idea of the commander's centrality is the role that commanders must play. In this expanded role (see fig 3-1) the commander's task of leadership runs parallel to the continuous process of assessment. The expanded role of the commander calls for an integrated approach to understanding, visualizing, describing, directing, assessing, and reframing operational problems. In situations where the commander must first structure a problem, such as in irregular warfare, his role expands to include the function of understanding.

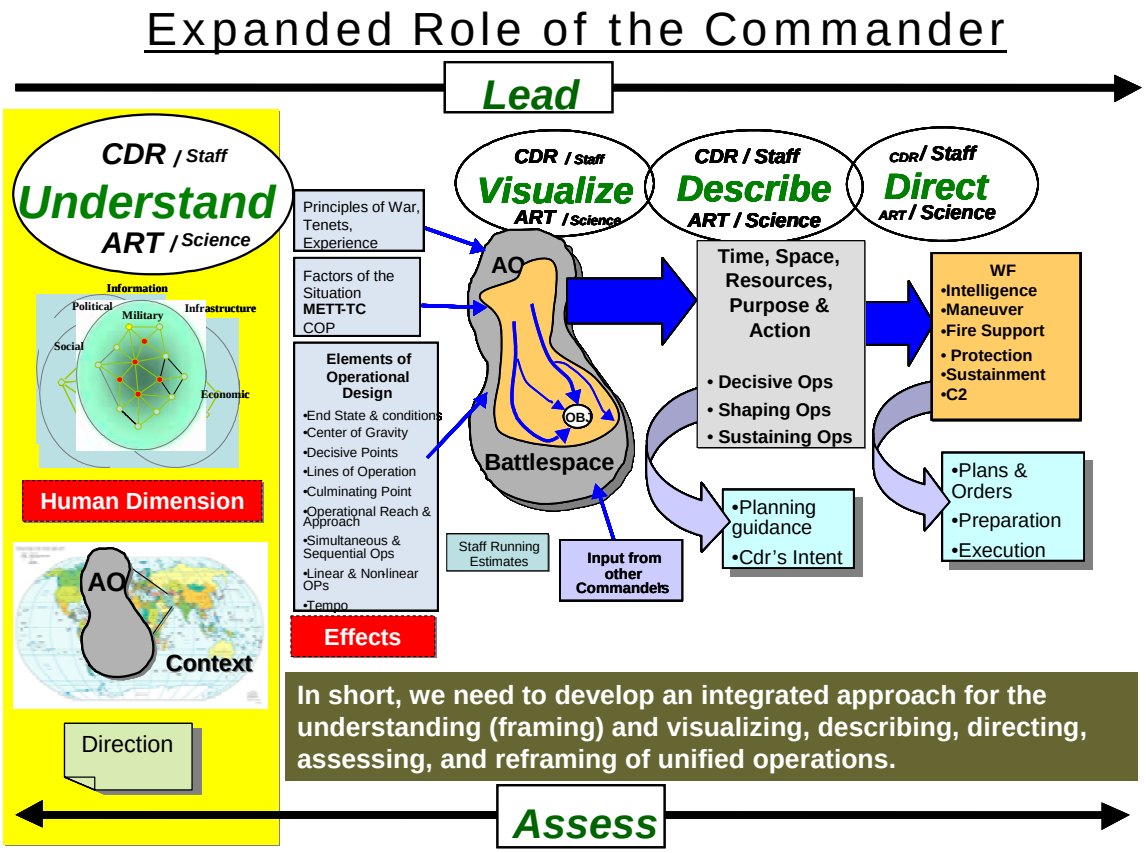

Figure 3-1. Expanded Role of the Commander

b. This blending of the art and science of operations in the battle command function is both complex and difficult to achieve without extensive training, education, and experience. There are tools for the commander to frame the existing conditions comprising his environment in order to analyze a problem which he must then solve. At the operational and strategic levels, the commander frames the existing conditions by interrelating political, military, economic, social, informational, and infrastructural elements from the perspective of friendly forces, the adversary's perspective, and the perspective of relevant third parties. At the tactical level, commanders consider the factors of mission, enemy, terrain and weather, troops available, time available, and civil considerations (METT-TC)[13] with respect

[13] This acronym, well known throughout the Army, is a very comprehensive memory aide.

to friendly forces, enemy forces, and terrain (physical and human). By relating the elements to form an integrated whole, the commander achieves a level of understanding of the existing conditions, which is a necessary precursor to visualizing, describing, directing, leading, and assessing. Framing usually occurs before planning and during execution as part of the assessment process where it is referred to as reframing.

c. In summary, the commander must first understand the situation and then apply the intellect to structure, identify, or articulate the problem. This contributes to the ability to visualize how they see the conduct of full spectrum operations of their staff and subordinates, and then determine the balance between the sciences. As in any two dimensional diagram this role or process appears to read linearly from left to right, but in fact, it is anything but linear. The commander and their staff are almost always at multiple points in this process which must be continuously updated, restarted, or refreshed in order for the commander to effectively command.

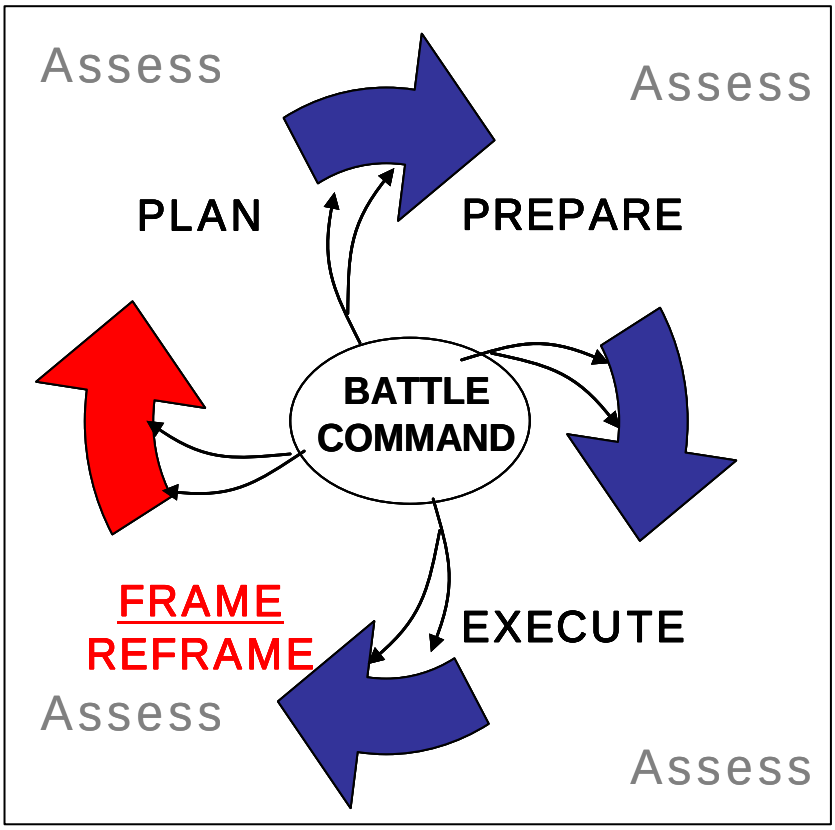

Figure 3-2. The Operations Process

d. Figure 3-2 depicts this process of framing and reframing as part of the operation process. Commanders must place their C2 system into action throughout the operations process. The operations process of framing, planning, preparing for, executing, and continuous assessment are cyclical and continuous. They do not necessarily occur

sequentially. For example, while preparing for or executing one operation, units plan branches and sequels for the next operation. At any time, subordinate units of the same command may be performing different operations process activities. For example, one company of a battalion may be engaged in offensive combat while others are performing stability operations or humanitarian assistance within the battalion's area of operations.

3-5. Mission Command

a. Mission command, the need for subordinate leaders at all echelons to exercise disciplined initiative *within the commander's intent* to accomplish missions, requires leaders capable of operating in an environment of uncertainty and rapidly changing operational conditions. Mission command is a time-tested U.S. Army doctrinal idea that allows units to self-synchronize their actions in the absence of direction. Obtaining this complete understanding of the higher commander's intent is enhanced by collaborative planning and accelerated decisionmaking processes.

b. Critical to mission command and self-synchronization is enhanced SU. It is imperative for future leaders to be trained and equipped to issue timely, clear intent statements, so that their subordinates can take the initiative and effectively self-synchronize.

3-6. Self-Synchronization

a. Self-synchronization, the ability of subordinate commanders and staffs to adjust to the situation without direction, derives from mission command. It means synchronizing forces and functions on a distributed battlefield within and between widely separated units. This will produce more precise application of combat power at the right places and times as an operation unfolds. It will also enhance mutual support and protection, and facilitate timely re-supply through cross leveling, when necessary. The essential point is that subordinate commanders know and are encouraged to think and act independently within their superior's intent. This includes deciding on and applying tactics for immediate actions without direction.

b. Modern technological tools help achieve self-synchronization; however, it starts with Soldiers exercising initiative guided by their knowledge of the commander's intent. SU for staff members entails knowing how factors in their area of expertise affect other areas. It underlies the collaborative aspects of self-synchronization needed to effectively exploit opportunities commanders discern. Self-synchronization occurs without direction from higher headquarters or their commander. It requires subordinates to inform other affected commanders or staff sections of their decisions and actions. It also requires monitoring their counterparts' decisions for implications that affect their areas of expertise. Doing this allows them to resynchronize their functional area activities. This exercise of subordinates' initiative results in collaborative synchronization of the force.

3-7. Collaborative Planning and Accelerated MDMP[14]

a. The CIE offers a means for commanders and staffs to conduct both collaborative planning and execution of plans. It will allow commanders to draw upon other commanders, joint resources, terrain, and environmental effects through the leveraging of geospatial technology and information databases, home station operations centers, and live and virtual staffs. This ability to collaborate in assessing courses of action, visualizing potential outcomes, making decisions, and developing and disseminating plans will enhance the speed of planning and execution. It will also enhance the ability to control operations widely separated, in both nature and time, and space simultaneously.

b. Even the most talented and experienced commanders will overlook something critical if they do not draw on every available resource. Accelerated collaborative multi-echelon planning can streamline the classic MDMP and increase SA which can, in turn, result in better and timelier decisions. Other future variations of MDMP combined with training, practice, and experience, enabled by advanced decisionmaking tools that can operate in dynamic and uncertain information environments can further accelerate planning and execution of actions. The commanders' intuition and application of operational art retains validity in the future, but is enhanced by the ability to draw from multiple echelons and disciplines in developing a viable course of action. This increases the commander's ability to recognize patterns in the enemy's actions leading to more rapid selection of COAs or decisions about anticipated branches or sequels to the plan. Just as critical is the commander's ability to know and understand the disposition, capabilities, and intent of other friendly forces (including joint and multi-national partners) and the capabilities and plans of non-DOD agencies, international organizations, and private volunteer organizations functioning in the operating environment.

c. The idea of embedding trained devil's advocates or *red teams* (see para 3-8f) on planning staffs contributes to both the art and science of planning and decisionmaking. Experienced and trained red team members take the perspective of the adversary and suggest what moves or countermoves the adversary is likely to take for any given action by the friendly force. This is more than second guessing or traditional analysis of the available intelligence material. It is akin to inviting a thinking adaptive adversary into planning sessions to suggest what their reactions are to the friendly intentions. It is an extension of the idea of wargaming courses of action currently associated with the MDMP. Obviously there is an inherent danger of overwhelming commanders and staffs and producing inertia rather than accelerated decisionmaking, requiring careful handling and processing of information. This challenge flows into the next key idea.

3-8. Decision Superiority

a. Decision superiority plays a central, critical role in attaining high SU, and a common operational picture. Decision superiority, the ability to decide and direct action before an adversary can react, depends to a great degree on obtaining and maintaining SU. Obtaining,

[14] See FM 5.0, *Army Planning and Orders Production*, 05, for a full description of MDMP.

processing, and disseminating the information that enables SU and the COP or intelligence running estimate is the domain of the *See* functional concept. All staff sections conduct running estimates and provide information that contributes to the COP and to improving SU.

b. Enabling effective decisionmaking will require an aggressive persistent fight for timely, high quality, and relevant information. Commanders will conduct routine command assessment using flexible processes, adaptive thinking, timely and clear guidance, and decisions that are relevant in a fast moving physical and cybernetic environment. Battle command will focus on interoperability to generate desired effects through linking sensors, delivery systems, and effects across the JIM environment. Battle command activities will support the planned and dynamic execution of Service component operations. They will also document the dynamic planning and assessment activities associated with the execution of air, land, maritime, and space operations.

c. Battle command requires an integrated view of the operating environment, one that combines accurate knowledge of self, knowledge of the environment, and knowledge of the enemy in order to plan, decide, and execute. These knowledge areas are delivered to the COP, where they are fused and presented according to the needs of the commander.

(1) *Knowledge of self* permits commanders to plan, decide, and act rapidly and with assurance. High tempo operations demand timeliness and accuracy of all friendly force information, including JIM partners, locations, mission, future missions and activities, and capability status. Factors, such as force tracking, timing, endurance, and condition of the force combined with human aspects, for example, confidence, fatigue, moral superiority, and shock are important aspects of knowledge of self. Personal dynamics and the character of commanders are leadership factors that also figure importantly in self-knowledge.

(2) *Knowledge of the environment* has always been and will remain a key determinant in conducting both operational and tactical operations. Commanders' knowledge of the terrestrial, air, and space domains, in addition to weather will remain critical in planning and executing operations. Not only will commanders' knowledge of the physical, and virtual (cyber and informational) domains continue to play key roles, but their knowledge of the human domain is increasingly important.

(3) *Knowledge of the human domain* will most likely include international organizations and private volunteer organizations which may insist on being neutral or impartial in a conflict. These groups may therefore be extremely hesitant to provide commanders with information on their locations, capabilities, and intent. The human domain also includes the complexities of other non-combatants. In any given area of operations, the local population will consist of groups and sub-groups that may be supportive, neutral, or hostile to the future Modular Force. These attitudes could change based on friendly and enemy actions. Future commanders must be keenly aware of how these non-combatants affect mission accomplishment.

(4) *Knowledge of the enemy* is perhaps the most challenging and critical of the requirements for commanders to have in order to succeed. Opponents will be forced by U.S.

capabilities to attempt to avoid detection, increasing the challenge in acquiring knowledge of the force. Enemy organizational and operational designs will often complicate the future Modular Force's ability to transform information into knowledge and knowledge into understanding. This capability can be developed and enhanced by embedding red teams in headquarters and staffs.

(5) These knowledge areas only have meaning when understood in relation to each other, especially knowledge of self and of enemy. The COP assists the commander in articulating and gathering information in support of their commander's critical information requirements (CCIR). Forecasting is another subset of decision superiority. The COP should be developed to include products derived from running estimates to visually forecast progress, events, and outcomes. Eventually all running estimates will develop products to provide input to the COP electronically.

d. Continuous battle assessment is incremental adjustment to operations during execution and is a subset of decision superiority. Adaptation to changing situations and providing a continuous update to the COP will facilitate mission command. Commanders and their staffs must conduct a continuous renewal of the assessment of the factors of METT-TC. This implies an adaptive and predictive information supply, in which the commander has access to information relevant to the current mission goal and operational environment. Environmental considerations will take into account the potential impacts the environment can have on a commander's decisions, as well as, the operational impact on the environment.

e. Adaptive C2 processes and structures, expanding span of control, and virtual tactical operations center is another subset of decision superiority through which commanders, possessing an expanded view of the operating environment and enhanced C2 systems, can exercise effective command and control of dispersed, non-contiguous forces.

(1) Virtual TOCs and knowledge centers provide the commander with the advice and expertise of special and coordinating staff sections without requiring their presence in forward command posts. Commanders must capitalize on C2 echelonment and mobility of future Modular Force organizations in order to provide redundant continuous C2. Early entry and deployable command posts, mobile command groups, and efficient employment of deputy commanders, all factor in achieving adaptive dominance over the enemy. Capabilities, such as battle command on the move (BCOTM), en route mission planning, and rehearsal will become the norm in the highly fluid future operational environment.

(2) The ability to provide pervasive, extended range, intertheater, and intratheater global beyond line-of-sight communications relay capability and broadcast services between non-contiguous forces at the halt, at the quick halt, and on the move in all operational environments and conditions will enhance electronic connectivity. These communications include data, voice, imagery, and video available from the lowest tactical level to Army operational levels.

(3) The Army's current staff structures (G1/S1, G2/S2) emerged from its experiences in World War I. Since that time, staff structures have evolved to meet the needs of the

commander. All staffs (coordinating staff, special staff, and personal staff) and their procedures exist to make the organization, analysis, and presentation of vast amounts of information manageable for the commander. A disciplined and skilled staff improves the commander's ability to make the right decisions, at the right time. The staff is also invaluable to the commander in the control of subordinate units' execution of operations. Commanders of the future Modular Force will operate within structures and within environments that might be vastly different from those of today. Future commanders will be assisted by virtual staffs and knowledge centers. Teaming, coordination, and parallel planning with multi-national, interagency, and non-governmental organizations will be much more routine.

(4) Advances in joint interdependencies will allow for fully integrated joint operations at lower tactical levels. Distributed operations will demand multiple mobile command posts that require deputy commanders and representatives from many staff sections. Future staffs, equipped with advanced technological tools, will acquire data, transform information, and provide knowledge and understanding about friendly forces, adversaries, and the environment. These profound changes demand that the Army scrutinize its current staff structures. Dedicated studies and experiments are necessary to examine if the size and structure of today's staffs will meet the needs of future commanders. If not, these studies and experiments must identify what new structures are required. Any revised staff structures will require significant changes in how the Army trains and educates its officers and senior non-commissioned officers and may even affect Army branches.

f. Red Teaming. Red teaming is defined as a function executed by trained, educated, and practiced staff members, who provide commanders an independent capability to fully explore alternatives in plans, operations, concept, organizations, and capabilities in the context of the operational environment from the perspectives of our partners, adversaries, and others. Its purpose is to improve planning and operations, and support decisionmakers in visualizing, describing, and directing operations to achieve mission accomplishment.

(1) Effective red teaming reduces uncertainty by enabling better knowledge of self, the environment, the enemy, and others entities found in the operational environment. Red teaming aids the understanding and visualization of the environment by the commander through the discovery and examination of alternative views of the elements of operational design to achieve assigned objectives.

(2) During planning, effective red teaming broadens understanding of the operational environment by assisting the staff in determining alternative views of the objectives and potential courses of action of adversaries, partners, and others in the environment. As part of the organization, but not tied to the planning staff, red teaming can aid the staff in identifying when group think, mirror imaging, and other errors in critical thinking are occurring during planning. Red teaming can assist the staff to validate assumptions and identify unstated assumptions being used during the planning process. Red teaming can assist in staff horizontal integration by identifying gaps, vulnerabilities, and opportunities not previously identified in the planning process.

(3) When supporting the intelligence staff, red teaming can provide alternative courses of action from the enemy's cultural perspective, which will result in an improved analytical product. Red teaming will also insure the enemy is appropriately portrayed in the wargame.

(4) During execution, red teaming can assist the commander in identifying when operational patterns are being established, and when opportunities or unintended consequences are occurring. Based on the commander's guidance, members performing the red teaming will participate in staff and functional boards, centers, and cells. Red teaming can assist in identifying the correct and cultural specific measures for an effective assessment system.

(5) When time constrained and conducting an accelerated MDMP cycle, red teaming may prevent the development of a plan based on flawed assumptions, an unclear end state, and an inaccurate understanding of the operational environment.

3-9. Single Integrated Army Battle Command System(s)

a. Single, integrated Army battle command system(s), joint capable to lower levels, utilizes the network that makes up the backbone of the future Modular Force. This knowledge-based *network of networks* enables decision and information superiority. It draws from and feeds all joint systems. This will sharply enhance the lethality, survivability, agility, versatility, and sustainability of the force; enabling more effective and timely application of the elements of combat power.

b. The *network* provides the critical infrastructure that ties all components of the JIM force together. Key space-based systems and space operations provide the space-based-links enabling access to the GIG. The GIG is the system that allows ready access and sharing of information from and between national, component, and multi-national partners of the force. The network-enabled environment is a framework for full human and technical connectivity, and interoperability allowing all users to share the information they need, when they need it, in a form they can understand and act on with confidence; it also protects information from those who should not have it. While many allies might share our ability to use the network, a robust liaison network remains critical.

c. *Interagency and multi-national interoperability* and integration will be the norm in the future Modular Force. Joint and Army battle command systems must take this into account in developmental programs, exercises, and actual operations in order to achieve coherent actions. This extends from the classic use of liaison officers to virtual liaison officers (similar to virtual staffs), and the exchange of system plugs that enable interoperability. Plugging multi-national or interagency partners into the network may be an optimal solution provided obstacles, such as training, language, and security can be overcome. The proven value of exchanging quality liaison personnel fully networked with their parent organizations will remain an enduring approach to interoperability. Clearly, the more Army leaders participate in multi-national and interagency operations, exercises, and exchanges, the more compatible will be our C2 processes.

d. *Horizontal and vertical fusion*, the process of combining and relating data to produce information, will contribute to improve SU across the force. Future systems and processes will fuse information gained through the *See* concept application, thereby contributing to the common operational picture for the commander. The knowledge acquired by the force is gathered and delivered to the commander based on his critical information requirements. Reaching back to knowledge centers, other elements of the joint or coalition force, and non-military sources of information will enhance the COP by adding specialized knowledge and interpretation of information essential to planning and execution, and reducing operational transitions and orchestrating force flow, sustainment, and force protection.

3-10. Summary

a. An agile, ubiquitous communications network enabled by an integrated system of terrestrial and space-based systems is the network vehicle critical to all aspects of the command function. A robustly networked force improves information sharing, which in turn enables collaboration and self-synchronization, and enhances sustainability and speed of command. Whatever the actual systems become, from three dimensional displays to instantaneous messaging, they will provide the means for distributing battle command capabilities among multiple distributed nodes to enable multi-echelon collaborative planning. The system enables BCOTM without degradation.

b. As the level of SU improves, so too will the tendency to attempt to micromanage operations. Future commanders, through training, education, and experience, must come to understand that, although centralization may sometimes be necessary; mission accomplishment will occur more successfully using mission command and mission-type orders.

Chapter 4
Future Modular Force Battle Command in the Joint Campaign

4-1. Introduction
Army operations within the joint campaign framework will employ the key ideas of battle command across all types and phases of planning and execution. This chapter uses a combination of both to describe the battle command function.

4-2. Prepare and Posture

a. Receiving a mission and performing mission analysis is the first step in the MDMP. For a given operation this process may be an extension of earlier planning, in which contingency plans can be updated and modified arriving at revised courses of action. In crisis action planning the *prepare* and *posture* phase might be compressed to a very short period of time. In either case, commanders envision the end state of a campaign or operation, and develop their plans with that end state in mind.

b. Decisions made before deploying forces become critical enablers to eventual engagement in operations. As mentioned in the previous paragraph, this calls for the ability to envision the whole campaign or operation. In one sense, commanders are in a state of continuous preparation and posturing of their forces for eventual employment. This again highlights the key idea of the centrality of the commander in virtually all phases and at all times.

4-3. Shaping and Entry Operations

a. C2 for *shaping* and *entry* operations consists of a combination of collaborative planning and synchronized execution. Army future Modular Forces rely on joint interdependency for most shaping efforts prior to land forces arrival. Future Modular Force commanders visualize the operating environment and use collaborative planning and accelerated MDMP or dramatically new processes that facilitate decisionmaking in the distributed, highly dynamic future operating environment. As a space empowered force, the future Modular Force will routinely exploit the constellation of military and civilian space platforms for persistent surveillance, reconnaissance, communications, early warning, positioning, timing, navigation, weather, environment monitoring, missile defense, and access to the GIG. Planning within the parameters of the joint commander's campaign plan requires detailed analysis by the Army commanders and staffs to nominate the most critical shaping actions and CCIR that will best support anticipated entry and follow-on operations. Shaping will likely change the operating environment requiring adjustments to plans. Maintaining an updated picture of these changes and enemy dispositions is part of the fight for information Army commanders must wage.

b. C2 for entry operations includes en route planning and rehearsal in a networked collaborative environment in which all Army commanders continuously adjust their plans and conduct virtual rehearsals. Deploying early entry command posts to positions close to or within the JOA are among the C2 options commanders will consider. Integration of corps and division command elements in the joint C2 architecture may mean co-locating Army C2 with other Service mobile airborne or at-sea assets. The key objective for entry operations will be to maintain a robust and unbroken network with assault forces in order to continuously update the COP and enable self-synchronization.

4-4. Operational Maneuver from Strategic Distances

a. All of the C2 considerations for shaping and entry apply directly to operational maneuver from strategic distances (OMSD). Indeed, joint support to both shape the operating environment and obtain SU from point of origin of deploying future Modular Forces to the point of entry is a critical imperative. Regardless of the mode of deployment, Army forces will need to be configured to enable en route planning and rehearsal to facilitate immediate employment on arrival. Any attachments or new supporting elements should be incorporated well before execution of OMSD and integrated in the planning from the beginning.

b. Commanders at all echelons, informed through the network and collaborative planning, adjust their operations to optimize success. Liaison teams and forward command

elements will play an important role in this and all phases of a campaign. Overcoming anti-access efforts in joint forcible entry operations (JFEO) is among the most challenging of combat operations on the ROMO. Accomplishing it over strategic distances places a very high premium on the network's ability to insure connectivity and provide continuous updates to the COP. This will be particularly important to ensure the successful orchestration of strategic transport assets in line with the operational plan.

4-5. Conduct Decisive Operations

a. If JFEO and OMSD are among the most demanding C2 challenges, effective operational or tactical maneuver are among most important to mission accomplishment. Future Modular Forces' extended coverage capabilities may enable wide dispersion of units in order to mass effects without massing forces. This places a tremendous demand on C2 differing from JFEO and OMSD only in METT-TC factors. The C2 focus shifts from planning to aggressive execution and continuous adjustment to maintain the initiative and momentum.

b. Decentralized execution of decisive maneuver will be enhanced by forces from Soldier to higher echelon commanders being able to possess as complete as possible, and in real-time knowledge, all facets of friendly and enemy force dispositions in a selective sector according to their needs. The networked force informed by the COP will be able to synchronize their actions during decisive maneuver.

4-6. Intratheater Operational Maneuver

a. All of the C2 considerations from the preceding discussions for shaping, entry and OMSD apply to intratheater operational maneuver. C2 within a theater of operations can be echeloned at the corps and division level in order to insure redundancy and extend the reach of the commander as it has been throughout Army history. The difference for the future Modular Force will be the rapidity with which commanders will need to reposition forces on a distributed non-contiguous battlefield. Command posts of the future will need to be capable of displacing without a break in connectivity with the network. Commanders will insure round the clock command capabilities through the use of deputy commanders and far greater use of automation solutions distributed through mobile or deployable command posts according to the demands of the situation.

b. BCOTM will be the norm, rather than the traditional leapfrog method of moving command posts. No matter how robust and redundant the C2 systems in the future, commanders at every level (and the information environments that support them), must anticipate interruptions in connectivity, especially during movements and maneuver. This inevitability drives the need for mission command by informed subordinate commanders knowledgeable of their superior's intentions and authority to act without direction. It reinforces the imperative of self-synchronization of operations between and within all echelons of the future Modular Force.

4-7. Transitions

a. C2 in an environment in which major combat and stability operations occur simultaneously, calls for the capability at every level to be able to discriminate between

hostile and nonhostile situations. Commanders will establish clear rules of engagement as they always have, but fully networked forces will enable them to make decisions collaboratively rather than relying solely on individual judgment. This capability includes combat identification systems that de-conflict friendly forces, enabling commanders to not only see *where* their units and elements are, but *what* they see.

b. Adversaries that resort to mixing with the population; using human shields; seeking sanctuary in protected places, such as schools, religious sites, and medical facilities, will challenge Soldiers and their leaders and call for a constraint in the use of deadly force. This necessitates enhanced means to track hostile combatants and detect threats. It will demand an unprecedented flexibility on the part of Soldiers and commanders to transition both mentally and physically between hostile and nonhostile actions.

4-8. Concurrent and Subsequent Stability Operations

a. Stability operations, like combat operations require timely decisions in order to protect the force and nonhostile populations. Among the challenges that a commander will face in this environment, the most critical will be decisions regarding the allocation of his resources among offensive, defensive, and stability operations. The COP must support the commander in developing as complete a SU as possible. With this SU, the commander can make wise decisions on what type and level of stability operations are required to accomplish their mission while complying with the higher commanders' intent.

b. SU will also allow the commander to assess whether to take risk in a particular area; for example, to temporarily postpone a large combat operation in order to conduct crucial stability operations, or to delay stability operations in order to engage in battle.

4-9. Distributed Maneuver Support and Sustainment

a. Distributed combat forces call for distributed maneuver support and sustainment and enhanced visibility of subordinate requirements at all C2 echelons. The COP must provide commanders with real-time visibility of their units' combat readiness and location, so timely decisions can be made in current operations and anticipated in future operations.

b. The effective application of mission command equally applies to support and sustainment functions. Subordinate support and sustainment organizations will be also bounded by a clear commander's intent that will allow the appropriate staff to act on their own initiative. This will ease the commander's burden of routine support matters and allow them to focus his efforts on more pressing issues in the distributed environment.

4-10. Network-Enabled Battle Command

a. All the preceding discussions highlighted the role and importance of the network in enabling C2. Network-centric operations are founded on the premise that if the JF fully exploits both shared knowledge and technical connectivity, then the resulting capabilities will dramatically increase mission effectiveness and efficiency.[15]

[15] Net-Centric Environment Joint Functional Concept, version 0.95, 30 December 2004, p. iv.

b. Joint concepts divide the net-centric environment in two areas, the Knowledge Area and the Technological Area, in which the Knowledge Area comprise the cognitive and social interactions, while the Technological Area is composed of the informational and physical aspects.[16]

Chapter 5
Required Future Capabilities

5-1. Introduction
The preceding chapters outline the *Battle Command* concept within the context of the 2015-2024 JOA and define the way future commanders will execute the battle command function in a joint campaign framework. This chapter addresses an array of capabilities to accomplish this function of battle command, along with likely changes required to implement these capabilities within DOTMLPF.[17]

5-2. Doctrine Capabilities

a. As future Modular Force concepts mature and joint and Army capabilities integration development processes evolve, new capabilities, tactics, techniques, and procedures will emerge. This will impact on battle command-related doctrine, such as the current Field Manual 6.0, *Mission Command: Command and Control of Army Forces*.

b. Specific capabilities derived from this function's key ideas include those below.

(1) The future Modular Force will require a clear articulation of the centrality of the commander and the role of the commander within the JIM environment, in order to enable commanders at all levels to fully exercise the battle command function.

(2) Future Modular Force commanders will require doctrinal solutions to improve the ability to perform the operations process of framing, planning, preparing, executing, assessing, and reframing operations in the JIM environment, in order to achieve decision superiority over adversaries.

(3) Future Modular Force commanders at all levels will require doctrinal solutions that include the development of tactics, techniques, and procedures that both describe self-synchronization in distributed, non-contiguous, and often non-linear environments, in order to facilitate coordinated actions within and between units.

(4) Future Modular Force commanders at all levels will require doctrinal solutions that include the development of tactics, techniques, and procedures for the exercise of

[16] Ibid., p. 2.
[17] See "materiel solutions" and "non-materiel solutions," CJSCI 3170.01E, Glossary.

adaptive C2 and the utilization of virtual staff and decisionmaking tools in the highly complex future JOE, in order to achieve accelerated decisions and rapid execution of orders.

(5) The future Modular Force will require a comprehensive doctrinal description of the exercise of collaborative planning and the development of improved processes in the highly fluid JOE from home station to points of employment, in order to execute and accelerate the current MDMP.

(6) Future Modular Force commanders and staffs will require doctrinal solutions to assess information superiority at all points of engagement in the JOE, in order to reduce ambiguity while managing risk.

(7) Future Modular Force commanders at all levels will require doctrinal solutions that include the development of tactics, techniques, and procedures for the employment of an evolving single, integrated Army battle command system functional in all JIM environments, and joint down to the Soldier level, in order to conduct complex operations in an coordinated and synchronized manner.

(8) Future Modular Force commanders at all levels will require doctrinal solutions that include the development of tactics, techniques and procedures in all phases of planning and execution of military operations in the JIM, in order to leverage mission partners.[18]

5-3. Organization Capabilities

a. The organizational implications for the Army derived from this functional concept are profound, calling for pervasive organizational innovation to enable the future Modular Force commanders in the JOE to-

(1) Achieve scaleable C2, frequent mission tailoring, force responsiveness and agility, ability to change missions without exchanging forces, deliberate and routine employment of joint resources, and general adaptability to changing battlefield conditions.

(2) Focus on the brigade combat team (BCT) and modular, brigade-based force structures for more effective mission tailoring and a means to resolve the readiness challenges and generate responsive forces, a continuous assessment of the Army force generation process.

(3) Employ combined arms organizations to battalion level, reducing the need to cross attach, and strengthening their ability to fight with cohesive teams, capable of operating initially under direct C2 of the JF headquarters in early entry operations.

[18] See *Command and Control Joint Integrating Concept Final Version 1.0*, 1 September 05, p. 23-27, for a full description of these capabilities.

(4) Improve strategic responsiveness and increase the number of BCTs while increasing their responsiveness and standardization, in order to meet the Nation's Defense Planning Guidance.

(5) Facilitate mission tailoring and flexibility by reorganizing combat service and combat support units into battalion and brigade-sized modular forces, better able to support distributed, non-contiguous future Modular forces.

(6) Provide operational level direction to Army forces within an Area of responsibility with theater Army, corps and division organizations that can, with augmentation, assume joint roles as the joint force land component commander (JFLCC) or JTF when appropriate.

(7) Provide C2 of Army, joint, and multi-national forces and be organized, designed, and equipped to fulfill C2 functions as the Army Forces component, JFLCC, or the JF.

(8) Employ force pooling, a component of the force tailoring process that enables the creation of pools of standing organizations (modular BCTs and support units), that can be combined into the temporarily established large formations described above for increased responsiveness and adaptability.

(9) Establish an organizational paradigm that will enable the corps and division to rapidly tailor the precise capabilities needed for each operating environment.

b. The Army force pools must be large enough to provide the flexibility needed for strategic responsiveness, and small enough to distribute the management challenge of force pooling across the Army overall in order to-

(1) Permit Reserve component organizations to be committed in the same fashion as Army component organizations.

(2) Create habitual associations within each force pool to establish a basis for more effective training, leader development, and readiness, without, however, constraining their operational employment.

(3) Reconcile sustainment requirements between current and future organizations in order to maintain uninterrupted support to the future Modular hybrid force.

(4) Establish joint operational level logistics headquarters to ensure that the combined, joint, and interagency organization receives the appropriate support.

5-4. Training Capabilities

a. Future Modular force commanders at all levels in the JOE will require the capability to develop innovative training solutions to-

(1) Enable Soldiers and leaders to execute C2, in order to deal with ambiguity while using every available tool.

(2) Provide challenging live, virtual, and constructive exercises to train leaders through the practice and application of leadership. Leadership can be taught to a degree in institutional settings (see para 5-6). It can be improved through observation and emulation of successful commanders, as well as through self study.

(3) Train and develop leaders skilled in reducing the complex into the manageable, to decide on appropriate actions, and to issue timely orders.

(4) Train and educate senior commanders at the battalion and higher levels in the operational exercise of command with emphasis on enhancing cognition skills to assist in decisionmaking, while accounting for the complex human dimension.

b. Further, the future Modular force will require the capability to develop training solutions addressing each of the functional concepts key ideas.

(1) *Centrality of the Commander.* From accession to retirement Soldiers must be inculcated with this essential principle. This is not a new idea, and will not be different in the future, though the future Modular force will require training solutions to-

(a) Provide company/team/troop level officers instruction in Army branch schools and career courses that prepare them for command. Battalion and squadron commanders normally select company level commanders who have completed this level of schooling.

(b) Insure officer training is synchronized at all levels, so the underlying principle of the centrality of the commander appears seamlessly and supports every other level.

(2) *Role of the Commander*. The operations process of framing, planning, preparing, executing, assessing, and reframing problems is complex and difficult to achieve without extensive training, education, and experience. This expanded role of the commander is not limited to operational levels of command.

(a) Future Modular force tactical commanders must learn to plan, issue orders, and direct the employment of their units using the factors of METT-TC.

(b) All future Modular force leaders will require training and education to emphasize the operational process in a progressive and continuous manner over a career in order to perform the C2 function successfully.

(c) The future Modular force personnel systems must access train and educate red teaming specialists capable of advising commanders at all levels, particularly at battalion and higher, in order to facilitate decisionmaking informed as thoroughly as possible to understand potential adversary reaction, as well as other potential consequences.

(3) *Mission Command.* Like centrality of the commander, mission command must be ingrained in training, so commanders at all levels are willing to trust their subordinates to

do what is expected in the absence of direction.

(a) The future Modular force will require training that places subordinates in complex JOE situations, in which they need to exercise initiative in order to succeed, and where their efforts are encouraged and supported.

(b) Future Modular force training programs and exercises must place commanders out of contact with their superiors for periods of time in which they can practice C2, be challenged to take risks, and evaluated on how well they follow the higher commander's intent. While commanders will reward successful application of mission command, they must also allow for failure in training to avoid developing excessively risk aversive subordinates.

(4) *Self-synchronized Forces.* This key idea flows from the notion of mission command. Training that emphasizes the commander's intent and independent action, initiative, and agility will help foster the idea of self-synchronization.

(a) The future Modular force will require training structured to include exercises that place multiple units in a dispersed area of operations and complex terrain, to create opportunities to practice self-synchronization, in order to facilitate rapid actions on contact, again without direction. This training can be likened to moving in formations under radio listening silence, in which individual elements maintain their relative positions without direction aided by unit tactical standard operating procedures and battle drills.

(b) The future Modular force will require training in the use of onboard simulations both statically and on the move in all environments, in order to conduct rapid adjustments to changing situations and to provide rehearsal opportunities prior to engagement.

(5) *Collaborative Planning, Accelerated MDMP.* In addition to the training capabilities mentioned for the key ideas above, other capabilities include-

(a) The future Modular force commanders will require both the means and the practice of collaborative planning and decisionmaking processes in the JOE, in order to provide rapid decisive decisions.

(b) Future Modular force commanders will require the opportunity to face challenging full spectrum tactical and operational problems with dynamic interaction, against a thinking adversary to achieve decision superiority.

(c) The future Modular force will require war games and exercises with realistic time constrained conditions in the JOE to challenge commanders and staffs, in order to execute effective C2.

(d) Future Modular force leaders will require progressive and reinforcement training on the systems that support collaborative planning and decisionmaking in full spectrum operations, so their utilization becomes second nature.

(e) Future Modular force commanders and their staffs will require red teaming as a means to rapidly test their plans in all environments and consider alternative approaches, based on anticipated adversary reaction.

(6) *Decision Superiority*. The Army must reprioritize content delivery methods that emphasize how to think. Being able to outthink an adaptive enemy with tremendous access to information is a weapon of great power.

(a) The future Modular force will require training and leadership development that emphasizes higher order cognitive processes in complex full spectrum operations, to enable rapid decisionmaking and effective C2.

(b) The future Modular force personnel system will require the capability to select battalion, brigade, and higher level commanders with demonstrated ability in the complex future JOE, in order to process complex information and issue timely instructions to their subordinates.

(7) *Single, integrated Army Battle Command System(s).* Joint capable to lower levels, future Modular force commanders and their staffs will require extensive training with whatever networking systems become available. This will further require-

(a) The capability to operate with degraded systems (mission command and self-synchronization).

(b) Adaptable leaders trained to deal with multi-national and interagency partners. This suggests a requirement for leaders schooled in domains other than just military. Selected leaders and staff should be trained either with government or industry to understand the diplomatic, information, military, and economic elements of national power. A fully-integrated battle command system must communicate with multi-national partners. Language and cultural training capabilities will only increase in the future.

5-5. Materiel Capabilities

a. Battle command, more than any other functional concept, is focused on the human dimension of warfare. Yet, the key ideas' emphasis on the centrality and expanded role of the commander highlight the extreme challenges commanders will face. Materiel solutions will ease this burden and speed up informed and improved decisionmaking include LandWarNet, one of several emerging technical concepts aimed at improving the function of command and control.

b. Figure 5-1 presents the definition and scope of LandWarNet. It is not strictly a materiel solution, but a systems approach that crosses the domains of DOTMLPF.

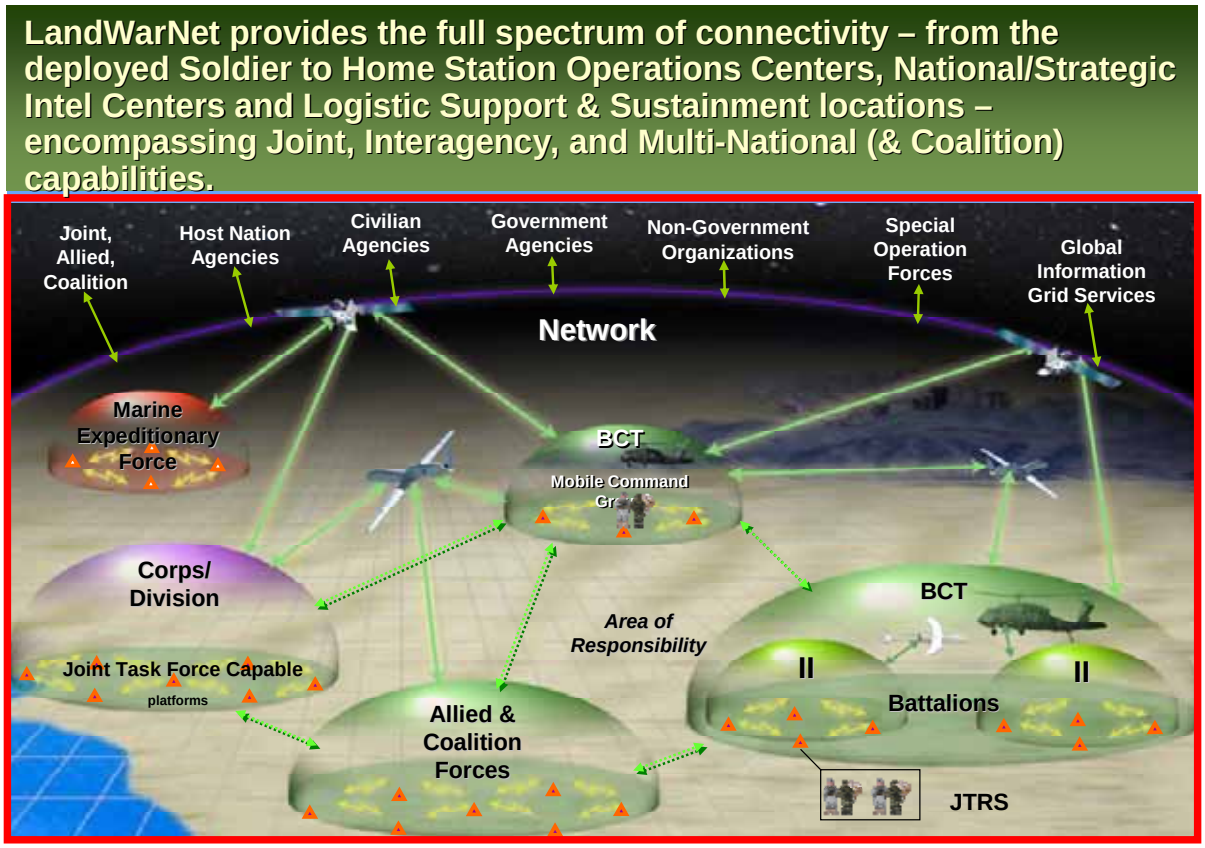

Figure 5-1. LandWarNet

c. The future Modular force command and control system will require the capability to-

(1) Establish a networked computing environment that provides the physical and logical connectivity among all the participants in the network. It must include data management strategies to ensure that data collected in one part of the network is compatible with the systems in use by the others in the network.[19]

(2) Develop solutions that will minimize or negate the consequences of an attack on the network.[20]

(3) Echelon command posts over greater distances while maintaining uninterrupted connectivity.

[19] Availability of data will be constrained by security considerations.
[20] From *Joint Command and Control Functional Concept, v1.0*, p.29.

(4) Develop C2 suites similar to today's command post of the future expanded and updated and tied into the future Blue Force Tracking system.

(5) Exercise BCOTM.

(6) Conduct en route planning and rehearsals with a system embedded on future combat systems including vehicles, aircraft, watercraft, and others, which allow direct, secure, real-time collaboration any place on the globe. This system must facilitate dynamic re-tasking of subordinate units as the situation changes.

(7) The ability to provide high altitude and space platforms, links, and processors to enable the sharing of information from a wide variety of sensors and sources. Commanders and their staffs will be able to access information simultaneously from multiple non-contiguous locations, in order to provide timely, actionable, and relevant information in support of the planning, execution, and assessment operations of the JF and component commanders.

(8) Provide a continuously updated COP from Soldier to the highest level of command with information gates that provide the necessary data pertinent to each level.

(9) Provide commander with real-time visibility of their units' combat readiness and locations to facilitate timely decisions.

(10) Provide logistics C2 with asset visibility that enables commanders to allocate resources at the point of main effort, maintain momentum, and retain the initiative.

(11) Automated systems that self-diagnose commodity consumption and system status, which in turn automatically initiates replenishment requests and related distribution actions.

(12) Future logistics information systems that are part of a joint federated information network, which is interoperable with major interagency, non-government, and multi-national organizations.

5-6. Leadership and Education Capabilities

a. One of the keys to the enabling of joint C2 will be the development of leaders and Soldiers who can perform effectively across the ROMO in a complex, uncertain, and dynamic operational environment. Fundamental principles of leadership are not likely to change, nor are the challenges future leaders will face likely to diminish. The ideas promulgated in this and other future Modular Force concepts do call for continuous development of leaders capable of extraordinary vision and influence in highly stressful situations. The primary impact of this increasing dimension of challenge is the clear need to "grow" competent leaders through education, training, experience, and self development.

b. Leadership development will need to focus on developing the enduring competencies of self-awareness and adaptability in order to enable future leaders to function effectively in a

collaborative decision environment rapidly. Future Modular force leadership development programs will require the capability to provide-

(1) Data, information, and knowledge management solutions to understand the risks, including information overload, and benefits of any particular architecture they engage in the course of an operation.

(2) The ability to co-evolve with all the other joint C2 enablers, so that leadership development keeps pace with the impact of the other enablers.

(3) The means to allow leaders to grow and develop trust experience. Attaining trust experience through extensive use of simulation, scenario-driven war games and experiments, and training exercises that challenge leaders will reduce the tendency to learn "on the job" in actual combat operations.

(4) Senior leaders who allow space, so subordinates can experiment within the bounds of intent based orders and plans, and who are willing to take calculated risks and accept the possibility that less experienced subordinates will make mistakes.

(5) Self learning through professional reading and professional military education.

(6) Emerging computer based war games and simulations molded to teach the art and science of war.

(7) Education and leadership development programs for Army officers for operational level command and staff.

(8) The junior leaders of the future Modular Force, such as young captains and junior non-commissioned officers, are approximately 10 years old today. As these pre-adolescents mature, they will adopt general characteristics that distinguish them from previous generations.[21] Future Modular force commanders must be aware of such generational differences when applying the Army's time honored leadership principles.

5-7. Personnel Capabilities

a. The nature of the command function is directly related to organizations and structures with command and staff positions identified at appropriate levels for specific skills and grades. This perennial effort of finding the right person for the right position only grows in importance as the command processes become more complicated, more demanding, and the pool of qualified candidates less full. Rather than developing an officer and NCO corps of generalists readily capable of jumping from one unit or function to another, it may be necessary to establish a full career cycle development plan for command tracked Soldiers. It may also become necessary to develop specialists in joint and multi-national operations.

[21] For examples of distinct generational differences, see Smith, J. Walker and Ann S. Clurman, *Rocking the Ages: The Yankelovich Report on Generational Marketing*, New York: Collins, 1998, and Shields, Patricia, "Changing Family Demographics and the Impact on Accession, Trainability, Motivation, Character, and Performance," Appendix K, *ROTC Future Lieutenant Study,* U.S. Army Cadet Command, 1999.

b. In light of these considerations and the *Battle Command* concept key ideas the future Modular force personnel system will require the capability to-

(1) Access highly motivated Soldiers and officers with appropriate educational and physical qualifications, define those qualifications in light of the challenges outlined in this functional concept.

(2) Recruit specialists with language and cultural skills, reliable backgrounds, and proven trainability for high skilled command and staff functions.

(3) Improve the officer and NCO career tracking system to provide appropriate progressive opportunities for developing command and staff experience.

(4) Stabilize leaders at all levels long enough for them to master their environment and the tasks peculiar to their organization.

(5) Improve the centralized selection process to promote and select for command individuals who have demonstrated ability to command at the next higher level. This is not a new capability, but one that always needs improvement.

(6) Provide special education opportunities for officers selected for command to develop higher level cognition skills as part of their pre-command preparation.

5-8. Facilities Capabilities

a. Unquestionably the nation's combat training centers have been the crucible in which commanders have perfected the art of command in a realistic environment. These centers include not only facilities, such as those located at Fort Irwin, California, at the National Training Center, but also the instrumentation and electronic systems that help evaluate units during maneuvers.

b. To build upon these successes and capitalize at the same time on technological developments, future Modular force facilities will require-

(1) Improved arrays and suites, such as the Nellis Air Force Base, Nevada, range that include sophisticated simulated threat systems in addition to monitoring arrays to better challenge leaders in a joint environment.

(2) Mobile and fixed computer assisted modeling and simulation facilities to provide commanders and staffs, from company to theater Army an ability to exercise C2 across the full ROMO.

(3) Maneuver sites capable of replicating the JOE from MCO to humanitarian assistance operations at all levels of command from company to theater Army with a focus on the BCT.

(4) A suite conveniently located to BCT home stations of ranges capable of

combining maneuver, fire, and aerial operations, both live and simulated, training exercises from company to full BCT under JOE conditions.

(5) Onboard simulation and C2 capabilities for appropriate ground tactical, and aerial, systems that will reduce the requirement for large fixed installations while permitting en route planning and rehearsal.

Chapter 6
Conclusion

a. Regardless of the environment and particular circumstances, battle command is the key element that translates information to decision superiority and remains the most critical function of joint operations. It will always remain a combination of art and science in which commanders at all levels utilize knowledge, experience, and intuition to execute operations that accomplish the mission. It is the integrating function between the functional concepts of *See*, *Move*, *Strike*, *Protect*, and *Sustain*.

b. Battle command draws from both art and science which correlate roughly to the human and the systems including the network and all its enablers. These distinctions are not clean cut lines, because the intellectual ability to absorb information and translate it into decisions can be enhanced by technology. The exercise of C2 of military operations is the centerpiece and integrator of all functional areas and mission capabilities.[22] C2 in the future will be both significantly different from today while many timeworn principles and leadership traits continue to apply. The primary differences will be in the speed and quality of decisions to outpace adversary C2 cycles. Technology will assist in this process by enhancing the speed of exchange of information through collaboration and a COP. This in turn will facilitate decentralization, and empower subordinates to exercise initiative. Regardless of the technological enablers, the leadership, agility, adaptability, and creativity of the human decisionmaker will remain central.

[22] Wallace, RUSI, Spring 2005, p. 22.

Appendix A
References

Section I
Required Publications

Capstone Concept for Joint Operations, Version 2.0.

Command and Control Joint Integrating Concept.

Functional Concept for Battlespace Awareness.

FM 1
The Army.

FM 3-0
Operations.

FM 5-0
Army Planning and Orders Production.

FM 5-0.1
The Operations Process.

FM 6-0
Mission Command: Command and Control of Army Forces.

Joint Command and Control Functional Concept.

JP 3-0
Joint Operations.

TRADOC Pam 525-3-0
The Army in Joint Operations, Version 2.0.

TRADOC Pam 525-3-1
The Army Operating Concept for Operating Maneuver 2015-2024.

TRADOC Pam 525-3-2
The Army Concept for Tactical Maneuver 2015-2024.

TRADOC Pam 525-2-1
The United States Army Functional Concept for See 2015-2024.

Section II
Relevant Publications

Army Magazine, Vol. 55, NO. 6, June 2005.

Joint Capabilities Integration and Development System, CJSCI 3170.01E.

Joint Forces Command Glossary. (Available athttp://www.jfcom.mil/about/glossary.htm)

Joint Operations Concepts Development System, CJSCI 3010.02B.
The National Defense Strategy of the United States, Secretary of Defense, March 2005.

Net-Centric Environment Joint Functional Concept.

Military Review, May-June 2005.

Overarching Operational Concept For Global/Joint Battle Management Command and Control (GJBMC2), Version 9M DRAFT.

RUSI Defence Systems, Spring 2005.

TRADOC Pam 525-3-4
The United States Army Functional Concept for Strike 2015-2024.

TRADOC Pam 525-3-5
The United States Army Functional Concept for Protect 2015-2024.

TRADOC Pam 525-3-6
The United States Army Functional Concept for Move 2015-2024.

TRADOC Pam 525-4-1
The United States Army Functional Concept for Sustain 2015-2024.

U.S. Army Transformation Roadmap.

Appendix B
Assumptions

The following assumptions underpin the *Battle Command* concept:

- The U.S. will maintain the capability to achieve landpower dominance, regime change, and to conduct sustained land control or stability operations in priority locations.
- Advances in information systems ISR capabilities will enable higher levels of SU in operations.
- Army force transformation campaign objectives will be achieved and will constitute a baseline with respect to basic force structure from 2015-2024.
- Army will remain a hybrid force of light, medium, heavy, and special purpose forces during the 2015-2024 timeframe. Modularization of combat, combat support, and combat service support units will be complete.
- Joint transformation will succeed in achieving its fundamental objectives, and joint command related concepts will evolve with the Army *Battle Command* concept.

Glossary

Section I
Abbreciations

BCOTM	battle command on the move
BCT	brigade combat team
C2	command and control
CCIR	commander's critical information requirements
CCJO	Capstone Concept for Joint Operations
CIE	collaborative information environnent
CJTF	coalition joint task force
COP	common operational picture
DA	Department of Army
DOD	Department of Defense
DOTMLPF	doctrine, organization, training, materiel, leadership and education, personnel, and facilities
GIG	global information grid
ISR	intelligence surveillance and reconnaissance
JF	joint force
JFEO	joint forcible entry operations
JFLCC	joint forces land component command
JIM	joint, interagency, and multi-national
JOA	joint operational area
JOE	joint operational environment
JTF	joint task force
MCO	major combat operations
MDMP	military decision making process
METT-TC	mission, enemy, terrain and weather, troops available, time available, and civil considerations
NGO	non-governmental organizations
OMSD	operational maneuver from strategic distances
ROMO	range of military operations
SA	situational awareness
SU	situational understanding
TRADOC	Training and Doctrine Command
U.S.	United States
WMD	weapons of mass destruction

Section II
Terms

agility
The ability to move quickly and easily. Agility, as it applies to joint C2, has six key elements: robustness, resilience, adaptability, responsiveness, flexibility, and innovation.

battle command
Battle command is the art and science of visualizing, describing, directing, and leading forces in operations against a hostile, thinking, and adaptive enemy. Battle command applies leadership to translate decision into actions, by synchronizing forces and warfighting functions in time, space, and purpose, to accomplish missions. (Derived from FM 3-0 (DRAG).

cohesive teams
Teams, including interagency and multi-national participants, who train and exercise together regularly become cohesive through joint training, the use of common tactics, techniques, and procedures, habitual working relationships, shared goals, and standing organizations (both virtual and physical). It should be noted that collocation is not necessary in order to form cohesive teams. Teams can be composed of humans, as well, as automated intelligent systems which will require fostering appropriate levels of trust in automation.

collaborative information environment (CIE)
The collaborative information environment is a specified information environment that enables collaborative processes at will between a select group of individuals or organizations. The CIE is a subset of the emerging global information environment. The CIE consists of five elements: Infrastructure (the hardware, software, communication links, and appropriate supporting equipment); People (members conducting activities to gain understanding in the environment); Architecture (the virtual connectivity structure designed to deliver, process, and function); rules (the customs, laws, procedures and policies that govern behavior in the collaborative environment); and information (the data representing potential knowledge in the environment). See Joint Command and Control Functional Concept, v1.0.

command and control (C2)
The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. C2 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.

common operational picture (COP)
See AR 25-52, FM 1-2, FMI 5-0.1, and JP 1-2 for discussion.

data
Information without context. Raw data is a signal that has not been processed, correlated, integrated, evaluated, or interpreted in any way.

decentralized execution
A decision in which a commander provides his subordinates the opportunity to take the initiative during the execution of a mission, due to the fragility of plans in the face of the harsh and dynamic operating environment of combat, so long as the subordinate's decision supports meeting the commander's intent.

decentralized support
Support services and command that are geographically dispersed. Decentralized support will assist the decisionmaking process by allowing access to teams of experts and analysts who are not co-located with the commander. The ability to reach back to a more secure area allows the forces to deploy with a smaller footprint.

de-confliction
Preventing elements of the JF from operating at cross-purposes.

flexibility
The ability to achieve success in different ways.

flexible synchronization
Discretion to execute a range of control mechanisms, including self-synchronization, to achieve the commander's intent.

framing
The identification of existing conditions (context) by interrelating elements and/or systems to form an integrated whole having a unifying or coherent structure. This assumes that the existing set of conditions, the problem, is less than satisfactory (incomplete, changed, or unclear) and that a new set of conditions, a solution, would be desirable. At the operational and strategic levels, the commander frames the existing conditions by interrelating political, military, economic, social, informational, and infrastructural elements from the perspective of friendly forces, the adversary's perspective, and the perspective of relevant third parties. At the tactical level commanders inter-relate the factors of METT-TC with respect to friendly forces, enemy forces, and terrain. By relating the elements to form an integrated whole, the commander achieves a level of understanding of the existing conditions which is a necessary precursor to visualizing, describing, directing, leading, and assessing.

full spectrum operations
Military actions that can extend across the entire ROMO from MCO to stability operations. ROMO and full spectrum operations can be considered synonyms. They can also be described in terms of offensive, defensive, stability, and civil support operations.

functional concept
The amplification of a particular function, such as counter-air or description of how to employ a system or conduct a task, such as time-sensitive targeting. Functional concepts rely on integrating concepts for their operational context. A functional concept may be specific to a particular integrating concept or it may apply more broadly to multiple integrating concepts. Individual functional concepts provide the detail required for specific experiments. As with integrating concepts, candidate functional concepts should describe their relationship

to the desired operational capabilities of the future and establish a benchmark against which to measure improvement.

The global information grid (GIG)
The globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to warfighters, policymakers, and support personnel.

information
Facts, data, or instructions in any medium or form with context that is comprehensible to the user.

information superiority
The degree of superiority in the information domain that permits the conduct of operations without effective opposition.

integrating concept
Description of how a JF commander integrates functional concepts and capabilities within a broad operational mission. Integrating concepts typically focus on forces and functions rather than on specific systems, as well as, amplify a key area of the CCJO to provide a more detailed operational level perspective for joint experimentation and assessment activities. A number of integrating concepts will likely be required to adequately amplify the capstone concept across the full ROMO. Candidate integrating concepts should describe their relationship to the desired operational capabilities of the future and establish a benchmark against which to measure improvement.

knowledge
Data that has been analyzed to provide meaning and value. Knowledge is various pieces of the processed data that have been integrated and interpreted to begin building a picture of the situation.

leadership
Leadership is influencing people, by providing purpose, direction, and motivation, while operating to accomplish the mission and improve the organization.

maneuver support
Those capabilities which enable the maneuver commander's freedom of action and protect the force. Maneuver support provides a wide range of integrated actions, both proactive and defensive, to support uninterrupted momentum, allowing maneuver forces to preserve combat power so that it may be best applied at decisive points and times, to foster rapid transitions in operations. (MANSCEN).

military decision making process (MDMP)
A deliberate methodical process of analysis, course of action consideration and selection, and translation of commander’s intent into plans and orders.

multi-national organizations
A collective heading for intergovernmental and international organizations.

network-centric operations
An information superiority-enabled concept of operations that generates increased combat power by networking sensors, decisionmakers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization. In essence, it translates information superiority into combat power by effectively linking knowledgeable entities in the operating environment.[23]

non-governmental organizations
Transnational organizations of private citizens that maintain a consultative status with the Economic and Social Council of the United Nations. Non-governmental organizations may be professional associations, foundations, multi-national businesses, or simply groups with a common interest in humanitarian assistance activities (development and relief). "Non-governmental organizations" is a term normally used by non-U.S. organizations. Also called NGOs.

observe, orient, decide, act
Described as a “loop” or cycle relating to the aerial dog-fighting technique of turning inside the opponent aircraft to gain a firing advantage. Also used as “turning inside the opponent’s decision cycle.”

precision engagement
The ability of JFs 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 ROMO (Joint Vision).

processed data
See “Information.”

range of military operations (ROMO)
See full spectrum operations.

red teaming
Red Teaming is a function executed by trained, educated, and practiced team members that provides commanders an independent capability to fully explore alternatives in plans, operations, concepts, organizations, and capabilities in the context of the operational environment and from the perspectives of partners, adversaries, and others. (Derived from University of Foreign Military and Cultural Studies, Fort Leavenworth, KS).

responsiveness
The ability to plan, execute, and assess effectively. Many military actions must be taken within a window of opportunity that will vary in each situation.

[23]Alberts, Garstka and Stein. *Network Centric Warfare: Developing and Leveraging Information Superiority*. 2nd Edition (Revised), 1999.

responsive and tailorable organizations
Proficient, cohesive, task-organized, and networked teams using common procedures, and relevant information capable of responding rapidly to plan and execute a broad ROMO.

robustness
The ability to perform effectively across a range of conditions, circumstances, and missions.

self-synchronized operations
The collaborative and decentralized initiation and execution of actions by elements of a JF in support of the desired end state. Also defined as the interaction between two or more entities to operate in the absence of hierarchical mechanisms for joint C2. A mechanism for communicating the ongoing dynamics of the operational situation and triggering the desired value-added interaction. Self-synchronization is an extension of mission command in which commanders, understanding the intentions of the higher commander, conduct operations independently, sometimes without collaboration, that are inherently synchronized with other commanders operating within the same intent.

simultaneous C2 processes
Capability for parallel C2 processes for monitoring and understanding the operational environment and synchronizing actions of assigned forces.

situational awareness (SA)
Knowledge and understanding of the current situation which promotes timely, relevant, and accurate assessment of friendly, enemy, and other operations within the battlespace in order to facilitate decisionmaking. An informational perspective and skill that foster an ability to determine quickly the context and relevance of unfolding events. (Marine Corps, FM 3-0). Situational awareness is knowledge of the immediate present environment, including knowledge of the factors of METT-TC. More simply, it is knowing what is happening around you now. In the context of the cognitive hierarchy, situational awareness is at the knowledge level. (FM 5-0.1).

situational understanding (SU)
The product of applying analysis and judgment to relevant information to determine the relationships of the factors of METT-TC to facilitate decisionmaking. (FM 3-0 (DRAG)). (Marine Corps). Knowledge and understanding of the current situation which promotes timely, relevant, and accurate assessment of friendly, enemy, and other operations within the battlespace in order to facilitate decisionmaking. An informational perspective and skill that foster an ability to determine quickly the context and relevance of unfolding events. (FM 1-02).

superior decisionmaking
Leadership and supporting capability to generate alternative actions, identify selection criteria, and assess alternatives to control operational situations. Includes the use of automation in exchange, fusion, and understanding of information relevant to rapid collaboration, knowledge-based decisionmaking. Implies the ability to perform effective decisionmaking in a timely fashion.

synchronization
The arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time and in the intelligence context, application of intelligence sources and methods in concert with the operation plan. (JP 1-02 and JP 2-0).

uncertainty
Lack of sureness about someone or something. A fundamental attribute of war. Uncertainty pervades the battlefield in the form of unknowns about the enemy, the surroundings, and our own forces.

understanding
Knowledge that has been synthesized and had judgments applied to it in the context of a specific situation. Understanding reveals the relationships among the critical factors in any situation.

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