

USAWC STRATEGY RESEARCH PROJECT

TRANSFORMING SIGNAL SUPPORT TO THE THEATER

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ABSTRACT

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The United States Army is transforming to meet the national security challenges of the 21st century and to remain relevant and ready. The new force structure will feature a CONUS-based force projection Army, which is more modular, more lethal, and more deployable.

A key enabler of the modular Army is the network. The ability of our forces to not only operate in a net-centric environment, but to exploit it to our advantage, is a fundamental concept surrounding Army Transformation. Based on this underlying idea of ubiquitous network access and steadfast network reliability, management of the Army's networks at all levels takes on an increasingly important role. It is essential that the Army examine this dimension of Transformation, and transform network management to best support the Army and Joint Force Commanders. What capabilities are required? How should signal forces at the theater level be organized to best support a modular force? This paper will examine some of the implications of Army Transformation on network management, and specifically look at the role of the Signal Command (Theater) in providing seamless support to a force projection Army.

TRANSFORMING SIGNAL SUPPORT TO THE THEATER

The United States Army is transforming. Transformation deals with: changes in the way military forces are organized, trained, and equipped; changes in doctrine, tactics, techniques, and procedures that determine how they are employed; changes in the way they are led; and, changes in the way they interact with one another to produce effects in battles and campaigns.¹ Another way of looking at Transformation is to look at the three components of our Army's transformation strategy: transformed culture, transformed processes, and transformed capabilities.² The cornerstone of the Army's capabilities is to come from its conversion to modular forces, which transforms its capabilities, its processes, and to be successful, its culture. This paper will focus primarily on capabilities required, specifically network operations capabilities, and describe how the best way to achieve these capabilities is through the Signal Command (Theater).

Background of Army Transformation

With the demise of the Soviet Union, a fundamental change occurred in what the United States needed and expected from its military forces. The overriding priorities during the Cold War had been clear capabilities to (1) deter a nuclear attack against the United States and its allies; (2) deter war between superpower coalitions; and (3) if deterrence failed, ensure marginal superiority over Cold War opponents sufficient to resolve a conflict on terms favorable to the United States and its allies.³ All other demands that might be placed on our military forces were regarded as lesser-included capabilities in the forces needed for these three overriding priorities.⁴

With the end of the Cold War, the demand quickly evolved to forces able to dominate opponents across the full range of military operations, from strategic nuclear deterrence to humanitarian relief, with the expectation they could do so with little or no loss of life in our forces and minimum unintended damage.⁵ This dramatic change in the demands placed upon our forces leads logically to a need for dramatic changes in their capabilities – a transformation.⁶

The changes required for the Army to remain “relevant and ready” as its slogan states, will not be achieved all at once, or be completed by a certain date. Transformation is a process. In fact, the Department of Defense Office of Force Transformation defines it as “a process that shapes the changing nature of military competition. . . . First and foremost, transformation is a continuing process. It does not have an end state.”⁷

The objective of the Department of Defense in the transformation process is to realize military capabilities that can deal effectively with the new demands of a changing security

environment. Transformation involves preserving current U.S. strengths, meeting new threats and environments, and exploiting new opportunities.⁸ In October 1999, then Chief of Staff of the Army General Eric Shinseki introduced the Army's transformation strategy in which he intended to convert all of the Army's divisions (called Legacy Forces) into new organizations called the Objective Force. General Shinseki's goal was to make the Army lighter, more modular, and – most importantly – more deployable. His goals were to deploy a brigade in four days, a division in five days, and five divisions in 30 days.⁹

The events of September 11, 2001, coupled with a global resurgence of terrorism and wars in Afghanistan and Iraq, have ushered in another period of significant change to the security landscape.¹⁰ This has set in motion an effort by the Army's senior leaders, as well as the Joint Chiefs of Staff, to effect change at an accelerated rate.¹¹

Characteristics of the Operating Environment

In the 2004 Army Transformation Roadmap, Chief of Staff of the Army, General Peter J. Schoomaker states, "America is a nation at war. Peace can no longer be viewed as the default condition nor war as the exception."¹² Ongoing operations in Iraq, Afghanistan, and elsewhere around the world certainly seem to support this assertion. The roadmap further defines this new strategic reality as: a conflict of irreconcilable ideas; a disparate pool of potential combatants; adaptive adversaries seeking our destruction by any means possible; evolving asymmetric threats that will relentlessly seek shelter in those environments and methods for which the nation is least prepared; and, a foreseeable future of extended conflict in which the Army can expect to fight every day and in which real peace will be the anomaly.¹³

The challenge for the Army is to fight and win these conflicts, while simultaneously transforming itself into a more effective fighting force. The challenge above all is one of mindset, because decades of planning and preparation against set-piece enemies predisposed American Soldiers to seek certainty and synchronization in the application of force.¹⁴ The world has changed dramatically in recent decades. Therefore, the Army must adapt – not only to accept the need for sweeping changes, but to accept the pace of change as well. General Richard B. Myers, Chairman of the Joint Chiefs of Staff maintains, "Today, the threat is unprecedented, and we must not only respond to the rapidly changing security environment, but we must do so at an accelerated rate."¹⁵ Just as speed is important on the battlefield, the pace of innovation must increase.¹⁶

One reason for increased pace of change is the shift from the Industrial Age to the Information Age. The Information Age is: changing how wealth is created; altering the

distribution of power; increasing the complexity; shrinking distances around the world; and, compressing time, which increases the tempo of our lives.¹⁷ These changes in the dimensions of time and space are increasing the pace of events, or operating tempo, in many different environments. This phenomenon is seen in the rapid fluctuations of the stock market around the world, in the shortening half-life of a breaking news story, in the shrinking time it takes for a product to reach the market, and in the waning attention span of the public. Responsiveness and agility are fast becoming the critical attributes for organizations hoping to survive and prosper in the Information Age.¹⁸ The Information Age, by making it possible to collect and disseminate images widely, is seemingly bringing us a modern-day version of the Circus Maximus 24 hours a day, 7 days a week. To know is to get involved, and in a democracy, involvement means public debate. Learning to live with friends and foes alike looking over one's shoulder in real time will be a formidable challenge and can be expected to affect how we approach potential and real threats to national security.¹⁹

So, the requirement for the Army to change, and to do so rapidly is being driven by the global environment in which we live. Information travels literally at the speed of light, economies are linked in complicated ways, and cultures are continually blending. This global environment is also one of uncertainty, volatility, rapidly evolving technology, and a desire for instantaneous information. It seems logical that as the world changes, dramatic changes are also required to a military machine which is historically slow to change. The demands of our global environment have led to a requirement for a new kind of Army – a modular Army. Describing the direction the Army needed to take, then Chairman of the Joint Chiefs of Staff, General Richard B. Myers stated that “the new force structure would feature a CONUS-based force projection Army, which was more modular, more lethal, and more deployable.”²⁰

Because the United States can no longer afford to keep large numbers of military forces forward-stationed around the world, the need for a rapidly deployable force is essential. In this new environment we live in, it is clear that our Soldiers will operate under conditions where uncertainty and ambiguity are the rule.²¹ The norm will be short-notice operations, extremely austere theaters of operations, and incomplete information.²² Based on these rules, an expeditionary force is critical. However, just getting to the fight will not be enough. In order to successfully fight and win during sustained operations, we will also need to be a campaign-quality Army. In addition, the Army must further develop a joint culture. To meet the challenges of expeditionary operations, the Army can and must embrace the capabilities of its sister services at all levels, from the land component commander down to the individual soldier.²³ Joint interdependence is key, and goes beyond joint interoperability. In fact, Debra Filippi,

Senior Program Manager Executive, Net-Centric Enterprise Services (NCES), DISA states that “interoperability will no longer be enough – eradicate it from vocabulary.”²⁴ Joint interdependence purposefully combines Service capabilities to maximize their total, complementary and reinforcing effects, while minimizing their relative vulnerabilities.²⁵ Combining the capabilities of all Services in each dimension – land, sea, air, and space – is necessary to generate a synergy that creates overwhelming dilemmas for opponents.²⁶

The objective, therefore, of today’s Army is to transform to a campaign-quality force with joint and expeditionary capabilities to provide relevant and ready landpower to combatant commanders and the Joint Force.²⁷ These qualities will be necessary for our Army to fight and win in an operating environment consisting of short notice operations, austere theaters of operations, the requirement to fight upon arrival, and the reality of a CONUS-based force generation pool.²⁸

Network Operational Imperatives

The evolution of the Army to modular combat forces requires the same extensive examination of combat support and combat service support forces and capabilities. In fact, while specifically discussing the capabilities of space and cyberspace in particular, the Beyond Goldwater-Nichols Phase II report states, “It is necessary to transition fully from treating these domains as support functions to treating them as essential elements in the joint war fight.”²⁹ Regardless of whether you consider the network as a support function or an essential combat element, even critics of transformation would agree that the network will play an increasingly vital role. Combat power will be generated from the effective linking or networking of the warfighting enterprise.³⁰ This realization has led to the concept of Network Centric Warfare (NCW). Network Centric Warfare is about human and organizational behavior. . . . It is characterized by the ability of geographically dispersed forces to create a high level of shared battlespace awareness that can be exploited to achieve the commander’s intent.³¹ It will involve ways of operating that have yet to be conceived, and will employ technologies yet to be invented.³²

To achieve effective network centric operations, one area where dramatic changes are required is in the Army’s communications networks -- from technologies to procedures to organizational structure of the signal forces operating them.

Some examples of signal force structure changes are: the deactivation of division signal battalions; increased responsibilities for the G6 staff officer; organic signal support at the BCT level; and the creation of a theater network operations capability. While there is still concern

among some Army leaders about whether currently proposed changes to signal structure will be appropriate, this paper specifically examines the capabilities of a Signal Command (Theater), (SIG CMD) and its contribution to the joint force commander. In order to effectively analyze what the SIG CMD brings to the fight, we must examine the network operational imperatives driving the need to change. Colonel Brian J. Donahue, Chief of Army Transformation asserts that the operational imperatives of short notice operations, austere operating environments, the requirement to fight upon arrival, and a CONUS-based force will all have impacts network operations, to include theater network support.³³

First, short notice operations have always been somewhat of a way of life for the United States Army, especially with certain rapid reaction forces. However, the Information Age in which we now live has served to increase the need for rapidly deployable, agile forces. In fact, the author of many writings on transformation and network centric operations, David S. Alberts states, "Agility will prove to be the most important single characteristic of military forces in the 21st century." He goes on to say, "The road to agility is paved with information."³⁴ So what do short notice operations and agility imply for network operations? Colonel Donahue maintains that forward-stationed combat units and theater enablers (such as network support) must be capable of immediately executing the transition to war, conducting the first ten days of war without augmentation, and the first 30 days with minimal augmentation.³⁵ These requirements are driven by operational planning factors of 72 hours or less of unambiguous warning, and the unpredictable and time-sensitive responses required for non-combat operations such as Hurricane Katrina or tsunami relief operations.³⁶ Examining the nature of the Information Age and the implications to military operations, Alberts states, "It is ironic that the Information Age, which on one hand gives us vastly increased capabilities to collect and process data that make it possible to make better and better decisions more and more quickly, is—with the other hand—reducing the time available to make decisions."³⁷ Given these factors, it becomes clear that to successfully execute short notice operations with speed and agility, a network operations capability must be forward stationed in the theater of operations. This capability is found in the Signal Command (Theater).

The second operational imperative of fighting upon arrival also generates several network imperatives. To begin with, the ability to fight upon arrival in a combat zone will generate the need for ubiquitous network access throughout the strategic movement phase. This requirement for network access would literally start back in garrison, remain throughout the training, mobilization, and deployment phases of the operation, and continue while en route. Then, there is a requirement for immediate network availability upon arrival in the Joint

Operating Area.³⁸ No longer will forces have the luxury of deploying into an operation and spending weeks and months organizing, training, and preparing to go into combat. The expectation for an expeditionary force is to fight upon arrival, and to do this, networking capability will be required. Finally, the requirement to fight upon arrival generates the need for modular command, control, communications, and computers (C4) interoperability.³⁹ General Myers stresses, "Interoperability is a necessary prerequisite to integrated and interdependent joint operations. . . . The interoperable joint force can act in an integrated and ultimately an interdependent way among joint force components and capabilities, facilitating more effective interoperability with interagency and multinational partners."⁴⁰ Therefore, to interoperate with coalition and interagency partners, and certainly to effectively exploit the capabilities of network centric warfare, C4 interoperability is essential to our ability to fight upon arrival. The Theater Network Command will ensure these requirements are met.

The third operational imperative driving network operations is that of austere operating environments. If we look at military operations over the past decade or so, it immediately becomes clear that we must be prepared to operate in extremely austere environments, where basic services may not even be present. Consider Somalia, Rwanda, Iraq, Afghanistan, and remote areas of Thailand and Indonesia where tsunami support was provided. These areas afforded varying levels of infrastructure availability to friendly forces. As the United States Army takes on more missions of humanitarian assistance in remote corners of the world, this imperative is emphasized. DoD's Capstone Concept for Joint Operations document tells us, "The joint force may also be required to provide security, initial humanitarian assistance, limited governance, restoration of essential public services, and similar types of assistance typically required in reconstruction efforts."⁴¹ In addition, the Army's growing mission of military support to civil authorities in situations like Hurricane Katrina could cause us to see somewhat austere environments even on American soil. These scenarios generate a critical dependence of our military forces on network connectivity.⁴² More importantly, the imperative of austere environments generates the requirement for the network to be able to project forward from the operational base to provide the capability to project command and control (C2) presence and combat enablers forward to deployed formations.⁴³ As stated in the DoD capstone document, "The joint force will capitalize on being networked by making user-defined information and expertise available anywhere within the network, and will exploit network connectivity among dispersed joint force elements to improve information sharing, collaboration, coordinated maneuver, and integrated situational awareness."⁴⁴ Army forces will require network connectivity, and that connectivity will more than likely need to be projected forward from the

“home station” or operational base to support deployed forces in an austere environment. The Signal Command (Theater) is the organization responsible for operating and maintaining the Army’s portion of the theater network, and responsible for projecting this capability forward to deployed forces.

The final operational imperative to consider is that of a CONUS force generation pool. One of the stated objectives of the Army Campaign Plan is to “adjust the global footprint.” The Army Transformation Roadmap tell us that the goal is to “adjust Army stationing and support infrastructure in accordance with integrated global presence and basing strategy to better execute the national defense strategy and support operational deployments and sustained operational rotations.”⁴⁵ One of the outcomes of this is an overall reduced footprint at overseas locations and increased CONUS-based forces. The most important network operational imperative this generates is the need for the theater network to be fully integrated into the Army Enterprise network, also referred to as LandWarNet. Integration at the theater level will enable effective command and control across all phases of operations as geographically dispersed units train, mobilize, deploy and fight. Another reason for network integration at this level is that it will enable the smooth integration of CONUS forces into the theater network extended into the Joint Operating Area (JOA).⁴⁶ The Signal Command (Theater) is the organization best suited to integrate the theater’s network into the Army LandWarNet.

Modular Forces

“As we prepare for the future, we must think differently and develop the kinds of forces and capabilities that can adapt quickly to new challenges and unexpected circumstances. We must transform not only the capabilities at our disposal, but also the way we think, the way we train, the way we exercise and the way we fight.”

--Secretary of Defense Donald H. Rumsfeld⁴⁷

Along with the other services, the Army has embarked on a process of transformation. The Army’s answer to maintaining relevance in this new operating environment is to transform into “plug-and-play” modular force. At the center of the modular force is the Brigade Combat Team (BCT), a significant change from the division-centric Army of the past. Enabling this force will require many new systems, tactics, techniques, and procedures. There are also clearly numerous network operational imperatives brought about by the operating environment in which we find ourselves. So, how is the Army structuring its signal forces to organize for success in this environment?

As part of the Army's Transformation process, division and corps signal battalions and brigades will be deactivated and their component elements reassigned directly to combat forces. Integrating this organic communications capability into BCTs is expected to enable network centric operations. The fully fielded BCT will also be equipped with Future Combat System (FCS), the Army's multi-billion dollar program consisting of 18 manned and unmanned systems which is at the heart of the Army's transformation efforts.⁴⁸ It will enable improved intelligence, surveillance and reconnaissance (ISR), enhanced analytical tools, joint exchange of blue and red force tracking down to the tactical level, battle command, real-time sensor-shooter linkages, and increased synergy between echelons and within units.⁴⁹ Some systems within FCS have already been developed, but many are still being developed and several have already proven to be problematic, such as the Joint Tactical Radio System (JTRS).

It is evident, that even with perfectly performing systems, the BCT Commander has inherited a tremendous responsibility to maintain the network for his brigade forces. It also becomes readily apparent that the division G6 (communications) staff officer will have an enormous job orchestrating the sheer numbers of systems and complexity of communications requirements for the division. In fact, in recognition of these increased responsibilities, the Army has begun choosing division G6 staff officers by means of a central selection board, just as battalion and brigade commanders have been selected for years. Just as a brigade S6 job is now considered a branch-qualifying position for a major, a division G6 job will be likewise for a lieutenant colonel. Being selected as a division or corps G6 will be considered a significant career achievement, and these will certainly be among the most challenging jobs available for a signal officer.

Another change in the signal structure is the conversion of theater signal battalions to Integrated Tactical Signal Battalions (ITSB). The most current Army Field Manual covering Signal Support to Theater Operations, FM 6-02.45 states that the centerpiece of the current force transformation of theater tactical signal units is the ITSB. The ITSB is organized into multifunctional elements, each containing all of the switching equipment, the transmission systems, the data network management systems, and the C2 and data network management resources that comprise a complete signal node. This is a fundamental shift from battalions containing single function companies (for example, SATCOM or TROPO companies) such as the composite signal battalions that are among the structures being replaced.⁵⁰ Typically these ITSBs will be assigned to theater signal brigades, although they may be assigned or attached to other higher-level organizations as well. The ITSB supports the doctrinal objectives of enabling reach-back support and enabling a similar level of electronic information services as the unit

would receive in a garrison environment.⁵¹ The mission of the ITSB is to provide the capability to engineer, install, operate and maintain up to three major and 12 extension multifunctional C4 technology nodes in support of the combatant commanders of unified or specified commands, as well as Army Service Component Command (ASCC), Joint Task Force (JTF), or Joint Force Land Component Commander (JFLCC) commanders.⁵² Specifically, the ITSBs will support units such as certain Support Brigades, as well as Major Subordinate Commands (MSC) and Functional Brigades at the Corps level which require pooled C4 support.⁵³

So who will provide support to the ITSB's? Clearly, a network operations (NETOPS) capability is required at the theater level to enable the integration of signal support throughout the theater. This capability can best be provided by a Signal Command (Theater) or like capability assigned or attached to the ASCC commander. Currently, an ASCC commander like the United States Army Pacific (USARPAC) Commander in Hawaii, for example, has a Theater Signal Command (TSC) whose mission it is to mobilize in the event of a Major Contingency Operation (MCO). The TSC supporting USARPAC, the 311th Theater Signal Command, is based at Fort Meade, Maryland and consists of over 75% reserve component personnel. When converted to a Signal Command (Theater), the organization will be forward-stationed in Hawaii, and will need to have over 75% of its personnel on full-time active duty in order to execute network support for deployments with little or no augmentation for the first 30 days.⁵⁴ In the USARPAC example, the ITSBs will be assigned to either the 516th Theater Signal Brigade in Hawaii, or the 1st Signal Brigade in Korea, both of which will be assigned to the 311th TNC. In Europe, however, the theater network integration will be provided by a Signal Command (Theater) module attached to the 2nd Theater Signal Brigade. Regardless of the title of the organization, similar functions need to be provided.

Role of the SIG CMD

One of the primary functions of the SIG CMD is to enable the CONUS-based modular Army with expeditionary capabilities to be responsive to the combatant commander. In order to do this, the SIG CMD has a critical 7x24x365 mission to manage the theater's portion of the LandWarNet – the Army's Enterprise network – and deliver this capability across all phases of expeditionary operations. Along with access to the Army's network in theater, the SIG CMD must also ensure full and continuous integration into the combatant commander's joint network – the Theater Information Grid.⁵⁵ This will allow the theater network to support all day-to-day operations and immediately transition to extend the network to enable forward stationed and

CONUS-based modular formations to simultaneously deploy from multiple different power projection platforms and fight upon arrival in a JOA.⁵⁶

The network management function includes managing systems and applications, servers, personal computers, laptops and handheld computers, and performing configuration management, fault management, accounting, performance management and security management. In addition, it includes transmission systems management for systems such as SATCOM (satellites), microwave radio, fiber optics and copper cabling, along with frequency management to include the acquisition, allocation, protection and utilization of radio frequencies and callsigns. In addition to these functions, the SIG CMD provides access to the Army Enterprise Infrastructure, providing core services such as email, web access, file and print services, directories, and Public Key Infrastructure (PKI) and Common Access Cards (CAC).⁵⁷

One of the most important functions provided by the SIG CMD is Information Assurance (IA) in the form of Computer Network Defense (CND).

“The threat of terrorist attacks against US citizens and US interests around the world has become the nation’s most pressing national security issue. . . . This aggression will likely take a variety of forms and may include cyber attacks by terrorist groups themselves or by targeted nation-states. Even more likely are cyber attacks by sympathizers of the terrorists, hackers with general anti-US or anti-allied sentiments, and thrill seekers lacking any particular political motivation.”⁵⁸

FM 6-02.45

These words of wisdom from the Army’s Field Manual on Signal Support to Theater Operations are unmistakable -- security of Army networks is vital. This is especially pertinent if you consider the words of Secretary of Defense Donald Rumsfeld when he stated, “Our ability to leverage the power of information and networks will be key to our success in the 21st Century.”⁵⁹ We cannot leverage this power if our networks are not aggressively protected. The basis of the SIG CMD’s ability to defend the theater network is the Theater Network Operations and Security Center (TNOSC) assigned to the TNC. This 24x7 operations center is collocated with the Regional Computer Emergency Response Team (RCERT), an organization which specializes in network security. These organizations work in concert to ensure the SIG CMD commander has situational awareness of the network, while proactively managing all aspects of NETOPS, including information assurance. In general, information assurance capabilities at the tactical level are not as well developed as they are at the theater level. Therefore, the function of network defense becomes extremely critical at the theater level, where numerous modular formations will connect to the theater network.

Another significant function of the SIG CMD is to integrate and synchronize what has traditionally been known as the strategic echelon and multiple echelons of tactical networks into a single integrated and seamless theater network environment. Employment of a CONUS-based Army with joint and expeditionary capabilities cannot permit seams created by an echelon approach to the network. The network must be fought from an integrated perspective to achieve seamless C2 and Network Operations from the home stations of deploying formations, through power projection platforms, throughout the strategic deployment, to the operation base, and into the AO of this single integrated network. The SIG CMD is the logical element to perform this function for the theater.⁶⁰

The integration and synchronization of the network is further enabled by the “dual hatting” of the SIG CMD Commander as the G6 for the ASCC. The G6 has direct access to the ASCC commander and staff, and an enduring functional relationship with the combatant commander’s J6 staff, as well as subordinate G6s. Since the SIG CMDs are actually assigned to Network Enterprise Technology Command (NETCOM) and OPCON to the ASCC, the SIG CMD commander will have a command relationship with NETCOM, facilitating integration of the network into the Army Enterprise. The SIG CMD commander will also have command authority over subordinate theater signal brigades that provide network capability in both the operational base (strategic) and tactical environments.⁶¹

Last, the SIG CMD must play a traditional and transformational training role in achieving modular C4 interoperability to enable a modular Army with joint and expeditionary capabilities.⁶² In a traditional role, the TNC is responsible for training all assigned Signal formations that provide C4 support in both the operational base (strategic) and tactical environments. The SIG CMD provides tactical support to: Army Support to Other Services (ASOS); the ASCC Operational Command Post (OCP); other deployable command posts and subordinate formations; functional brigades; and assigned, attached, or OPCON battalions to Combat Support Brigades (Maneuver Enhancement), fires, battlefield surveillance, aviation and sustainment brigades forward stationed in the AOR.⁶³ In a transformational training role, the SIG CMD Commander will be responsible to “certify” that all signal elements organic to modular formations that are assigned, attached, OPCON or under Training Readiness Oversight (TRO) to the theater are trained and equipped under a common joint/Army standard to achieve modular C4 operational and technical interoperability.⁶⁴ Colonel Donahue states that for signal forces to move from a “ready” pool to be considered “available” for deployment should be based on their ability to connect to the theater network – in other words, to be certified by the Signal Command (Theater).⁶⁵

Conclusion

Overall, the workload for theater signal support has increased. The technical scope of the theater's signal mission has expanded to include numerous new data services and significantly increased bandwidth.⁶⁶ Theater signal forces are frequently called upon to provide network services such as local area networks (LANs) and wide area networks (WANs) to coalition partners. . . . Because many joint and coalition partners may not have adequate quantities of compatible network equipment, or may not have computer network equipment at all, theater signal forces are frequently called upon to provide user equipment as well as services.⁶⁷ In addition, theater signal units are frequently called upon to accompany and support organizations outside traditional echelon affiliations. An example of this support is shown during Operation Iraqi Freedom, when theater signal units accompanied elements of the Third Infantry Division in the march into Baghdad in order to provide adequate SATCOM capability.⁶⁸ The result is that theater signal units render support on an anyone-, anytime-, and anywhere-basis. Theater signal units are among the earliest responders in the establishment of a theater of operations.⁶⁹ The Signal Command (Theater) provides critical capabilities required at the right place and time to ensure success.

Increased globalization is bringing changes to the international strategic landscape based on a rise of new powers, population shifts, competition for natural resources, impacts of governance, a pervasive sense of global insecurity, and evolving coalitions, alliances, partnerships, and new actors (both national and transnational) that will continually appear and disappear from the scene.⁷⁰ Therefore, the future operating environment for military forces is expected to be extremely dynamic.⁷¹

In order to maintain our position as a world leader, the United States must be able to adapt to this changing environment. One way to do this is by transforming our military into a smaller, faster, more lethal, more deployable joint force. In doing so, the Army has embarked on a transformation process which shifts the focus from division-centric to brigade-centric, with Brigade Combat Teams as the basic building block. Cementing it all together is "the network."

Network operations are continuing to receive increased attention across the Army. The importance of the network as a critical enabler of network centric operations is readily apparent. In fact, the Network Centric Warfare Report to Congress states, "In the future, the network will be the single most important contributor to combat power."⁷² It stands to reason that the operational imperatives brought about by the strategic landscape will have significant effects on network operations throughout a theater operations area. As an Army, we must realize what these operational imperatives mean to the theater environment, and adapt our signal forces in

theater to effectively support the Combatant Commander. The Signal Command (Theater) provides the combatant commander with unique capabilities to integrate and synchronize signal support into a seamless theater network.

Endnotes

¹ Transformation Study Group, *Transformation Study Report, Executive Summary: Transforming Military Operational Capabilities*, Prepared for the Secretary of Defense (Washington, D.C.: Transformation Study Group, April 27, 2001): 3.

² General Peter J. Schoomaker and R.L. Brownlee, *United States Army 2004 Transformation Roadmap*, Prepared by Office of the Deputy Chief of Staff, U.S. Army Operations, Army Transformation Office, (Washington D.C.: Army Transformation Office, July 2004), 1-3.

³ Transformation Study Group, 1.

⁴ Ibid, 2.

⁵ Ibid, 3.

⁶ Ibid, 1-2.

⁷ Department of Defense Office of Force Transformation, *Military Transformation: A Strategic Approach* (Washington: Director, Force Transformation, Office of the Secretary of Defense, 2003) 8.

⁸ Transformation Study Group, 6.

⁹ Andrew Feickert, *The Army's Future Combat System; Background and Issues for Congress*, CRS Report for Congress, April 28, 2005, pg.CRS-2.

¹⁰ General Richard B. Myers, USAF, Chairman of the Joint Chiefs of Staff, "A Word From the Chairman," *Joint Force Quarterly* 38 (3rd Qtr, 2005): 5.

¹¹ Ibid, 5.

¹² Schoomaker and Brownlee, pg. 1-1.

¹³ Ibid, pg. 1-1.

¹⁴ Ibid, pg. 1-2.

¹⁵ Myers, 5.

¹⁶ Schoomaker and Brownlee, pg. 1-4.

¹⁷ Dr. David S. Alberts, John J. Garstka, and Frederick P. Stein, "Network Centric Warfare: Developing and Leveraging Information Superiority," *DoD C4ISR Cooperative Research Program*, 15.

¹⁸ Ibid

¹⁹ Ibid, 64.

²⁰ Myers, 4.

²¹ Schoomaker and Brownlee, pg. 1-2.

²² Ibid

²³ Ibid

²⁴ Maryann Lawlor, "Experts Discuss need for Speed in Communications, Acquisition," *Signal*, (August 2005): 78

²⁵ Schoomaker and Brownlee, pg. 1-2.

²⁶ Ibid, pg. 1-1.

²⁷ Ibid, vii.

²⁸ Colonel Brian Donahue, "Operationalizing the Pacific Theater Network Command (TNC) Within the Construct of the Vision Defined in the "Serving a Nation at War" White Paper signed by Acting SECARMY and CSA," (Fort Shafter, HI, March 2005):2

²⁹ Clark A. Murdock et al., "Beyond Goldwater-Nichols: U.S. Government and Defense Reform for a New Strategic Era," Center for Strategic and International Studies, (Phase 2 Report): 130

³⁰ Dennis Murphy, "Network Enabled Operations in Operations Iraqi Freedom: Initial Impressions," *Center for Strategic Leadership Issue Paper Volume 06-05* (March 2005): 1.

³¹ Alberts, Gartska, and Stein, 88

³² Arthur L. Money, "Network Centric Warfare," *Department of Defense Report to Congress* (27 July 2001): i.

³³ Colonel Brian Donahue, "Operationalizing the Pacific Theater Network Command (TNC) Within the Construct of the Vision Defined in the "Serving a Nation at War" White Paper signed by Acting SECARMY and CSA," (Fort Shafter, HI, March 2005):1.

³⁴ Dr. David S. Alberts, Richard E. Hayes, "Power to the Edge: Command...Control... in the Information Age," *DoD C4ISR Cooperative Research Program*, (Information Age Transformation Series): 2.

³⁵ Donahue, 2.

³⁶ Ibid

³⁷ Alberts, Gartska, and Stein, 65.

³⁸ Donahue, 2.

³⁹ Ibid

⁴⁰ Richard B. Myers, Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations, version 2.0*, (Washington D.C.: The Pentagon, August 2005):21

⁴¹ Richard B. Myers, Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations, version 2.0*, (Washington D.C.: The Pentagon, August 2005):9

⁴² Donahue, 2.

⁴³ Donahue, 2.

⁴⁴ Richard B. Myers, Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations, version 2.0*, (Washington D.C.: The Pentagon, August 2005):21

⁴⁵ Schoomaker and Brownlee, pg.1-8.

⁴⁶ Donahue, 2.

⁴⁷ Donald H. Rumsfeld, Secretary of Defense, "Transformation Planning Guidance," (Washington D.C., Department of Defense, April 2003): 1.

⁴⁸ Andrew Feickert, "The Army's Future Combat System; Background and Issues for Congress," CRS Report for Congress, April 28, 2005, 1.

⁴⁹ Schoomaker and Brownlee, pg. 4-3.

⁵⁰ U.S. Department of the Army, *Signal Support to Theater Operations*, Army Field Manual 6-02.45 (Washington, D.C.: U.S. Department of the Army, April 2004), pg 5-32.

⁵¹ Ibid, pg 5-34.

⁵² Russell McCray, "A New Doctrine for a New Day," *Army Communicator*, (Winter 2003): 55.

⁵³ Colonel Brian Donahue, U.S. Army, Director of Army Transformation, interview by author, 27 December 2005, Arlington, VA.

⁵⁴ Colonel Brian Donahue, "CIO/G6 Sponsored Pacific TNC Conference," briefing slides, Fort Shafter, Hawaii, 6-8 June 2005.

⁵⁵ Donahue,2.

⁵⁶ Donahue, 2.

⁵⁷ U.S. Department of the Army, *Signal Support to Theater Operations*, Army Field Manual 6-02.45 (Washington, D.C.: U.S. Department of the Army, April 2004), pgs 3-3 thru 3-5.

⁵⁸ Ibid, pg 1-2.

⁵⁹ Ibid, pg 3-2.

⁶⁰ Donahue, 2.

⁶¹ Ibid

⁶² Ibid

⁶³ Ibid

⁶⁴ Ibid

⁶⁵ Colonel Brian Donahue, U.S. Army, Director of Army Transformation, interview by author, 27 December 2005, Arlington, VA.

⁶⁶ U.S. Department of the Army, *Signal Support to Theater Operations*, Army Field Manual 6-02.45 (Washington, D.C.: U.S. Department of the Army, April 2004), pg 1-5.

⁶⁷ Ibid, pg 1-8.

⁶⁸ Ibid, pgs 1-8, 1-9.

⁶⁹ Ibid, pg 1-9.

⁷⁰ Richard B. Myers, Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations, version 2.0*, (Washington D.C.: The Pentagon, August 2005): 4-5.

⁷¹ Richard B. Myers, Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations, version 2.0*, (Washington D.C.: The Pentagon, August 2005): 4.

⁷² Money, ii.