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COMMAND INFORMATION REQUIREMENTS ON THE AIRLAND BATTLEFIELD: AN ANALYSIS OF BATTLEFIELD INFORMATION REQUIREMENTS CRITICAL TO THE FORCE COMMANDER IN THE EXECUTION OF AIRLAND BATTLE DOCTRINE, by Major John Schmader, USA, 137 pages.

This study is an analysis of the critical information requirements needed by the Force Commander to execute AirLand Battle doctrine. It uses the 85 critical information elements documented in the Force Level Information Requirements Plan (FLIRP) as a basis from which a subset of 24, which were extracted by the Combined Arms Development Activity, was evaluated. The principle sources of input for this evaluation were a survey administered to select General Officers and Command and General Staff College students, and a thorough review of current doctrine.

Among the many conclusions which can be drawn from this study are: There are different perceptions between Division and Corps Commanders versus School Commandants as to what information is critical to the execution of AirLand Battle Doctrine; there is a difference between the perceptions of Combat Arms and Combat Support and Combat Service Support; CGSC students as to what information is critical; there is a difference between the General Officers and the CGSC students as to what is critical.

The major result of this study is the identification of a set of information requirements which are critical to successful execution of AirLand Battle doctrine.

COMMAND INFORMATION REQUIREMENTS ON THE AIRLAND BATTLEFIELD

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

JOHN R. SCHRADER, MAJ, USA
B.A., Clarion State University, 1970
M.S., Purdue University, 1979

Fort Leavenworth, Kansas
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ABSTRACT

COMMAND INFORMATION REQUIREMENTS ON THE AIRLAND BATTLEFIELD: AN ANALYSIS OF BATTLEFIELD INFORMATION REQUIREMENTS CRITICAL TO THE FORCE COMMANDER IN THE EXECUTION OF AIRLAND BATTLE DOCTRINE, by Major John Schmader, USA, 137 pages.

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CHAPTER I

INTRODUCTION

> If one knows where and when a battle will be fought his troops can march a thousand LI and meet on the field. But if one knows neither the battle ground nor the day of battle, the left will be unable to aid the right, or the right, the left; the van to support the rear, or the rear, the van. How much more is this so when separated by tens of LI, or, indeed, by even a few![1]

These words spoken by the great universal military thinker Sun Tzu around 100 B.C. highlight the importance of information on the battlefield.[2] As in Sun Tzu's time, victory on the battlefield often goes to the commander who can best bring to bear the full weight of his military might on the enemy at the critical time and place.[3] One of the keys to optimizing military might is the effective and efficient use of information as a combat multiplier. Information is not fully recognized as a force multiplier as are weapon systems such as tanks, APC'S, and artillery. However, if it is collected, processed and distributed in an efficient manner, it can increase the potential of weapon systems and fully contribute to combat power.[4] Too little information can limit this capability. Too much information may significantly degrade combat power by causing delays in the decision-making process.

It was the purpose of this paper to examine information which is collected, processed and controlled by

automated systems. Then from this determine that information which is critical to the force commander for the synchronization of combat power in the execution of AirLand Battle doctrine.

BACKGROUND

The gathering, analysis, and use of information has always been a critical factor in the outcome of war. In 401 B.C., we read that Xenophon relied on captured partisans to obtain information on enemy disposition, locations, and the location of routes of safe passage.[5] Without this information, his force of 10,000 may never have safely crossed present day Turkey and reached Hellas, Greece. Another more recent example of the importance of information is found in a study of the Battle of Gettysburg during the Civil War. There the Confederacy failed to take advantage of the Union's exposed southern flank because of a lack of information as to the disposition and strength of the Union forces.[6] Had adequate information been available, Gen. Lee might have decided to conduct a flank attack, instead of the unsuccessful frontal attack which cost him numerous lives and helped signal the defeat of the Confederacy.

These manual methods of collecting and processing information remained basically the same up to the present. However, with the gradual advent of the telegraph and

eventually the radio, information could be rapidly transmitted on the battlefield. Although this may have increased the transmission capability, the analysis of information for the commander is still primarily a manual process. This manual process is at most only adequate for the conduct of the close battle.

With the advent of AirLand Battle doctrine in 1980, commanders began concentrating on fighting the rear and deep as well as the close battle. To coordinate these efforts, commanders need accurate and timely information. Although manual methods of collecting, processing, and displaying information for the commander are still used, they are rapidly losing their status as the major source of command information. Automation, with its ability to filter, fuse (combine) and process large amounts of information in relatively short periods of time, is rapidly replacing manual methods. With automation comes a new list of problems for the commander; one of these is the problem of flooding the commander with too much information. Studies have shown that too much information may hamper rather than aid the decision-making process.[7] One solution to this problem is the development and implementation of an automated command and control system which will provide the commander with only the critical information he needs to execute AirLand Battle doctrine.[8]

In 1976, before the emergence of AirLand Battle doctrine, the army leadership at the First Battlefield Automation Appraisal conducted a critical review of command and control on the modern battlefield.[9] They concluded that successful command and control was dependent on effective collection, processing, and transmission of information. This conclusion produced two results: first, that the commander required only a limited set of timely and accurate information to make battlefield decisions, and second, that automation was the answer to providing the commander with this information. This first battlefield automation appraisal laid the groundwork for development of the Command, Control, and Subordinate System architecture (grouping of systems, software, procedures).[10] This is an automation architecture designed to provide the force commander with the information he needs to successfully execute assigned tactical missions. The key to successful implementation of this architecture is the identification of information which will be automatically manipulated and processed for command use. At the Fifth Battlefield Automation Appraisal in 1980, the Command, Control, and Subordinate System architecture was formally adopted by the Army.[11] In addition, 85 key elements of information, defined in Appendix A, were originally identified and adopted as a basic set of data for use in design of the

automated systems which would make up the systemic portion of this architecture. (Further studies have since reduced this number from 85 to 83).

The Command, Control, and Subordinate System architecture provided a new way of addressing information. The architecture centered on information required to support the commander's decision-making process, and defined a system of systems composed of collection systems, filtering and processing systems, and communication systems, which used distributive processing and distributive storage to provide key information for the commander's use. The key system in this architecture is the maneuver control system. (This is an automated system designed to extrapolate key information from the battlefield and provide it to the commander in a condensed format.) Recognizing that information requirements exist within a given echelon--force level--in excess of that needed by the commander, and used for the day-to-day operation of the entire command, the force level system was defined for each echelon within the Command, Control, and Subordinate System Architecture. Its purpose is to provide an automated capability to receive, process, and transmit daily housekeeping information among the various functional areas within a given echelon -- inter-echelon. In that command information requires input from both inter and intra echelon sources, the SIGMA system was designed. SIGMA is not a physical system, but rather a

set of software and interfaces which allow automated systems at different echelons to talk together via the maneuver control system at each echelon.

From 1980 until 1983, the 85 key elements of information were used as the basis in designing the force level and maneuver control or SIGMA system. In the summer of 1983, the TRADOC System Manager for SIGMA and the Program Manager for the maneuver control system indicated that the requirement to constantly update and maintain the key 85 information elements allowed little time for analysis and manipulation of information as required by the commander.

In July 1984, at the Command and Control System Program Review II, held at Fort Gordon, Georgia, the Army leadership was appraised of this situation. As a result of this review, the Combined Arms Development Activity (CACDA) at Fort Leavenworth was tasked to develop a subset of these 85 key information elements to serve as the basis for development of a maneuver control system which will support and facilitate the commander's decision-making process.[12]

This study investigated AirLand Battle doctrine to determine if a minimum subset of information can be taken from the 85 key information elements to support and facilitate the decision-making process.

ABBREVIATIONS AND DEFINITIONS

The area of Army command and control abounds with unique acronyms and definitions. The creation of new acronyms and abbreviations for this thesis has been avoided as much as possible. Some key terms are:

Force Commander: The senior commander at each echelon who establishes the concept of the operation.

Force Level System: A set of automated and manual systems, software and procedures which facilitate the collection processing, storage, and display of information for use by the force commander.

Maneuver Control System: The automated system which the force commander uses to interface with the force level system.

Command, Control, and Subordinate System architecture: An automated architecture which uses distributive processing and storage of information as a basis for tying together the five battlefield functional areas of maneuver, fire support, intelligence and electronic warfare, combat service support, and air defense. Each functional area is controlled by a functional control system. Within this architecture, the maneuver control system controls the maneuver functions. The force level system is the hardware, software, and data elements which tie these five functional areas together. The 85 key

information elements, identified earlier, constitute the data which is passed through the force level systems between the five functional control systems.

Doctrinal Information: Information that is identified within current doctrine as necessary for successful execution of the doctrine.

Field Information: That information, which is compatible with doctrinal information, that force commanders apply in accordance with the factors of mission, enemy, time, terrain, and troops available in the application of doctrine.

PURPOSE

This thesis reviewed the results of past efforts to identify key information which is critical to successful execution of assigned battlefield missions. It compared the type and amount of information required by current doctrine and that which current field commanders indicate is needed. It applied the key information to AirLand Battle doctrine and developed a subset of the 85 key information elements which, if applied to an automated command and control system, will facilitate the tactical decision-making process.

HYPOTHESIS

There exists a minimum subset of the original 85 key information elements (formatted data) which if immediately available in real time via an automated command and control system is sufficient for a force commander to successfully execute AirLand Battle Doctrine.

RESEARCH QUESTIONS:

This study sought to answer the following questions:

1. Doctrinally, what are the key critical information elements which a force commander must have to successfully execute AirLand Battle doctrine?

2. What modifications, if any, must force commanders make to doctrine generated information requirements to successfully execute AirLand Battle doctrine?

3. Do these modifications to doctrinal information requirements result in a change to the 85 key information elements, the development of an entirely new set of information elements, or a combination of the two?

4. Is there a minimum subset of the 85 key information elements which are doctrinally sound and still satisfy the force commanders requirements for successful execution of AirLand Battle doctrine in the field?

RESEARCH OBJECTIVES

In answering the above questions, the following objectives were established:

1. To define the key information requirements necessary by doctrine for a force commander to execute AirLand Battle doctrine.

2. To identify any additional field information requirements necessary for a force commander to successfully execute AirLand Battle doctrine.

3. To determine the relationship between the key information required by the doctrine and its application in the field.

4. To derive a subset of the 85 key information elements which can be produced by an automated command and control system and will facilitate successful execution of AirLand Battle doctrine.

METHODOLOGY

The area of command and control is inundated with studies on management information systems and the application of leadership techniques and technology. The major shortcoming is that the majority primarily address the mechanics of a command and control system and few, if any, address the information which is used therein.

This thesis was a continuation of three and a half years of effort, by the author, while assigned to the Combined Arms Combat Development Activity, to identify the AirLand Battle requirements for the Army command and control system and then satisfy them through the application of

technology to collecting, processing, and transmitting information.

The next step was to identify the bounds of the available information and attempt to eliminate information not critical to the commander in the execution of doctrine.

To develop a limited set of information required for the successful execution of doctrine, it was first necessary to review current (AirLand Battle) doctrine and identify the information which is doctrinally required by a force commander. In as much as doctrine is a set of guidelines rather than a rigid procedure, interpretation by field users often requires changes for execution. It was therefore necessary to sample a population of field users, both staff officers and current commanders (general officers), to determine what information is required in the actual implementation of AirLand Battle doctrine. The staff officers sampled were from Section 3, Command and General Staff College Class of 1985. A copy of the survey sheet is at Appendix B. Their responses were based on classroom instruction and past experience. Results of this survey are at Chapter 4. The general officer survey was conducted by CACDA. Their responses were based on previous exercises where they implemented and used AirLand Battle doctrine. Results of responses received are contained in Chapter 5. Administering the same survey sheet to both the general

officers and CGSC student, aided in determining from a both a commander's and staff perspective of what is important. This permitted the comparison of their responses and the derivation of a list of common information items. By comparing the items revealed in a literature search with those of the two surveys, a common list of critical information was developed.

SCOPE, LIMITATIONS, AND ASSUMPTIONS

Limitations: This study focuses on the corps and division commanders in the execution of AirLand Battle doctrine. The lack of current literature available which identifies critical decisions made in the execution of AirLand Battle doctrine was a limitation in the study. This study is not concerned with the decision making process nor does it trace information through it.

Scope: The scope of this study was on the operational opposed to the logistical requirements required to execute AirLand Battle doctrine. This study looked at the information provided by division and theater to the corps but did not look at the analyses, development, or distribution and use of that information within the division and theater.

Assumptions: Several important assumptions were made which are critical to this thesis. The first assumption dealt with the decisions made on the battlefield. To

establish a set of information which has utility over time, it was assumed that the basic tactical decisions required to execute AirLand Battle doctrine will not change over the course of this study.[13] A supporting assumption was that there exists a minimum set of the 85 key information elements which are electronically processed, stored, and maintained by automated data processing systems, that a commander must have to execute tactical decisions.

With the advent of automation and the increased roles which management information systems play on the battlefield, a third assumption was that an automated command and control system will be present on the future battlefield.[14] The architecture for this automated system, developed and approved at the Fifth Battlefield Automation Appraisal held at Ft Huachuca in 1980, is the Command and Control Subordinate System.[15]

OUTLINE

Chapter 2 entitled "What's Needed?" introduces the reader to AirLand Battle doctrine and its implications for a command and control system needed to successfully implement it. Inherent within this command and control system is the information which the commander uses.

Chapter 3 presents the key information developed as a result of the doctrine search.

Chapter 4, A Staff Perspective, addresses the critical information which CGSC student survey respondents

feel is necessary for the commander to execute AirLand Battle doctrine.

Chapter 5, Commander's Perspective looks at the critical command and control information which commanders feel is necessary in executing AirLand Battle doctrine.

Chapter 6 compares the key information required by doctrine to that which staff and commanders feel is necessary (chapters 4 and 5).

Chapter 7 presents conclusions focusing on the research questions presented in this thesis, evaluates the information needed to successfully execute AirLand Battle doctrine, and identifies areas for future study.

ENDNOTES

1 Sun Tzu, The Art of War, trans. Samuel B. Griffith (New York: Oxford University Press, 1971) p. 99.

2 Ibid., p. 1.

3 Donn A. Starry, "Command and Control: An Overview," Military Review, March 1981, pp. 2-3.

4 William J. Hilsman, "Communications: Vital in Integration of the Force Multiplier,"Army, March 1979, pp. 36-38.

5 Xenophon, The March Up Country, trans. W.H.D. Rowe (Ann Arbor: The University of Michigan Press, 1964) p. xii.

6 Michael Shaara, The Killer Angels, (Ballantine Books, New York, 1974), p. 187.

7 John R. Schmader, "Command, Control, and Subordinate Systems," Briefing prepared for U.S. Army Combined Arms Combat Development Activity, 1983.

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14 Bernard L. J. Verdier and David P. Porreca, "Command and Control Systems," Military Review, November 1981, pp. 63-70.

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CHAPTER 2: WHAT'S NEEDED

This chapter traces the collection and processing of data, the technology to move it around the battlefield, and the command decisions that drive the development and maintenance of specific elements of information. It shows that the type and amount of information required on the battlefield is dictated by doctrine as interpreted by each commander -- in essense, information is user dependent.

In World War II, US doctrine was based on the fact that the US had sufficient military capability to defeat its enemies. This military capability was reinforced by the economic potential of the world's most industrialized nation. So great was the US's power that it gave the nation a feeling of superiority and actually helped drive the how to fight doctrine.[1] Since then, changes in the world balance of power have consequently changed the US's tactical doctrine. The first real evidence of this occurred in the Korean War where the US's newfound edge in technology began to fade for the first time as a result of espionage and the resulting technolcgical advances of the rest of the world.[2]

Since the Korean War, US doctrine has continued to change based on the enemy's ability to wage war. The

predominate Land battle doctrine of the 1970's was the Active Defense. This doctine was based on a conflict against a superior force where the US traded space for time. A major shortcoming of the active defense was that it did not allow for offensive initiative which is necessary for victory. Realizing that a conflict in Europe would pit the US against a numerically superior force, the Army began to change its doctrine. This new doctrine was based on the enemy's ability to concentrate overwhelming mass at critical times and places to achieve decisive engagements on the Forward Line of Troops (FLOT) while simultaneously attacking the rear logistical area in an attempt to interrupt the logistical base.[3] This new threat demanded a command and control system which would enable the US to identify where the enemy was massing, the location and disposition of reserves, and the quick accurate assessment of attacks on our logistical base and supporting Lines of Communications (LOCs). In essence, the commander was looking at the possibility of fighting three distinct but simultaneous and related battles -- the rear, close-in, and the deep.[4] This new doctrine was termed AirLand Battle doctrine.

The command, control and supporting information for each of these battles is different. In the deep battle, the commander is attempting to influence follow-on forces. For the corps commander the follow-on forces are the second-echelon armies. The goal is to disrupt these follow-on

forces before they can move to positions from which they can influence the close-in battle. At corps level, this requires an intelligence system which can look out to the enemy's rear, and a supporting communication system capable of transferring this information back to the Tactical Operation Center (TOC), where the information is filtered, fused and analyzed for use by the commander.[5]

To effect the outcome of the close-in battle by delaying or disrupting follow-on forces, the corps commander requires the ability to use the information just provided him to accurately locate the enemy. He must then evaluate his ability to disrupt the enemy's intention and instantly relay the target data to a weapon system which can strike deep before the enemy target moves.[6] This demands a method and organization of information which supports the rapid categorization, filtering, and transformation of this information into a usable format.

The close-in battle is fought primarily by the division commander and his major subordinate commanders. As with the deep battle, the enemy must be accurately located, identified, and targeted.[7] Information needs of these commanders must dictate the capabilities of the command and control system which will give them the capability to accomplish this. Although the close-in battle is fought by the divisions, the corps commander retains responsibility for allocating resources and the commitment of the corps

reserve at the critical time and place. Often the corps level of information required to support the close-in battle places additional demands on the corps command and control system. These additional demands further highlight the need for a corps command and control system which can readily classify and organize data into usable information.

The third aspect of the airland battlefield is the rear battle. Long overlooked as a separate entity on the battlefield, the rear battle has become a reality. This is a result of the enemy's ability to move special operation forces by air and/or ground infiltration means to the rear of the FLOT. The threat to the logistical base has added a new dimension to command and control and the subsequent information required to support it.

Fighting three separate and distinct battles requires that information be properly organized so that the commander is neither flooded with detail or suffers from a lack of critical information.[8] With automated collection and processing systems, all information can be made readily available to the commander. It is imperative to effective battlefield operations that the commander retain the freedom of movement on the battlefield from which he can best influence the battle, yet still have the necessary information available to him.[9]

The commander's ability to influence the battle is often the key element in full utilization of available

combat power. The commander must be capable of acting faster than the enemy so that he can gain and retain the initiative and attack the enemy before the enemy can react. Historically, two major problems have prevented the commander from effectively using information. The first is the communication system which moves the information around on the battlefield. The second is the operational reporting procedure where everything is reported sequentially from the lowest element collecting the information through the chain of command to the commander.[10] The operational reporting procedure is characterized by the fact that in each step of this process the information is analyzed, interpreted, and retransmitted with little or no filtering being done. This serves to aggravate the problem by attributing a false sense of importance to each piece of information which is collected. The result is that every piece of information, be it tactical or logistical, is transferred to the commander for use in the decision-making process.

At the Battlefield Automation Appraisal number five held at Fort Huachuca, Arizona in 1980, the army senior leadership identified this as a major command and control problem. They approved a list of 85 key information elements to serve as a baseline for controlling this influx of information.[11] These 85 elements of information were designed to provide the corps commander with the key

information that he needs to accomplish any battlefield mission. A major shortcoming of these 85 elements of information is that because of their complexity and detail they may in fact be guilty of the very problem which they seek to solve--limiting the information provided to the commander to only that necessary to successfully accomplish battlefield missions. To adequately evaluate the effectiveness of this information as an aid to the commander in the decision process, one must first determine what tactical decisions are made by the commander on the battlefield and then determine the type of information required to support these decisions. Having determined the type of information required, one can then compare it to these 85 and determine if a subset of the 85 exists which can satisfy the information needed for the commander's decision process.

To gain insight into how information is generated and used, one can view a battle in terms of three distinct but inter-related phases -- before the battle (pre), during the battle (execution), and after the battle (post). The information supporting these phases is often the result of a building block process whereby the information is collected and processed in the pre phase, used in the execution phase, and re-evaluated in the post phase. During each of these phases, information is constantly being updated and changed. Therefore, the information which was initiated in the pre

phase may not be the same as that re-evaluated in the post phase. A further refinement of this information within each phase, is the breakdown of information into three categories based on how it is collected, filtered, analyzed, and used.

The lowest of the three categories of information is defined as technical information. This is information in its raw form and represents data which has just been or is being collected. This data is both friendly and enemy in nature. It encompasses logistical, administrative, and general information on the status of friendly forces, as well as disposition, sitings, and locations of enemy units. Because of its content and relevance to the battle, this data, in its raw state, is of little value to the force commander.[12]

The raw data which makes up technical information is passed from the collection systems to staff systems -- systems in this context can mean either a system or a person -- which filter, analyze, and process it into a usable format.[13] At this point it starts to take on the appearance of staff information. At the staff level, information begins its transformation from raw data to that of key information critical to the decision-making process. Within the staff level of information, there are two distinct classes of information based on who uses it. The first is that information which staff officers pass among

themselves and to their subordinates in the conduct of day-to-day activities. The second type of information is labeled as command information and represents the final information products which the staff pass to the commander for use in executing the battle.[14] At times, information may circumvent the entire aforementioned process and go straight from a collection system to the commander without going through the staff. An example of this is the location of key enemy targets. Often, this type of information is identified ahead of time within the Essential Elements of Information portion of the operation order. This bypass process may also take place with friendly information which is not identified as such in the operation order, but rather identified by the commander. Examples of friendly information which go straight from collector to the commander may include status and disposition of tactical units or the status of critical weapon systems.[15]

These three classes of information -- technical, staff, and command -- support the command and control associated with battlefield functions required in any conflict. In 1982, the Army Command and Control Master Plan identified three major functions which rely on this information in the execution of battlefield operations. These three functions are plan, direct, and execute.[16] Within these three functions, seven tasks are identified

which purport to represent the command and control tasks which a commander must accomplish in the execution of AirLand Battle Doctrine. These seven tasks, categorized under the appropriate function, and the supporting level of information are:

* The function of planning which basically requires technical information. Within the function of plan are the tasks of:

**See the situation both enemy and friendly.

**Evaluate the mission with respect to assigned missions and orders, and develop priorities.

**Develop a plan to support the assigned mission.

* The function of directing requires some technical but mainly staff information. Within the function of direct are the tasks of:

** Allocate resources, to include combat, combat support, and combat service support, necessary to accomplish the mission.

**Coordinate the assignment, allocation, and reallocation of resources.

* The function of execution, as shown previously, uses some technical but mainly staff and command information. Within the function of execution are the tasks of:

**Fight the rear, close-in, and deep battles.

** Sustain all three battles simultaneously if required.[17]

In the accomplishment of the planning function, there are certain actions which the force commander must do to initiate the planning process. First, he must define the unit mission. Based on the mission, he next establishes the unit objectives. Next he states his intent and develops a concept of the operations to accomplish these objectives. The commander then assigns primary missions to subordinate units and assigns reinforcing missions.[18] These actions must be accomplished across the depth of the battlefield and in sufficient time and detail to permit adequate development of a plan by the staff.

Within the function of direct, the major objective is the tailoring of forces to support combat, combat support, and combat service support requirements.[19] Once the commander has made his decision on the proper allocation of resources, his staff assumes primary responsibility for the actual movement of resources to accomplish their objectives in conjunction with the overall plan.[20] This also includes such things as exchange of Communication and Electronics Operating Instructions (CEOIs), Liaison Officers, and Operation Plans and Orders within the total force structure.[21] It is in the execution phase that the

commander needs accurate and timely information with which to both implement his plan and make necessary adjustments to it.[22]

So far the different functions and tasks required of the commander on the AirLand Battlefield, as well as the different classes of information required to execute these functions and tasks have been identified. The next step is to establish the type and amount of information required by the force commander, its source, and its relative value to the outcome of the battle.

The value of accurate and timely information in helping determine the outcome of battle has always been of major interest to battlefield commanders. It is only since 1979 that the Army has taken any positive steps to identify, classify, and sort out information critical to the battle. The Corps Information Flow Study conducted by the Combined Arms Development Activity (CACDA) at Fort Leavenworth, published in 1979, was the first document to attempt to identify the information which a commander needs to successfully execute combat missions. This study was implemented by General Donn Starry when he served as the TRADOC Commander. It resulted as a direct outcome of Task Force Charlie, which was developed in 1976 in V Corps Germany by General Starry, then the V Corps Commander. Task Force Charlie's charter was to identify command and control

deficiencies within V Corps. In addition to identifying command and control deficiencies, a synergistic finding of Task Force Charlie was that battlefield information was hard to articulate because it had never been identified.[23] Understanding the importance of information to command and control and its effect on the outcome of battle, General Starry directed the conduct of the Corps Information Flow Study.

The Corps Information Flow Study was conducted as a functional analysis. It first identified the battlefield functions, then traced the information flow through the corps to accomplish these functions. The results of this study produced a list of 38 minimum information needs of the corps commander. These 38 represented only those needed by the commander and did not represent the information required by the corps staff or the subordinate commanders.[24] This list of 38 information needs was broken down into three major categories: intelligence, operations, and personnel/ logistics. These 38 minimum information needs are shown in Table 2-1. Although this study achieved the desired goal of identifying the corps commander's minimum information needs, it had several major drawbacks. First it was oriented primarily on a US corps deployed in USAREUR. It did not take into consideration the requirements of a contingency corps operation. Second, it looked at information which could be gathered and processed in a manual manner. With the advent

CORPS COMMANDER'S INFORMATION NEEDS

INTELLIGENCE:

- Enemy Regimental Avenues of Approach
- Location and Composition of Enemy Nuclear Capable Units
- Location of Enemy 1st Echelon (Regiments & Divisions)
- Location of Enemy 2nd Echelon (Divisions, Armies & Fronts)
- Major Enemy Concentrations out to approximately 300 KM from FEBA
- Probable Enemy Course of Action
- Significant Enemy Movement in Past 48 Hours

OPERATIONS:

- ADA Coverage Gaps
- ADA Unit Locations
- Current and Projected Status of Roads, Bridges, Railways, Urban Areas, Pipelines, and Airports
- FA Missions
- FA Unit Compositions
- Force Ratios
- Major Critical Incidents
- Maneuver and FA Battalion Locations
- Maneuver Task Organization for Combat
- Maneuver Unit Activity and Commander Assessment
- Maneuver Unit Communications Outages
- Nuclear Weapons: Prescribed Nuclear Load
- Reserve Maneuver Unit Identification/Location/Status
- Uncommitted Maneuver Force Identification/Location/Availability
- USAF Sortie Projection/Weather/Comments
- USAF Sorties Requested/Approved
- USAF Sorties Remaining

PERSONNEL/LOGISTICS:

- ADA Unit Ammunition Status
- Class III Acceptable Corps Levels
- Class III Levels in COSCOM
- Class V Acceptable Corps Levels
- Class V Levels in COSCOM
- Class VII Operationally Ready
- Class VII On Hand in COSCOM
- Class VII GS Repair Estimate
- Class VII Projected Corps Gains
- FA Unit Class V Status
- FA Unit Firing Status (Crew and Equipment)
- Maneuver Unit Critical Shortages of Classes III and V
- Maneuver Unit Weapon Status (Crews and Equipments)
- Uncommitted Maneuver Force Status (Crews and Equipment)

SOURCE: U.S. ARMY, PHASE I: CORPS INFORMATION FLOW, 1979: PP. A-1, 2.

TABLE 2-1

of the computer and its application to providing information for the decision process, manually gathered and processed information, although important, can no longer represent the full capability available to the commander. And, finally, it looked at information needed to implement the active defense, the precursor to the current AirLand Battle doctrine.[25] In an attempt to expand these 38 minimum information needs to address any type corps operating anywhere in the world and bring them in line with AirLand Battle doctrine, the Command, Control, Communication, and Intelligence Directorate within CACDA developed the Force Level Information Requirement Plan (FLIRP).[26] Within the FLIRP, these 38 were expanded to 85 in the following four categories: enemy information, friendly information, plans/orders-mission, and other information/environment. These 85 key elements of information would later be used as a basis for the development of an automated command and control system.

About the same time the results of the Corps information flow were presented to the Army, a separate but related initiative was taking place within the Army. This effort was the development of an automated command and control architecture to support command and control. This architecture, designated as the Command and Control

Subordinate System (CCS^2) was designed specifically to provide a given force level with the capability to automatically collect, transfer, filter, process, analyze, and present information.[27] The primary components of the CCS^2 architecture were five automated systems -- one each for the functional areas of Maneuver, Fire Support, Intelligence and Electronic Warfare, Combat Service Support, and Air Defense Artillery -- connected together with the capability to automatically process and distribute selected information.[28] The major objective of this system was to use automation as an aid in identifying, developing, and providing the force Land Commander with that information which he needs to successfully execute assigned missions.[29] Since the CCS^2 architecture was designed to support the Force Commander's decision process, one part of it required designation as the control mechanism. That part is the Manuever Control System. A major design consideration in developing the Maneuver Control System has been the identification of the data elements which it would be responsible for managing.

In 1983, the draft system specification for the maneuver control system was developed. This draft specification used the 85 key information items as the basis for designing the system interfaces between the maneuver control system and the control systems for the functional

areas of fire support, combat service support, intelligence and electronic warfare, and air defense.[30] In 1984, these 85 key information elements had been reduced to 83 as a result of the design of the information exchange matrixes between the maneuver control and the other four control systems.[31] In July 1984, these key information elements were used as a basis for design of the information exchange requirements in the Operational and Organizational (O&O) Plan for the Maneuver Control System. The key information elements were to be present in all five of the functional area data bases, and were designed to provide the commander with information on friendly units, locations, combat power, and activity, enemy unit locations, strength and activity, as well as, mission and terrain information in a useable format.[32]

Having identified the system which will manage critical information for the Force Commander, and a proposed list of key information elements, the type of decisions which a Force Level Commander must make will now be examined. By knowing the decisions, the 85 identified key information elements can be evaluated for applicability to AirLand Battle doctrine. This investigation will be restricted to the Corps and Division and will concentrate primarily on the information required during the execution phase of a mission.

A review of the literature revealed that little research had been done in identifying the decisions which a Force Commander must make. The majority of the literature deals with Army level decisions and their strategic impact on national policy. However, since this investigation concentrated on actions which a Force Commander must take in the execution phase of assigned tactical missions, the majority of these studies contributed little to this study. One study, however, did provide valuable insight into tactical decisions and the information that supports them. This study was produced by the BETAC Corporation, which in 1981 was chartered by Headquarters Department of the Army (HQDA) to evaluate and assess national intelligence support to operational commanders. This study was concerned with capturing the basic core of information which a commander is concerned with during specific stages of a conflict.[33] This survey consisted of interviews with 13 Army officers who had served as Allied Army Group, Corps, Division, and Brigade commanders.[34] They looked at five escalting stages of a conflict -- strategic warning, tactical warning, advance to contact, contact, and heavy engagement. For the purpose of this study, I concentrated mainly on the results of the Contact/Engagement and Heavy Engagement phases of the conflict.

Within the Contact/Engagement Phase, the following tasks were determined to be critical to the Corps Commander:

- allocate air and artillery support to ground forces
- monitor their own situation
  -- emphasis on limiting factors
  -- can Corps GDP be executed
- position reserves
- provide commanders perceptions to the staff
- determine the main part of attack.[35]

The following information was determined to be essential in support of these tasks

- enemy objectives
  -- location of main atack
  -- ground and air objectives
  -- size of main attack
- enemy reinforcements
  -- movement
  -- location
  -- direction
- enemy NBC intentions
- exploitable targets
  -- weaknesses
- status of friendly units
  -- locations
- enemy order of battle
- terrain and weather changes[36]

The Corps tasks to support the heavy engagement phase are:

- take advantage of knowledge of
  -- enemy equipment
  -- enemy doctrine/tactics
  -- terrain

- regenerate combat power
  -- change boundaries
  -- shift artillery and TAC Air support position/commit reserves

- regenerate combat power at battalion level [37]

The information needs to support the engagement tasks are:

- enemy objectives
  -- location of main attack
  -- nationality
  -- ground and air objectives
  -- size of main attack

- enemy reinforcements

- enemy NBC intentions

- exploitable targets -- weaknesses

- terrain and weather changes

- enemy order of battle

- status of friendly forces -- location [38]

The study produced a prioritized list, Figure 2-2, of commanders' ten major information concerns. An important outcome of this study is the fact that the first item was at least twice as critical as the second item.[40] (Defense of the ranking information concerns was not done because the differences were not that great.) This showed that the commanders' main concern for information at any echelon is for information on the main attack of the enemy.

Another major finding of the BETAC study is that a Corps Commander's information requirement for enemy vs friendly information peaked during the tactical warning

COMMANDERS' MAJOR INFORMATION CONCERNS

Enemy main attack/concentrations (where, when & in what strength and type)

Friendly intelligence systems capabilities of enemy countermeasures

Enemy unit data (location, ID, strength, etc.)

Non-specific friendly force readiness/status

GDP positions/plan related data

Friendly supply status (ammo, POL, food)

Enemy use of nuclear weapons (delivery unit location, activity at nuclear storage sites, etc.)

Significant changes (not tied to a specific enemy intention/action)

Enemy unit type

Enemy reinforcements/2nd & 3rd echelon (size, speed, direction, type) [39]

FIGURE 2-2

Source: U.S. Army, Exploration of Tactical Commanders Key Information Concerns (1981): p. 2-27.

phase and dropped off for the advance to contact, contact, and heavy engagement phase.[41] This was explained by one of the respondents who indicated that his need for enemy information peaked during the planning phase because after the battle started, his ability to influence the battle consisted of reallocating friendly forces. Therefore his emphasis shifted from enemy to friendly information.[42] At Division and Brigade the information concerns were reversed. Both the Division and Brigade required more information about friendly than enemy activities during the preparatory stages of conflict. Then as the conflict progressed to more advanced stages of engagement, the need for enemy information steadily increased for the Brigade, and peaked for the Division during the contact phase prior to getting into the heavy engagement phase.[43] This supports the need for the Division Commander to influence the battle early on, before the Brigades are totally committed. The information available to the Division Commander must, therefore, support the initial use of the Brigades.

The BETAC study next looked at the question of what type of information the commander wanted. The results were unanimous across all echelons. During the planning phase of a battle, each commander displayed a high need for details on the enemy. As the battle progressed, commanders became less concerned about details and became more concerned about

the intentions of the enemy.[44] This can be explained by looking at the decision process. In the development of an operation order, the major emphasis is on our ability to defeat the enemy. In wargaming and developing his course of action, the Corps and Division commanders array Brigades and Battalions against known enemy positions and capabilities.[45] Once the battle starts the commander redirects the focus of his attention on the interdiction of follow-on forces.[46] To successfully interdict and halt these reinforcements, the commander must be able to accurately identify the enemy's intentions. This requires that the commander have the capability to accurately and rapidly collect, filter, process and use information. This is supported by yet another finding of the BETAC study which showed that commanders prefer processed or refined information to semi-processed or raw data.[47] The results of the BETAC Study provide an invaluable insight into the type of information required during the various phases of battle by commanders at different echelons.

SUMMARY

This chapter traced the development of the 85 key information elements, and demonstrated their impact in the development of an automated command and control system and how and where they are used on the battlefield. The

remaining chapters will look at identifying a subset of these 85 which will satisfy the critical information needs of a commander on the AirLand battlefield.

ENDNOTES

[1] U.S. Army, Army Command and Control Master Plan with Mission Area Analysis (1983): p. 11.

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[4] Donn A. Starry, "Command and Control: An Overview," Military Review, November 1981, pp. 2-3.

[5] Clarence E. McKnight, "The AirLand Battle: Understanding the Concept, Communications to Win," The Army Communicator, Fall 1981, pp. 5-9.

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[7] FM 100-5 (1982): pp. 7-2, 7-3.

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[10] Ibid.

[11] Minutes of the Meeting of the Fifth Battlefield Automation Appraisal, Held at Ft Huachuca, AZ. 1980.

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[13] Army Master Plan (1983): p. 19.

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[15] Ibid.

[16] Ibid., pp. 106-108.

[17] Ibid., p. 109.

[18] U.S. Army, FC 100-15, CORPS OPERATIONS (1984): pp. 3-8.

19 Army Master Plan (1983): p. 107.

20 FM 100-5 (1982): pp. 2-1, 2-5.

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22 U.S. Army, Phase I, Corps Information Flow (1979): p. 3.

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26 U.S. Army, Force Level Information Flow (1979): p. 3.

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30 U.S. Army, Draft System Specification for the Maneuver Control System (1983): p. 127.

31 U.S. Army, Army Battlefield Interface Concept (ABIC) (198): p._.

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33 U.S. Army, Exploration of Tactical Commanders Key Information Concerns (1981): p. 1-1.

34 Ibid., p. 2-2.

35 Ibid., p. 2-14.

36 Ibid., p. 2-19.

37 Ibid., p. 2-15.

38 Ibid., p. 2-20.

39 Ibid., p. 2-27.

40 Ibid., p. 2-26.

41 Ibid., p. 2-28.

42 Ibid.

43 Ibid., p. 2-29.

44 Ibid., p. 2-33.

45 U.S. Army, FC 100-9, A Guide to the Appreciation of the Estimate of the Situation (1984): chapter 4.

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CHAPTER 3

DOCTRINAL REQUIREMENTS

This chapter deals with the information required doctrinally to execute AirLand Battle doctrine. The information requirements represented herein were extracted from current publications that depict the AirLand Battle doctrine. In addressing battlefield Command and Control doctrinal requirements, it is not enough to address only US doctrine, but we must also look at how and where that doctrine is to be applied.

The ultimate goal of any combat unit is the defeat of the enemy. At corps level this is accomplished by acting faster than the enemy and keeping him off balance by a rapid change in tactics. These rapid changes can only be obtained through command and control.[1] This requires that our command and control systems be faster and more efficient than his. Speed is measured in how well we disrupt his plans. Efficiency is measured in how well the commander's intents are carried out and the ability of the command and control system to support changes in the situation.[2] These are the precepts which drive the refinement of and will ensure successful execution of AirLand Battle doctrine.[3] Inherent in these precepts is the need for our command and control system to function faster than the

enemy's so that we can synchronize our combat power at the critical time and place.[4] As in any race, one can win only by knowing his opponent's speed and racing faster. Likewise, to develop a command and control system which is faster and more efficient than the enemy's, we must first understand his system and the information contained therein. Then we can develop a command and control system that is geared to efficiency and speed and will give us the capability to function faster than the enemy.

At Figure 3-1 is a listing of Soviet information requirements for the tactical levels of war.[5] Although, it is designed for battalion commanders and staffs, it is believed to be applicable at higher levels of command. The list contains nine major information groups. Within these nine major information groups are listed 81 specific elements of information. Upon close inspection, as described below, one can see that many of these 81 correlate very closely to the 83 FLIR's identified in the U.S. development data. The major difference in the two lists is that the Soviet list of information is broken down into the nine categories, as shown at Figure 3-1, and includes the human and sociopolitical aspects of the battlefield. The U.S. list has only four categories -- Enemy Information, Friendly Information, Plans/Orders - Missions, Other Information/Environment -- and does not directly address

SOVIET INFORMATION REQUIREMENTS FOR OPERATIONAL AND TACTICAL LEVELS OF WAR

(MANDATORY FOR BATTALION COMMANDERS AND STAFF)

I. COMBAT SITUATION INFORMATION:

- A. ENEMY
- B. FRIENDLY
- C. ADJACENT UNITS
- D. RADIATION SITUATION
- E. TERRAIN
- F. HYDROMETEOROLOGICAL CONDITIONS
- G. TIME OF YEAR AND TIME OF DAY
- H. ECONOMIC CONDITION OF THE COMBAT ZONE
- I. SOCIOPOLITICAL MAKEUP OF THE POPULATION

II. THE ENEMY:

- A. NUMERICAL STRENGTH
- B. MORALE
- C. COMMAND AND CONTROL SYSTEM
- D. ENGINEER EQUIPMENT
- E. POSSIBLE NATURE AND METHODS OF ENEMY OPERATIONS BEFORE AND DURING COMBAT
- F. ATTITUDE OF ENEMY PERSONNEL TOWARD THE GIVEN WAR
- G. MUTUAL RELATIONSHIP BETWEEN OFFICERS AND ENLISTED
- H. SOCIOPOLITICAL MAKEUP OF THE ENEMY FORCE
- I. LEVEL OF COMBAT TRAINING
- J. CREATIVE, VOLITIONAL, AND ORGANIZATIONAL CAPACITIES OF THE COMMANDERS
- K. STABILITY OF ENEMY PERSONNEL IN A DIFFICULT SITUATION
- L. ENEMY'S STRONG AND WEAK POINTS

"THERE IS NO EXCESS OF INFORMATION ABOUT THE ENEMY; ON THE CONTRARY, THERE IS ALWAYS A LACK OF INFORMATION."

III. FRIENDLY TROOPS:

- A. POSITION
- B. EFFECTIVE COMBAT STRENGTH
- C. GROUPING
- D. MISSION TO BE PERFORMED
- E. COMBAT EFFECTIVENESS OF THE TROOPS
  1. NUMERICAL STRENGTH
  2. AVAILABILITY AND CONDITION OF EQUIPMENT

3. POLITICAL-MORALE STATE AND LEVEL OF TRAINING OF PERSONNEL
4. LOCATION AND STATE1 OF REAR SERVICES
5. MEANS FOR BRINGING UP MATERIEL
6. RENDERING MEDICAL AID

F. TIME AVAILABLE

IV. ADJACENT UNITS:

A. POSITION
B. CONDITION
C. NATURE OF OPERATIONS
D. GROUPING
E. CONTENT OF TACTICAL MISSION
F. RESULTS OF EXECUTION AND CONDITIONS OF COORDINATION

V. RADIATION SITUATION

A. TYPE
B. TIME
C. METHOD OF CONTAMINATION OF THE COMBAT ZONE
D. DISTRIBUTION OF THE RADIATION LEVELS
E. CONTAMINATION VARIANCE WITH TIME

VI. TERRAIN:

A. NATURE AND TYPE RELIEF
B. NATURAL AND ARTIFICIAL OBSTACLES, AND HYDRAULIC ENGINEERING STRUCTURES
C. CONDITIONS FOR PROTECTION AGAINST NUCLEAR WEAPONS AND FOR CAMOUFLAGE, OBSERVATION, FIRING, AND ORIENTATION
D. ROADS AND ROAD CONDITIONS
E. NATURE OF THE GROUND
F. PASSABILITY OF THE TERRAIN AND CONDITIONS FOR MANEUVERING TROOPS OFF ROAD
G. AVAILABILITY OF BUILDING MATERIALS
H. SOURCES OF WATER SUPPLY
I. TOPOGRAPHIC POINTS
J. EFFECTS OF COMBAT

VII. HYDROMETEOROLOGICAL:

A. WEATHER CONDITIONS AND FORECAST
B. PREVAILING WINDS
C. PRECIPITATION

D. RIVER CONDITIONS (CANAL, LAKES, OR SWAMPS)
E. INFLUENCE ON PERFORMANCE OF THE TACTICAL MISSION
F. HYDRAULIC ENGINEERING STRUCTURES AND THE POSSIBILITY OF FLOODS SHOULD THESE STRUCTURES BE DESTROYED BY NUCLEAR AND FIRE STRIKES
G. PROPERTIES OF ICE AND SNOW COVER

VIII. TIME OF YEAR AND TIME OF DAY:

A. EFFECT ON COMBAT OPERATIONS

1. ROAD CONDITIONS
2. PERSONNEL CONSTRAINTS

B. LENGTH OF DAY AND NIGHT
C. MEASURES FOR TRANSITION FROM DAY TO NIGHT AND VICE VERSA
D. TERRAIN LIGHTING REQUIREMENTS
E. CAMOUFLAGE
F. PROCEDURES FOR OBSERVATION OF THE ENEMY
G. ORIENTATION
H. TARGET INDICATION

IX. ECONOMIC CONDITION AND SOCIOPOLITICAL MAKEUP OF THE POPULATION

A. REPAIR SHOP ESTABLISHMENTS
B. MEDICAL INSTITUTIONS
C. TRANSPORT FACILITIES
D. FOOD
E. FUEL
F. PUBLIC RELATIONS
G. MAINTENANCE OF ORDER IN THE REAR AREA
H. PHYSICAL SECURITY OF THE CONTROL ORGANS

SOURCE: FUNDAMENTALS OF TACTICAL COMMAND AND CONTROL, D.A. IVANOV, V.P. SAVEL'YEV, P.V. SHEMANSKIY, MOSCOW, 1977.

FIGURE 3-1

the sociopolitical aspects of the battlefield. The following lists those areas which are different and are not found in our information requirements.

- Within the category of <u>combat situation information</u>
  - -- economic condition of the combat zone
  - -- sociopolitical makeup of the population
- Within the category of <u>the enemy</u>
  - -- morale
  - -- attitude of enemy personnel toward the given war
  - -- mutual relationship between officers and enlisted
  - -- sociopolitical makeup of the enemy fore
  - -- level of combat training
  - -- creative, volitional, and organizational capacities of the commander
  - -- stability of every personnel in a different situation
  - -- enemy's strong and weak points

It is interesting at this point to note, that the Soviet view on the enemy is quite different from the U.S. Whereas, the U.S. develops large systems designed to filter, analyze, and fuse enemy information which limits the amount the commander receives, the Soviets have the philosophy that

there is no excess of information about the enemy; on the contrary, there's always a lack of information.[6] This helps to explain the Soviet's apparent focus on the human aspect of their enemy on the battlefield.

- Within the category of <u>friendly troops</u>

  -- political - morale, state and level of training of personnel

Within the U.S. structure of reporting, morale and state of training are included in the state of readiness reported by a commander and are not separate information elements available within the 83 FLIR's.

Having identified the commanders 85 information requirements and shown a comparison between our 85 and the 81 identified in Soviet literature, one can start to understand the contributions which information makes to successful execution of AirLand Battle doctrine. With this as our concept, we will now identify the information which doctrine states is necessary to successfully execute AirLand Battle doctrine. The basis for this information was the current Field Circular and Field Manuals published by the Combined Armed Center and associated TRADOC schools and centers.

To set the stage for development of information that supports AirLand Battle doctrine, we must first identify the objectives of the doctrine. Once these objectives are

known, we can then work backward to develop the types of information required to achieve these objectives. And finally, knowing the types of information required, we can then develop a list of specific information elements which make up these types of information.

FM 100-5, Operations, dated 20 August 1982, lists the following objectives of AirLand Battle doctrine:

- Indirect approaches
- Speed and violence
- Flexibility and reliance on the initiative of junior leaders
- Rapid decision making
- Clearly defined objectives and operational concepts
- A clearly designated main effort
- Deep attack [7]

The achievement of these objectives requires accurate information about the enemy. This information must identify current dispositions and locations as well as provide the basis for determination of his intentions.[8] This information if provided to the commander in its raw form would inundate him with data which he has neither the time nor the physical capability to manage and process. Therefore, it is imperative that the commander only receive processed information which he can use in his decision process. It is the duty of the staff to provide this processed information and keep the commander continuously informed of those things which he needs to know while at the same time avoiding the urge to overburden him with unnecessary information.[8]

Information required to support achievement of the aforementioned objectives is based on an analysis of the factors of of METT-T -- Mission, Enemy, Terrain, Time - Troops Available. As a result of the analysis, the commander elects to conduct either offensive or defensive operations.

Current doctrine lists five major types of offensive operations:

- Movement to Contact
- Hasty Attacks
- Deliberate Attack
- Exploitation
- Pursuit [9]

In keeping with AirLand Battle doctrine, each type of offensive operation must be considered across the total battlefield. To help ensure synchronization of assets across the total battlefield, AirLand Battle doctrine defines five distinct but coordinated elements of the offense. These elements are:

- Deep Battle
- Recon and security
- Close-in Battle
- Rear Battle
- Reserve [10]

The Command Control System must therefore be capable of providing the commander with information on each of the five elements for any offensive operation, either singularly, consecutively, or simultaneously.

The major types of defensive operations are:

- Defense
- Delay
- Defense of Encircled Forces
- Rear Area Protection Operations
- Counterattacks and Spoiling Attacks
- Withdrawals
- Reliefs to Continue the Defense[11]

As in the offense, there are five elements of the defense which correlate to AirLand Battle doctrine. These five elements of the defense are:

- Deep Battle
- Covering Force
- Main Battle Area
- Rear Area
- Reserve [12]

One can see the similarity between these five elements and the five elements of the offense. Therefore, much of the information used by the Commander in conduct of both defensive and offensive operations is similar. Only the applications changes.

Regardless of the type of operation which a commander is planning for, he has at his disposal the following resources:

- Maneuver
- Fire Support
- Deep Battle Assets
- Electronic Warfare
- Engineer Support
- Air Defense
- Signal and Command and Control
- Logistics
- Other operations (deception, psychological, unconventional warfare, employment of special operation forces, and civil-military operations).[13]

It is in the application of these resources, that the effectiveness of a command and control system can be measured. The degree of success enjoyed depends on how well they are coordinated. To effectively coordinate them requires a certain degree of information on each. The requirement that a commander must coordinate these resources, in the context of AirLand Battle doctrine, will be used as the basis to explore and identify key information which doctrinally must be present within the organization so that tasks requiring the employment of these resources can be successfully accomplished.

This information does not have to be controlled by only the Commander. He should look to the staff for the collocating of large amounts of data and presenting it to him in a usable succinct format. The commander must avoid the temptation to gather more detail than needed for fear of restricting the flow of timely, vital information.[14] Each of the aforementioned resources will be examined to identify the major actions which the commander must take and to ensure their coordination. From these actions, the information required to support them, in concert with AirLand Battle doctrine will be developed.

Maneuver - The dynamic element of the battle, the means of concentrating forces in critical areas to gain the advantage of surprise, position, and momentum which

enable small forces to defeat larger ones.[15] To effectively coordinate maneuver forces, the commander needs to accomplish the following:

- Concentrate forces - to concentrate forces, the commander needs to determine his combat ratio. This requires information on:
  - -- Friendly forces
  - -- Enemy forces
  - -- Combat multipliers[16]

From this information the commander must determine the size force required and when and where to concentrate these forces.[17]

- Determine where the critical areas are.
- Identify avenues of approach into the enemy's flanks and rear.
- Determine the location, availability, and status of fire support assets.
- Identify and assess the location of enemy strengths and weaknesses.
- Develop control measures.
- Designate axis of advance and routes of committment of reserves.
- Identify both forward and rearward air axis for both rotar and fixed wing aircraft.
- Identify routes of maneuver of supporting units.
- Determine nuclear and chemical vulnerability.[18]

Fire Support - Fire support includes mortars, field artillery, naval gunfire, and air-delivered weapons. The commander can use fire support to support his maneuver plan.[19] Coordination of fire support requires the commander to do the following:

- Know the availability of conventional vs nuclear and chemical ammunition.
- Locate and identify enemy targets.
- Ensure continuous support by designating routes of maneuver for artillery units.
- Establish target priorities.

- Develop fire control measures.
- Know the availability of air support both Army and Air Force (CAS vs BAI).
- Know the nuclear alert status.
- Consider the affect of employment of chemical weapons[20].

Deep Battle - Deep battle supports the commander's basic scheme of maneuver by attacking targets in depth. Deep battle attempts to keep the enemy from massing and creates windows of opportunity for offensive operations.[21] To coordinate deep battle, the commander must have a thorough understanding of the enemy's location, disposition, and intentions. Coordination of deep battle requires the commander to do the following:

- Identify high value targets.
- Synchronize of deep attack assets.
- Develop a valid deception plan.
- Determine the availability of deep attack assets.
- Have detailed knowledge of the terrain.
- Have accurate weather forecasts.
- Understand the bounds of his area of influence and area of interest.[22]

Electronic Warfare (EW) - Consists of electronic support measures (ESM), electronic countermeasures (ECM), and electronic counter countermeasures (ECCM).[23] EW can support operations by deception, locating enemy transmitters, intercepting transmissions, and disrupting enemy C^2. Coordination of EW requires the commander to:

- Know his EW capability.
- Know the status of his EW assets.
- Identify which sets to jam.[24]

Engineer Support - Preserves the freedom of maneuver of friendly forces; obstructs the maneuvers of enemy forces; and it enhances survivability of friendly forces.[25] Effective employment of engineer reserves requires that the commander:

- Develop priorities for engineer support.
- Follow theater policy on denial in developing a denial plan.[26]

Air Defense - All air defense systems must be integrated to preclude the attack of friendly aircraft and to engage hostile aircraft.[27] Unlike the other resources, air defense assets belong to the Army, but are controlled by the Air Force Component Commander in the theater. Therefore the Army force commander's primary concern is not engagement status but rather the physical location, readiness status, and employment of air defense assets. Air defense coordination requires the commander to:

- Ensure constant coverage during mobile operations.[28]

Communications - Means for transmitting information and orders.[29] Communications provide the backbone of the commander's command and control system. Fighting three consecutive battles on a fluid battlefield requires that a commander have positive communication with his forces. This communication system can consist of messenger, wire, radio, or high speed data links.[30] To ensure adequate communications, the commander must:

- Understand the capabilities and limitations of his communication system.
- Provide for security of communication systems.[31]

Logistics - the means of sustaining the fighting force. In the execution of maneuver, logistics may well be the major limiting factor. As the battle progresses, the need for ammunition, fuel, and maintenance will increase. Transportation and maintenance of the fighting force become increasingly important. In addition to providing logistical support, the commander must be aware of the threat to the logistical base and his lines of communication. Coordination of logistics therefore requires the commander to:

- Plan for mobile resupply.
- Provide adequate resupply to maintain the initiative and continue the attack.
- Provide security for his logistical base and LOC.
- Monitor the status of critical classes of supply.

Other Operations - Operations within this category are controlled primarily at the staff level. The staff must ensure they comply with the intent of the commander and appraise him as needed. Although important to the overall plan, coordination of these activities often requires little more than guidance by the commander with follow-up information provided back to him by the staff. Therefore, they are not considered to be significant enough to warrant further examination within the scope of this study.

In identifying the specific information elements necessary to support coordination of each of the aforementioned resources, the 85 items contained in the FLIRP were used as the baseline from which to expand or reduce as necessary.

Analysis

The objective was to determine the relationship between the 85 FLIRP information elements and that information which a commander needs to conduct AirLand Battle doctrine. To accomplish this, the information required by the commander to effectively coordinate and employ his resources was compared with the 85 FLIRP information elements. For example, under Maneuver, one of the commander's tasks was to concentrate forces. As shown previously, the commander needs to determine his combat ratio, which requires information on friendly forces, enemy forces, and combat multipliers. The FLIRP information elements to support this include:

- Assets available (OPER by type).
- Enemy situation/assessment.
- Battle losses (Equip).
- Constraints (by area or resources).
- Enemy weapon system.
- Task organization.

This type of analysis was conducted for each of the tasks which the commander is required to do.

After completing the comparison, each of the 85 FLIRP information elements were analyzed across all tasks

and rating scheme was developed based on the number of tasks satisfied by each information element. Since the focus was on information relative to the total battlefield, it was assumed that all tasks were equally important under each resource. This assumption allowed the most important information elements to be identified based on their relative frequency os use. For example, if FLIRP information element #1 was essential to 4 tasks under Maneuver, 2 tasks under Fire Support, and 4 tasks under Deep Battle, it would have a value of 4 + 2 + 4 = 10. This coupled with the assumption that all tasks were equally important allowed the generation of a comparative value for each evaluated information element. In that this analysis was conducted independent of the type of operation or scenario, the results may vary for various types of operations by scenario. However, the objective of this study was not to identify all of the information which a commander needs, but a minimum set which should be available at all times.

RESULTS

Based on the analysis above, the following FLIRP information elements, not in priority order, are determined to be essential in support of any operation:

- Assets available (OPER by type).
- Command Mission.
- Constraints (by area or resources).
- Enemy situation assessment.
- Friendly activity (actions, time, units, loc).
- Priority of support to combat elements.
- Supply shortages (by class)
- Terrain (Approaches, Critical Concealment, Trafficability).

None of the FLIRP items were declared to be unnecessary, that is not required to support any of the resources.

In reviewing AirLand Battle Doctrine, the following elements of information were developed specifically as a basis for the development of plans and orders and are not contained in the FLIRP:

-- High Value targets : One that is feasible to attack and causes desirable enemy action. The objective of AirLand Battle doctrine is to allow a numerically inferior force to synchronize combat forces to defeat a superior force. High value targets provide windows of opportunity within which the inferior force commander can synchronize his forces and achieve the necessary combat power required to defeat a superior force.[32]

-- Area of Influence: An area where commanders locate and monitor enemy formations which can effect their current operations. Commanders will fight the enemy in the area of influence.[33]

-- Area of Interest: Areas extending beyond areas of influence which can effect a commander's operations in the near future. Within the area of interest, the commander must monitor enemy activity and determine its impact in future operations.[34]

All three information elements effect the development and execution of plans and orders. When

evaluated, they received a frequency of use equivalent to the essential FLIRP information elements. Therefore, all three are considered to be essential in support of any operation.

Conclusion

1. All 85 of the FLIRP elements appear necessary to support the commanders information requirements as dictated by AirLand Battle doctrine. However, those listed above were found to be the most frequently used and consequently are most in demand by the commanders. Some are more essential than others as demonstrated above.

2. Information on high value targets, area of influence, and area of interest is critical for the successful conduct of AirLand Battle doctrine. Based on this need and their frequency of use, they are essential for execution of the AirLand Battle doctrine.

ENDNOTES

1 U.S. Army, FC 100-15, CORPS OPERATIONS 1984: p. 7-2.

2 FM 100-5 (1982): p. 1-2.

3 C2SPR II (1984): p. 106.

4 FC 100-15 (1984): p. 3-18.

5 D.A. Ivanov, V.P. Sauel'yeu, and P.V. Shemansky, Fundamentals of Tactical Command and Control, 1977.

6 Ibid.

7 FM 100-5 (1982): p. 7-2.

8 Ibid., p. 7-3.

9 Ibid., p. 9-1.

10 Ibid., pp. 10-4, 5.

11 Ibid., p. 11-1.

12 Ibid., p. 5-8.

13 Ibid., p. 7-7.

14 Ibid., p. 2-7.

15 Ibid., p. 7-7.

16 Ibid., pp. 8-6, 7. All of these must be considered in relation to time, because the commander must also decide when he wants to concentrate.

17 Ibid.

18 Ibid.

19 Ibid., p. 7-10.

20 Ibid., p. 7-10, 13.

21 Ibid.

22 Ibid., pp. 7-13, 17.

23 Ibid.

24 FM 100-5 (1982): pp. 7-18, 19.

25 Ibid., p. 7-19.

26 Ibid.

27 Ibid., p. 7-20.

28 Ibid., p. 7-21.

29 Ibid.

30 Ibid.

31 Ibid., p. 9-18.

32 Army Master Plan (1983): p. 13.

33 FM 100-5 (1982): p. 7-15.

34 Ibid.

CHAPTER 4

A STAFF PERSPECTIVE

This chapter documents a survey of Section 3, of the 1984-1985 CGSC class at Ft Leavenworth, Kansas. The survey used the Commanders Critical Information Requirements (CCIR) worksheet found at Appendix B and used by the General Officers with results shown in Chapter 5. The major difference in the CGSC and General Officer surveys was that the General Officers looked at information required by them as commanders. The CGSC officers who completed the survey did so as staff officers charged with the responsibility of providing their commander with only critical information so as not to flood them with details.

The CGSC student survey answers came from three primary sources.

1. Experience as staff officers at the Division, Brigade, and Battalion level.
2. Corps and Division tactical training received as a part of the course curriculum at Ft Leavenworth.
3. Staff requirements experienced as a part of the Korean Exercise being conducted at the time the survey was conducted.

The purpose of the Korean Exercise was to formulate a Division operation order which countered a North Korean invasion of South Korea.

Survey participants were directed to evaluate the 24 information elements on the CCIR worksheet from a staff

officer's perspective and determine their value to the commander in the development and execution of an operation order. Justification for selection or non-selection of any or all of the CCIR's was to be annotated at the bottom of the form. They were also instructed to add any information elements which they felt were necessary and were not included in the 24.

The demographics of the officers involved in the survey are shown in TABLE 4-1.

TABLE 4-1

CGSC STUDENT RESPONDENT DEMOGRAPHICS

RANK (ARMY)

LTC	1
MAJ	34

SERVICE

ARMY	35
AIR FORCE	3
NAVY	1
ALLIED	5

		ARMY COMPONENT		
BRANCH OF THE ARMY	NUMBER	CA	CS	CSS
ADJUTANT GENERAL	1			X
AIR DEFENSE	3		X	
ARMOR	1	X		
ARTILLERY	5		X	
AVIATION (3 ATK HELO, 3 GENERAL)	6	X	X	
ENGINEER	1		X	
FINANCE	1			X
INFANTRY	5	X		
MEDICAL SERVICE	1			X
MILITARY INTELLIGENCE	2		X	
ORDNANCE	2			X
QUARTERMASTER	2			X
SIGNAL	2		X	
TRANSPORTATIONN	3			X
TOTAL	35	9	16	10
				64

Although there were three Air Force, one Navy and five allied officers, only those completed by Army officers were used in the analysis. The three Air Force officers and one Navy officer displayed a solid grasp of Army tactics, but lacked the indepth understanding of the Army necessary to properly evaluate the amount and type of information required by the commander as opposed to that available to him. The allied officers' surveys revealed a lack of understanding of U.S. Army tactics and an insufficient grasp of the English language necessary to fully understand the meaning of each of the 24 information elements.

Of the 35 respondents, 9 were in combat arms branches, 16 were in combat support branches, and the remaining 10 were in combat service support branches. This breakout will be analyzed later in this chapter to determine if differences existed between the responses provided by Combat Arms, Combat Support, and Combat Service Support personnel.[2]

Survey Results - General

Table 4-2 shows the frequency of selection of each of the 24 information elements by the 35 respondents. The mean frequency of response selection rate for the 24 information elements was 25.08 with a standard deviation of 7.05. The mean selection rate by respondent was 18.17 with a standard deviation of 4.57. These results differed from those of the General Officers who had a mean of 25.1 with a

TABLE 4-2

CCIR FREQUENCY OF SELECTION

	CCIR SURVEY ITEMS	FREQUENCY OF RESPONSE
1.	AREA OF OPERATIONSS	34
2.	ASSETS AVAILABLE	33
3.	COMMAND MISSION	33
4.	CONCEPT OF OPERATIONS	33
5.	AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	32
6.	COMMAND GUIDANCE	32
7.	INTELLIGENCE SUMMARY	32
8.	TASK ORGANIZATION	31
9.	ENEMY SITUATION (TIME/DISTANCE FACTOR)	30
10.	ADJACENT UNIT SITUATION	27
11.	ASSESSMENT	27
12.	KEY TERRAIN	27
13.	AXIS OF ADVANCE INFORMATION	26
14.	ENEMY MISSION	26
15.	RADIATION DOSE STATUS	23
16.	CRITICAL SITUATION ALERT	21
17.	FRIENDLY UNIT	21
18.	RELEASE POLICY (NUCLEAR)	21
19.	FRIENDLY ACTIVITY	20
20.	ENEMY WEAPONS SYSTEMS	18
21.	ENEMY AIRCRAFT	16
22.	BATTLEFIELD GEOMETRY	15
23.	TARGET CRITERIA	13
24.	COMMAND CONTROLLED ITEMS	11

standard deviation of 10.5. The larger mean and standard deviation of the General Officers is a result of the inclusion of additional information elements. The number of information elements selected by the General Officers had a range of 7 to 58 as opposed to a range of 10 to 24 for the CGSC officers. Reasons for the inclusion of additional information items by the General Officers as opposed to the CGSC students may be due to one or more of the following:

1. The General Officers were more familiar with the information elements and added additional requirements.
2. The General Officers felt they needed more information.
3. The CGSC students felt more inclined to evaluate these information elements provided as opposed to adding additional information elements.
4. As staff officers, the CGSC students felt obligated to limit the amount of information provided to the Commander.

STATISTICAL TESTING

In that the number of survey respondents (sample size) was only representative of the total CGSC class (population), it was necessary to conduct statistical testing to determine if there was a dependence between the type of responses and the population. A chi-squared test was used to make a comparison between the observed frequency of selection of a CCIR by a particular group and the total frequency of selection by all respondents, i.e., CA versus all of the student responses, CS versus all of the student responses and CSS versus all of the student responses. Two assumptions were made incident to this chi-squared test.

a. The sample is a simple random one from the population. This was accomplished by selection of CGSC survey participants without regard to branch or experience.

b. The sample size is reasonably large. The sample size was 36. This may not appear to be large yet the fact that 35 people responded indicates that the additional response would not have significantly affected the outcome. The high response rate helped to reduce the chance of a bias in the response and suggested that the sample was representative of the population as a whole. To determine if a bias existed, it was necessary to analyze the sample size.

The sample size was not statistically determined ahead of time. At the time the survey was initiated, it was determined that one out of 22 sections of CGSC students would provide a fair representation of the population as a whole. To determine if this sample size was in fact sufficient, an analysis was conducted to determine a confidence interval for this population size. This was achieved by taking the given sample size and developing a confidence interval. The following equation was used for this analysis:

$$n = \frac{[Z(1-x/2)]^2 \, p(1-p)}{h^2}$$

where: n = sample size
Z(1 - x/2) = is the standard normal value corresponding to the specified confidence coefficient
h = the half width of the confidence interval
p = proportion of staff officers with similar background who would have provided similar responses to the survey.

For the purpose of this analysis, it was assumed that because all CGSC students had received similar instruction in tactics and staff operations, that p would be relatively high. A value of p = .95 was used, which means that 95 percent of all CGSC officers have had the same amount of instruction in tactics and staff operations. Using a two-sided confidence interval of 95 percent, the value of n equaled 31. Since the sample size was 36, it can be inferred with a 95 percent level of confidence that of the population had similar training.

In conducting the chi-squared test, the null hypothesis was that the survey response is independent of the survey population. Using the equation: $\chi^2 = \sum_{n=1}^{k} \frac{(f_i - F_i)^2}{f_i}$

where:
X_2 = Chi-squared
fi = Observed frequency)the actual number of times a CCIR item was selected by each of the three components: e.g., CCIR #1 could have been selected 5 times by the CA, 7 times by the CS, and 3 times by the CSS. The values 5, 7, and 3 would then represent the observed frequency for CA, CS and CSS respectively).
Fi = Expected frequency (The average number of times that a CCIR is selected for all survey participants: e.g., for the above example the average would be (5+7+3)/3 which equals 5. therefore, F=5) In this analysis, i = 3.
i = the number of components.

The calculated chi-squared value for the three components (CA, CS, CSS) versus each CCIR element was 16.78183. This number was compared to the chi-squared table using 46 degrees of freedom. (degrees of freedom equals the number of CCIR items minus one times the number of components minus e.g., (24-1) (3-1) = 46). For 46 degrees of freedom, the smallest chi-squared value was 25.08. Since the calculated chi-square was less than 25.08 the inference is that there is insufficient evidence to conclude that there is a dependence between the CCIR element and survey respondent. Therefore, the CCIR selection rate among the three components should be relatively similar. This will be investigated in the next section, where the actual responses are evaluated and any differences explained.

Survey Results by Component -- Combat Arms (CA), Combat Support (CS) and Combat Service Support (CSS).

This section looks at the responses of the various branches by component to determine if there exists a difference in attitude among these three groups as to what is important to the Commander. Branches were analyzed by Component as shown in TABLE 4-1. TABLE 4-3 shows the frequency of selection for each of the 24 CCIR elements by Component.

To further investigate the value of each of the 24 CCIR elements, each one was categorized according to its selection rate by response by component: e.g., if all 10 combat arms respondents selected CCIR number 1, then its selection rate would be 100%; if 5 out of the 10 selected it, then the selection rate would be 50%. The categories developed corresponded to the following selection rates:

- Category 1 - CCIR element was selected by 100% of respondents.
- Category 2 - CCIR element was selected by 90-99% of the respondents.
- Category 3 - CCIR element was selected by 80-89% of the respondents.
- Category 4 - CCIR element was selected by 70-79% of the respondents.
- Category 5 - CCIR element was selected by 60-69% of the respondents.
- Category 6 - CCIR element was selected by less than 60% of the respondents.

TABLE 4-3

CCIR SURVEY ITEM	FREQUENCY OF RESPONSE CA (10) FREQ	%	CS (15) FREQ	%	CSS (10) FREQ	%
1. ADJACENT UNIT SITUATION	9	.9	14	.93	4	.4
2. AREA OF OPERATIONS	10	1.0	15	1.0	9	.9
3. ASSESSEMENT	7	.7	11	.73	9	.9
4. ASSETS AVAILABLE	10	1.0	14	.93	9	.9
5. AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	9	.9	14	.93	9	.9
6. AXIS OF ADVANCE INFORMATION	6	.6	13	.87	7	.7
7. BATTLEFIELD GEOMETRY	5	.5	8	.53	2	.2
8. COMMAND MISSION	10	1.0	14	.93	9	.9
9. COMMAND GUIDANCE	8	.8	14	.93	10	1.0
10. COMMAND CONTROLLED ITEMS	5	.5	3	.20	3	.3
11. CONCEPT OF OPERATIONS	10	1.0	14	.93	9	.9
12. CRITICAL SITUATION ALERT	4	.4	10	.67	7	.7
13. ENEMY AIRCRAFT	5	.5	9	.60	2	.2
14. ENEMY MISSION	9	.9	10	.67	7	.7
15. ENEMY SITUATION (TIME/DISTANCE FACTOR)	10	1.0	13	.87	7	.7
16. ENEMY WEAPONS SYSTEMS	7	.7	9	.60	2	.2
17. FRIENDLY ACTIVITY	6	.6	8	.53	6	.6
18. FRIENDLY UNIT	8	.8	9	.60	4	.4
19. INTELLIGENCE SUMMARY	8	.8	14	.93	10	1.0
20. KEY TERRAIN	8	.8	11	.73	9	.9
21. RADIATION DOSE STATUS	7	.7	10	.67	5	.5
22. RELEASE POLICY (NUCLEAR)	5	.5	9	.60	7	.7
23. TARGET CRITERIA	5	.5	6	.40	2	.2
24. TASK ORGANIZATION	10	1.0	12	.80	.8	.8

X^2 = 16.78; 46 df; p<.001

COMBAT ARMS

The distribution of CCIR items selected by the Combat Arms respondents are shown in TABLE 4-4.

TABLE 4-4

CCIR SELECTION RATE BY CA

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100%	2, 4, 8, 11, 15, 24
2	90-99%	1, 5, 14
3	80-89%	9, 18, 19, 20
4	70-79%	3, 16, 21
5	60-69%	6, 17
6	59% and below	7, 10, 12, 13, 22, 23

Of the 24 CCIR elements, 16 or 67% were selected as critical more than 70% of the time. Of those selected as critical less than 60% of the time, two involved information which can be readily displayed in a graphical format for the commander -- Axis of Advance Information (6), and Battlefield Geometry (7) -- and are not constantly required by the commander. Both are somewhat fixed and coincide with the mission and commanders concept of the operation.

Item number 10, Command Controlled Items, is a logistical report and can be maintained by the logisticians and be available on a query basis by the commander.

Item number 12, Critical Situation Alert, is similar to a spot report or situation report. These reports are provided constantly by subordinate units and constantly

change the force commanders report. Once the unit report is updated, based on the subordinate report, it can then be displayed as a graphical display and is easily available to the commander. If the situation warrants, the commander can query his staff to produce the details that went into establishing the unit situation report.

Item number 13, Enemy Aircraft, is normally tracked and maintained by the Air Force. Since the Force Commander cannot readily influence the allocation of counter-air assets nor change the Air Defense Alert status, this information is not critical to his immediate decision process.

Item number 17, Friendly Activites, much like items number 6, 7, and 12, can be graphically displayed and should be available on a query basis by the commander.

Items number 22, Release Policy (Nuclear), and number 23 (Target Criteria), are both related to the employment of nuclear weapons. These items of information would not be critical to the commander until release policy had been granted, at which time he finalizes the plans for their execution. Up until release has been granted, the staff will have the necessary nuclear release information required by the commander.

COMBAT SUPPORT

Distribution of number of items seleted by the Combat Support respondents are:

TABLE 4-5

CCIR SELECTION RATE BY CS

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100%	2
2	90-99%	1, 4, 5, 8, 9, 11, 19
3	80-89%	6, 15, 17, 24
4	70-79%	3, 20
5	60-69%	12, 13, 14, 16, 18, 21, 22
6	59% and below	7, 10, 23

The Combat Arms respondents recommended six 100% of the time. The Combat Support respondents only recommended one 100% of the time.

A chi-square of 7.97 with 23 degrees of freedom indicated that the results between the CA and CSS respondents were not significantly different. However, minor differences which did exist are analyzed and explained.

For the purpose of this analysis, only those information elements which differed by more than one category between components were investigated. Between the Combat Arms and Combat Support, the following major changes occurred:

TABLE 4-6

CA VS CS
CATEGORY

CCIR	CA	CS	CHANGE
6 (Axis of Advance)	5	3	+2
15 (Enemy Situation Time/Distance Factor)	1	3	-2
24 (Task Org)	1	3	-2
14 (Enemy Mission)	2	5	-3
18 (Friendly Unit)	3	5	-2

$x^2 = 7.97$; 23df; $p < .001$

From the Combat Arms to the CS only one CCIR increased in importance and four decreased. Those that decreased are all related to the mission and would seem as more important to a combat arms staff officer than to a combat support staff officer. The difference between the two components is, therefore, seen as resulting out of parochialism in that the combat arms officer is often responsible for the development of the maneuver portion of an operation plan which achieves the mission. Although the combat support staff officer also assists in the development of the maneuver portion of an operation plan, his major emphasis is in the development of his particular support annex. He is therefore more concerned with information oriented towards his particular area than the overall mission.

TABLE 4-7
CCIR SELECTION RATE BY CSS

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100%	9, 19
2	90-99%	2, 3, 4, 5, 8, 11, 20
3	80-89%	24
4	70-79%	6, 12, 14, 15, 22
5	60-69%	17
6	59% and below	1, 7, 10, 13, 16, 18, 21, 23

The comparison of CA versus CSS revealed a chi-square = 13.77 with 23 degrees of Freedom, and CS versus CSS revealed a chi-square = 11.82 with 23 degrees of freedom. Both of these results indicate that there was sufficient statistical evidence to discern that there is a difference between the CA and CS versus CSS. The reasons for these differences will be analyzed below.

When comparing the CA to the CSS, we find that 10 out of the 24 CCIR items differ by two or more categories:

TABLE 4-8

CA VERSUS CSS

CCIR	CATEGORY COMBAT ARMS	CS	CHANGE
3 (Assessment)	4	2	+2
9 (Command Guidance)	3	1	+2
12 (Critical Situation Alert)	6	4	+2

	CATEGORY		
CCIR	COMBAT ARMS	CS	CHANGE
14 (Enemy Mission)	2	4	-2
16 (Enemy Weapons Systems)	4	6	-2
18 (Friendly Unit)	3	6	-2
19 (Intelligence Summary)	3	1	+2
21 (Radiation Dose)	4	6	-2
22 (Release Policy)	6	4	+2
24 (Task Organization)	1	3	-2

X^2 = 13.77; 23df; p<.1

Of these 10, 5 increased in importance and 5 decreased in importance. Those that decreased in importance had to do with the current situation and the conduct of the battle. Those which increased in importance were primarily concerned with command guidance and longer term planning. These results support fully the missions of the two components in the battlefield. CA personnel are concerned initially with developing a plan or order and once the battle begins, that information which is critical to keeping the plan current. The CSS components, on the other hand, are constantly looking forward in time and are concerned with the planning and support required to conduct future operations. Therefore, their views on what information is critical will

be influenced by their perceived contribution to the overall battle and can be expected to be somewhat different.

The comparison between the CS versus CSS revealed that five out of the 24 CCIR items differed by two or more categories:

TABLE 4-9
CS VERSUS CSS

CCIR	CATEGORY CS	CSS	CHANGE
1 (Adjacent Unit Situation)	2	6	-4
3 (Assessment)	4	2	+2
16 (Enemy Weapon Syatems)	2	6	+4
17 (Friendly Activity)	3	5	-2
20 (Key Terrain)	4	2	-2

X^2 = 11.82; 23df; p<.05

Again the rationale for difference is the same as that between CA and CSS. However, it is interesting to note that of the five changes, two were reduced in importance by 4 categories. Both had to do with locations of units or weapon systems on the ground. This can be explained as a function of component mission. CS augments the combat power of the force commander by positioning assets in locations from which they can best influence the outcome of the battle. CSS provide support from areas which are most conducive to maintaining and supporting continuous and

efficient operations. Is therefore of more importance to the CS component to know his location relative to the battle, and the CSS component to know his location relative to the type support required.

In determining which CCIRs were critical, a weight was applied to each category corresponding to the category number: e.g., category 1 = 1, category 2 = 2...category 6 = 6. The same weighting factor was applied to all three components so that none would have an advantage. After applying the weighting factor, the values were summed across for each CCIR according to the following formula:

$$X = W_C + W_{CS} + W_{CSS}$$

WHERE: X = TOTAL WEIGHTED VALUE

W_C = WEIGHT FOR COMBAT ARMS

W_{CS} = WEIGHT FOR COMBAT SUPPORT

W_{CSS} = WEIGHT FOR COMBAT SERVICE SUPPORT

The maximum score which a CCIR could receive was 18 (Category 6 for all three components) and the minimum score was 3 (Category 1 for all three components). A score of 3-7 was considered as critical. Seven was selected as the upper boundary because any value larger than 7 would allow a CCIR to be considered as critical when it was in fact selected as a category 5 (60-69%) by at least one of the components. A score of 8-14 indicated that the CCIR was necessary but not critical. A score of 15-18 indicated that the CCIR is not necessary. TABLE 4-10 shows the values produced by the weighting process.

TABLE 4-10
WEIGHTING APPLICATION

	CCIR SURVEY ITEM	CATEGORY: COMBAT ARMS	CS	CSS
1.	ADJACENT UNIT SITUATION	2	2	6
2.	AREA OF OPERATIONS	1	1	2
3.	ASSESSMENT	4	4	2
4.	ASSETS AVAILABLE	1	2	2
5.	AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	2	2	2
6.	AXIS OF ADVANCE INFORMATION	5	3	4
7.	BATTLEFIELD GEOMETRY	6	6	6
8.	COMMAND MISSION	1	2	2
9.	COMMAND GUIDANCE	3	2	1
10.	COMMAND CONTROLLED ITEMS	6	6	6
11.	CONCEPT OF OPERATIONS	1	2	2
12.	CRITICAL SITUATION ALERT	6	5	4
13.	ENEMY AIRCRAFT	6	5	6
14.	ENEMY MISSION	2	5	4
15.	ENEMY SITUATION (TIME/DISTANCE FACTOR)	1	3	4
16.	ENEMY WEAPONS SYSTEMS	4	2	6
17.	FRIENDLY ACTIVITY	5	3	5
18.	FRIENDLY UNIT	3	5	6
19.	INTELLIGENCE SUMMARY	3	2	1
20.	KEY TERRAIN	3	4	2
21.	RADIATION DOSE STATUS	4	5	6
22.	RELEASE POLICY (NUCLEAR)	6	5	4
23.	TARGET CRITERIA	6	6	6
24.	TASK ORGANIZATION	1	3	3

Results of Analysis

Of the 24 CCIR evaluated, eight were determined to be critical to the commander and seven were determined as not necessary (see TABLE 4-11). The scoring parameters could have been altered. If the not necessary range were increased by one from 15-18 to 14-18, only one additional item would been determined as not necessary. However, if the range had been decreased by one, from 15-18 to 16-18, then three of the seven CCIR determined to be not needed could have been eliminated. However, the author feels that the analysis is valid and the ranges are appropriate.

TABLE 4-11

	CCIR SURVEY ITEM	WEIGHTED VALUE	
1.	ADJACENT UNIT SITUATION	10	
2.	AREA OF OPERATIONS	4	CRITICAL
3.	ASSESSMENT	10	
4.	ASSETS AVAILABLE	5	CRITICAL
5.	AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	6	CRITICAL
6.	AXIS OF ADVANCE INFORMATION	12	
7.	BATTLEFIELD GEOMETRY	18	NOT NEEDED
8.	COMMAND MISSION	5	CRITICAL
9.	COMMAND GUIDANCE	6	CRITICAL
10.	COMMAND CONTROLLED ITEMS	18	NOT NEEDED
11.	CONCEPT OF OPERATIONS	5	CRITICAL
12.	CRITICAL SITUATION ALERT	15	NOT NEEDED
13.	ENEMY AIRCRAFT	17	NOT NEEDED
14.	ENEMY MISSION	11	
15.	ENEMY SITUATION (TIME/DISTANCE FACTOR)	8	
16.	ENEMY WEAPONS SYSTEMS	12	
17.	FRIENDLY ACTIVITY	13	
18.	FRIENDLY UNIT	14	
19.	INTELLIGENCE SUMMARY	6	CRITICAL
20.	KEY TERRAIN	9	
21.	RADIATION DOSE STATUS	15	NOT NEEDED
22.	RELEASE POLICY (NUCLEAR)	15	NOT NEEDED
23.	TARGET CRITERIA	18	NOT NEEDED
24.	TASK ORGANIZATION	7	CRITICAL

ENDNOTES

[1] U.S. Army, FM 101-5-1, Operational Terms and Graphics (1980): p. 126.

[2] In the context of this study, Combat Arms (CA) applies to combat maneuver forces which use fire and movement to engage the enemy with direct fire weapons (Armor, Infantry, Aviation (attack helicopter)).

Combat Support (CS) applies to those elements which provide fire support and operational assistance to combat elements. (Artillery, Air Defense, Aviation (less Attack Helicopter), Engineer, Signal, and Electronic Warfare).

Combat Service Support (CSS) applies to those elements which provide administrative and logistic support to sustain combat forces. (Adjutant General, Finance, Medical Service, Ordnance, Quartermaster, and Transportation).

CHAPTER 5

A COMMANDER'S PERSPECTIVE

This chapter in contrast to Chapter 4 looks at information from the commander's perspective. The basis of this chapter is the CCIR Survey sheet used by the CGSC students in Chapter 4. In September 1984, it was sent out to 28 general officers who were currently serving as a Corps or Division Commander, or Commandant of a TRADOC school and center. Twenty five out of the 28 general officers completed the surveys. A list of the respondents is at Appendix C.

Conduct of the Survey

The survey was sent out by the Combined Arms Combat Development Activity in early September 1984. The purpose of the survey was to query commanders, at the direction of the Vice Chief of Staff of the Army in an attempt to identify the minimum essential information requirements which a commander needs for his decision-making process. The results of the survey are to serve as a basis for development of automated decision aids to assist the field commander in his decision making process.[1] A copy of the survey is at Appendix B. The survey was followed up by a workshop in December 1984, to evaluate the results of

the survey. Four current Division Commanders and MG Wishart, CACDA, attended the workshop. The results of the workshop were not critical to this study and therefore were not included. Workshop results can be found in a report titled "Division Commanders Critical Information Requirements (CCIR)," published by the Combined Arms Center, Ft Leavenworth.

Demographics of Respondents

TABLE 5-1 shows the distribution of respondents by location and assignment. Of the 25 respondents, eight were OCONUS and 17 were CONUS. Six out of the 25 were School Commandants, 15 were Division Commanders, and 4 were Corps Commanders. The survey response rate of 89% suggests that the results of the survey are representative of the group as a whole.[2]

TABLE 5-1

CCIR SURVEY RESPONDENTS[3]

ASSIGNMENTS	LOCATION		
	CONUS	OCONUS	TOTALS
SCHOOL COMMANDANTS	6	0	6
DIVISION COMMANDERS	9	6	15
CORPS COMMANDERS	2	2	4
TOTALS	17	8	25

Survey Results

There were two differences between the responses of General Officers and the CGSC students. The first difference was that the former elected to add additional items which they felt were critical in addition to the 24 presented for evaluation. The CGSC respondents as a whole, added no additional critical items and further felt a need to reduce the number selected as critical as shown in Chapter 4.

The second difference evaluated was the statistical difference between the frequency of response of the 24 CCIR elements among the two survey groups.

A chi-square test between the General Officers and CGSC students produced a chi-square of 59.17 with 23 degrees of freedom. This indicates that there was sufficient statistical evidence to discern that a significant difference between the General Officer and the CGSC respondents exists. This corresponds to the difference in direction given to each group in determining their respective response -- General Officers conducted theirs from a Commanders point of view; the CGSC students conducted theirs from a staff officers perspective. This difference adds statistical credit to the findings of this study.

Within the General Officer, a second chi-square test was conducted to determine if there was sufficient reason to suspect that a difference between the Div CGs, Corps CGs,

and School Commandants existed. The result of this investigation revealed a chi-square of 28.58 with 46 degrees of freedom. This implies that there is sufficient statistical evidence to discern that a difference between the three groups of General Officers exists. Therefore, we can expect to find a dependence between each General Officer group and their responses. This dependence will be further investigated and explained.

The average number of critical items selected by the General Officers differed according to assignment as shown in TABLE 5-2. The division commanders had the most consistent results with a mean of 24.6 items selected with a standard deviation of 6.5. They were followed by the Corps Commanders with a mean of 22.2 and standard deviation of 13.0 and the School Commandants with a means of 28.2 and standard deviation of 16.7. The differences in scores may be reflective of the level of command and familiarity with doctrine and the changes therein. The School Commandants, often being close to changes in doctrine, tended to be more divergent in their responses, whereas, field commanders, who must apply the doctrine, saw the need for a more limited set of information in a more constrained environment. This suggests a greater focusing of information for decision making by Commanders than by School Commandants.

TABLE 5-2.

NUMBER OF ITEMS IDENTIFIED AS CRITICAL

ASSIGNMENT	NUMBER	MEAN	SD	RANGE
SCHOOL COMMANDANTS	6	28.2	16.7	7.58
DIVISION COMMANDERS	14	24.6	6.5	10.38
CORPS COMMANDERS	4	22.2	13.0	16.45

TABLE 5-4 shows the frequency of selection of the CCIR information items. All except for #13 (enemy aircraft) and #20 (key terrain) were selected by at least 60% of the School Commandants. TABLE 5-3 shows the frequency of selection by the School Commandants.

TABLE 5-3

CCIR SELECTION RATE BY SCHOOL COMMANDANTS

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100%	5, 8, 11, 24
2	90-99%	0
3	80-89%	1, 2, 3, 4, 6, 7, 9, 10, 12, 15, 16, 19, 21
4	70-79%	0
5	60-69%	14, 17, 18, 22, 23
6	50-59%	13, 20

TABLE 5-4
FREQUENCY OF CCIR SELECTED

	SCHOOL COMMANDANTS	DIVISION COMMANDERS	CORPS COMMANDERS
1. ADJACENT UNIT SITUATION	.83	.93	1.00
2. AREA OF OPERATIONS	.83	.79	.50
3. ASSESSEMENT	.83	.50	.50
4. ASSETS AVAILABLE	1.00	.93	1.00
5. AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	1.00	.79	.75
6. AXIS OF ADVANCE INFORMATION	.83	.57	.50
7. BATTLEFIELD GEOMETRY	.83	.79	1.00
8. COMMAND MISSION	1.00	.93	1.00
9. COMMAND GUIDANCE	.83	.93	1.00
10. COMMAND CONTROLLED ITEMS	.83	.64	.75
11. CONCEPT OF OPERATIONS	1.00	.93	.75
12. CRITICAL SITUATION ALERT	.83	.71	.50
13. ENEMY AIRCRAFT	.17	.29	.25
14. ENEMY MISSION	.67	.71	1.00
15. ENEMY SITUATION (TIME/DISTANCE FACTOR)	.83	.86	1.00
16. ENEMY WEAPONS SYSTEMS	.83	.71	.25
17. FRIENDLY ACTIVITY	.67	.79	1.00
18. FRIENDLY UNIT	.67	.79	1.00
19. INTELLIGENCE SUMMARY	.83	.86	.50
20. KEY TERRAIN	.17	.43	.25
21. RADIATION DOSE STATUS	.83	.64	.50
22. RELEASE POLICY (NUCLEAR)	.67	.79	.50
23. TARGET CRITERIA	.67	.57	.50
24. TASK ORGANIZATION	1.00	.93	.75

X^2 = 28.58; 46df; p<.025

Table 5-5 shows the frequency of selection for division commanders.

TABLE 5-5

CCIR SELECTION RATE BY DIVISION COMMANDERS

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100	0
2	90-99%	1, 4, 8, 9, 11, 24
3	80-89%	15, 19
4	70-79%	2, 5, 7, 12, 14, 16, 17, 18, 22
5	60-69%	10, 21
6	59% and below	3, 6, 13, 20, 23

The Division Commanders rated none in category 1, and 5 in category 5. Their results were quite similar to those of the School Commandants except for #3, which they rated in category 6 as opposed to category 3 by the School Commandants. This may be caused by the importance which doctrine places on assessment of the enemy's capabilities as opposed to what is actually available in the field.

The selection rate for the Corps Commander is at Table 5-6. Since there were only four Corps Commanders participating, the frequency of selection is greatly skewed to those categories containing a multiple of 25 -- 1, 4, 6.

TABLE 5-6

CCIR SELECTION RATE BY CORPS COMMANDERS

CATEGORY	SELECTION RATE	CCIR ITEMS
1	100%	1, 4, 7, 8, 9, 14, 15, 17, 18
2	90-99%	0
3	80-89%	0
4	70-79%	5, 10, 11, 24
5	60-69%	0
6	59 and below	2, 3, 6, 12, 13, 16, 19, 20, 21, 22, 23

Because of this skewing, it is difficult to compare the Corps Commander's results to those of the School Commandants and Division Commanders. However, it is sufficient to say that the general position within the scale -- top, middle, low -- for the majority of CCIR elements did not change considerably. This result helps to solidify the importance of some CCIR elements, -- 5, 8, 9 -- over others -- 13, 20, 23. This result also adds validity to those CCIR elements selected as critical to the commander's decision-making process.

Critical CCIR elements

As in Chapter 4, the CCIR elements were weighted by respondant and grouped according to category:

CATEGORY	WEIGHT APPLIED
1	1
2	2
3	3
4	4
5	5
6	6

Using the equation:

$$W_{TOTAL} = W_c + W_{dc} + W_{cc}$$

the following items are determined to be critical to the Commander decision-making process. Composite Weight scores are on table 5-7.

CLASS	WT	CCIR
CRITICAL	0-7	1, 4, 7, 8, 11, 15, 24
NECESSARY	8-14	2, 5, 7, 10, 12, 14, 16, 17, 18, 19, 21
NOT NEEDED	15-18	3, 6, 13, 20, 22, 23

Using the same scoring method, none of the additional Force Level Information Requirements elements which were hand written in by the respondents, received a high enough score to rate even as necessary. However, one item -- Enemy Activity (Location, Time, Type), was submitted by 57% of the respondents.[6] Two items -- Available Supply Rate and Weather Data -- were recommended by 43% of the respondents.[7] And, three items -- Order of Battle,

TABLE 5-7
COMPOSITE WEIGHT OF CCIR

	CCIR SURVEY ITEM	(W_C) WEIGHT COMMANDANT	(W_{DC}) WEIGHT DIV CDR	(W_{CC}) WEIGHT CORPS CDR	W_T
1.	ADJACENT UNIT SITUATION	3	2	1	6
2.	AREA OF OPERATIONS	3	4	6	13
3.	ASSESSEMENT	3	6	6	15
4.	ASSETS AVAILABLE	3	2	1	6
5.	AVENUES OF APPROACH (TIME/DISTANCE FACTOR)	1	4	4	9
6.	AXIS OF ADVANCE INFORMATION	3	6	6	15
7.	BATTLEFIELD GEOMETRY	3	4	1	8
8.	COMMAND MISSION	1	2	1	4
9.	COMMAND GUIDANCE	3	2	1	6
10.	COMMAND CONTROLLED ITEMS	3	5	4	12
11.	CONCEPT OF OPERATIONS	1	2	4	7
12.	CRITICAL SITUATION ALERT	3	4	6	13
13.	ENEMY AIRCRAFT	6	6	6	18
14.	ENEMY MISSION	5	4	1	10
15.	ENEMY SITUATION (TIME/DISTANCE FACTOR)	3	3	1	7
16.	ENEMY WEAPONS SYSTEMS	3	4	6	13
17.	FRIENDLY ACTIVITY	5	4	1	10
18.	FRIENDLY UNIT	5	4	1	10
19.	INTELLIGENCE SUMMARY	3	3	6	12
20.	KEY TERRAIN	6	6	6	18
21.	RADIATION DOSE STATUS	3	5	6	14
22.	RELEASE POLICY (NUCLEAR)	5	4	6	15
23.	TARGET CRITERIA	5	6	6	17
24.	TASK ORGANIZATION	1	2	4	7

Situation Report, and Battle Loses (equipment) -- were recommended by 33% of the respondents.[8] All six of these items are candidates for further analysis as to their criticality to the commander's decision-making process. However, in that none of them received a weighted score of 14 or lower, they are not considered within the methodology of this paper to be necessary to the commander's decision-making process.

CONCLUSIONS

There is a list of minimum information needs which most commanders feel are needed in the decision process. The major information elements required as identified in TABLE 5-7 are:

Critical

1. Adjacent Unit Situation
4. Assets Available
8. Command Mission
9. Command Guidance
11. Concept of Operations
15. Enemy Situation
24. Task Organization

ENDNOTES

[1] Ridel, S.L., "Commanders Critical Information Requirements Survey" (1984), p. 1.

[2] Ridel, p. 2.

[3] Ridel, p. 2.

[4] Ridel, p. 4.

[5] The factor that the range exceeds the upper bound of 24 is attributable to the fact that the general officers had a tendency to add items they felt were critical.

[6] Ridel, p. 7.

[7] Ridel, p. 7.

[8] Ridel, p. 7.

CHAPTER 6

This chapter summarizes all information elements determined to be critical in Chapters 3, 4, and 5, and compares them to determine if any patterns exist. Table 6-1 shows this comparison. To simplify the table and accent the critical CCIR information elements as opposed to those not needed, the following convention was used:

YES - indicates the CCIR item is critical (Determined as necessary by the commander to execute AirLand Battle Doctrine)

NO - indicates the CCIR items is not needed (Items which are not constantly required by the commander in the exeuction of AirLand Battle Doctrine)

BLANK - indicates information elements where insufficient evidence existed to rate them as a YES or NO.

ANALYSIS

CCIR item #8, Command Mission, was the only CCIR item considered critical by the doctrinal review and both of the surveys. This is readily understood because all planning, both offensive and defensive, begins with a mission statement. The mission statement constitutes paragraph #1 of the staff estimates and paragraph #2 of both OPLANS and OPORDS. From the mission statement, tasks, which

TABLE 6-1
CRITICAL INFORMATION COMPARISON

CCIR SURVEY ITEMS	CHAPTER 3 DOCTRINAL SEARCH	CHAPTER 4 CGSC SURVEY	CHAPTER 5 GO SURVEY
1. ADJACENT UNIT SITUATION			YES
2. AREA OF OPERATIONS		YES	
3. ASSESSEMENT	YES		
4. ASSETS AVAILABLE		YES	YES
5. AVENUES OF APPROACH (TIME/DISTANCE FACTOR)		YES	
6. AXIS OF ADVANCE INFORMATION			NO
7. BATTLEFIELD GEOMETRY		NO	
8. COMMAND MISSION	YES	YES	YES
9. COMMAND GUIDANCE		YES	YES
10. COMMAND CONTROLLED ITEMS		NO	
11. CONCEPT OF OPERATIONS		YES	YES
12. CRITICAL SITUATION ALERT		NO	
13. ENEMY AIRCRAFT		NO	NO
14. ENEMY MISSION			
15. ENEMY SITUATION (TIME/DISTANCE FACTOR)	YES		YES
16. ENEMY WEAPONS SYSTEMS			
17. FRIENDLY ACTIVITY	YES		
18. FRIENDLY UNIT			
19. INTELLIGENCE SUMMARY		YES	
20. KEY TERRAIN			NO
21. RADIATION DOSE STATUS		NO	
22. RELEASE POLICY (NUCLEAR)		NO	NO
23. TARGET CRITERIA		NO	NO
24. TASK ORGANIZATION		YES	YES

are essential to the overall success of the mission, are identified.[1] A commander's assets are oriented directly to accomplishing these tasks. It is in support of the planning and directing of these assets that all other information is developed. Therefore, Command Mission is determined to be the most critical command information element.

CCIR items #4 (Assets Available), #9 (Command Guidance), #11 (Concept of the Operations), and #24 (Task Organization), were determined to be critical by both the General Officer and CGSC survey. On close inspection, we can see that #11 and #24 are distinct parts of the operation order, which in itself highlights their importance. Number 9, Command Guidance, is somewhat related to #8, Command Mission. It plays an ever increasing role in AirLand Battle doctrine, where it will be necessary to fully understand the command mission in order to plan battles in an area of interest and conduct three simultaneous battles, deep, close-in, and rear in the area of influence.[2] CCIR item #4 is critical to any planning operation, and is not limited to just tactical operations. The logistical base is constantly updating and providing the commander with information on the status of available personnel and equipment. Without an accurate knowledge of available assets, a commander cannot wargame courses of action and develop a sound tactical plan[3].

CCIR item #15 (Enemy Situation) was determined to be critical by the doctrinal review and the General Officer Survey. Again this is a major paragraph in the OPLAN and OPORD which speaks for its importance. On close inspection, one can see that of the 6 CCIR items, so far identified as critical 4-- #8 (Mission Statement), #11 (Concept of the Operation), #15 (Enemy Situation), and # 4 (Task Organization) are major parts of the operation plan and operation order.[4] Therefore, there should be little question as to their importance to the commander's decision process. The remaining two, #4 (Assets available) and #9 (Command guidance) tell what the commander has to work with and the general guidance as to how he should employ these assets so as to coincide with the overall battle plan. Therefore, they are both essential to the planning process.

The following CCIR items were considered to be necessary but not as critical as those already discussed:

#1. Adjacent Unit Situation - Soviet doctrine is to attack weak points or gaps and maneuver against our flank and rear.[5] Natural gaps or weak points occur at unit boundaries. With the dynamic nature of AirLand Battle doctrine, where units are rapidly moved both laterally and in depth across the entire sector, it is therefore necessary that a commander constantly know the situation on his flanks and rear to protect against a possible enemy attack.

#3 Assessment (EW & OPSEC). Soviet doctrine directs that Electronic Warfare be integral to all combat operations.[6] Their ability to disrupt communications and restrict command and control can significantly degrade combat power. This item was identified in the doctrinal review and was not considered esential via either of the surveys. Although it is important to the planning process, it may better support the decision process by being available to the commander in a query rather than a direct basis.

#5 Axis of Approach. This is important in the development of courses of action and is usually identified by the G-2 when developing the intelligence estimate.[7] Again, this may best serve the decision process by being available in a query basis or perhaps as a graphical portrayal on a map.

#17. Friendly Activity - This is needed by the commander when accessing the impact that planned operations will have on the disposition of his fires on the battlefield. Like the previous one, this may best be presented to the commanders in a graphical format.

#19. Intelligence Summary - This is maintained by the G-2 and changes constantly based on intelligence and collection means. The commander should routinely need an appraisal of only those updates which will affect his current or planned operations.

In addition to the 24 CCIR items, seven others were determined as necessary based on the doctrinal review. Of these seven, four are already contained in the Force Level Information Requirements Plan (FLIRP) and three others resulted as a direct result of AirLand Battle doctrine. The four already contained in the FLIRP are:

#32 Constraints.

#63 Priority of support to combat elements.

#78 Supply Shortages.

#82 Terrain (Approaches, Critical Concealment, Trafficability).

One can look at all four of these and see their relation to logistics. Information on each of these is necesary for determining combat ratios used in developing a Course of Action. They are not needed by the commander on a constant basis, but should be available on an immediate query basis.

The remaining three elements of information are not FLIRP items are resulted from the doctrine review conducted in Chapter 3. They are:

High Value Targets - one that is feasible to attack and causes desirable enemy action.[8]

Area of Influence - an area where commanders locate and monitor enemy formations which can effect their current operations.[9]

Area of Interest - Areas extending beyond areas of influence which can effect a commanders operations in the near future.[10] Areas of Influence and interest are necessary because they contain forces which help decide the direction of current and future plans and operations.[11] High value targets dictate the creation of windows of opportunity through which commanders synchronize their combat forces in order to achieve a favorable combat ratio.

CONCLUSION

The elements of information shown in TABLE 6-2, were found to be necessary to the successful execution of AirLand Battle Doctrine.

TABLE 6-2
RECOMMENDED CRITICAL INFORMATION ITEMS

CCIR	ITEM # FLIRP	TITLE	REQUIREMENT STATUS
8	27	Command Mission	Most Critical
4	14	Assets Available	Critical
9	28	Command Guidance	Critical
11	30	Concept of the Operation	Critical
24	81	Task-Organization	Critical
1	3	Adjacent Unit Situation	Necessary
3	13	Assessment	Necessary
5	17	Avenues of Approach	Necessary
17	47	Friendly Activity	Necessary
19	51	Intelligence Survey	Necessary
-	32	Constraints	Necessary
-	63	Priority of Support to Combat Elements	Necessary
-	78	Supply Shortages by Class	Necessary
-	82	Terrain (Approaches, Critical Concealment, Trafficability)	Necessary
-	-	High Value Targets	Necessary
-	-	Area of Interest	Necessary
-	-	Area of Influence	Necessary

ENDNOTES

1 U.S. Army, FM 101-5, Staff Organizations and Operations (1984): p. 5-8.

2 FC 100-9 (April 1984): pp. 2-6, 7.

3 Ibid., p. 4-17.

4 FM 101-5 (1984): p. 14.

5 U.S. ARMY, FM 100-2-1, The Soviet Army: Operations and Tactics, (1984): p. 5-13.

6 Ibid., p. 15-1.

7 FC 100-9 (April 1984): Chapter 3.

8 Army Master Plan (1983): p. 13.

9 FM 100-5 (1982): P. 6-2.

10 Ibid.

11 Ibid., p. 6-1.

CHAPTER 7

CONCLUSIONS

The purpose of this study was to critically examine information required by the Force Commander and determine if a minimal subset exists which has application for the conduct of AirLand Battle doctrine. The findings indicate there is strong evidence to support the identification of a condensed set of information which should be constantly available to the commander. This information is primarily oriented on the mission, the nature of the threat, and available assets.

A synergistic result of this study was the identification of a difference in attitude among the various army components and among the different groups of general officers as to what information is required for the prosecution of battle. Within the total CGSC population, there was no significant dependence between any of the three surveyed components and the CCIR items. However, when analyzed separately, there was sufficient evidence to infer that perceptions as to which CCIR items were necessary differed significantly between the Combat Service Support (CSS) and the Combat Arms (CA)/Combat Support (CS) components. The CSS respondents displayed a need for information on which long term planning is dependent. The

CA and CS respondents indicated a need for information more critical to the actual conduct of the battle itself.

A similar result surfaced from the analysis of the general officer respondents. The difference here was significant between the School Commandants and the Division and Corps Commanders. The School Commandants tended towards a larger set of critical information than did the Division and Corps Commanders. This difference can be best explained as a function of the use of this information. The School Commandants, as proponents for doctrine and, in some cases, combat development, are intimately familiar with their respective areas and can see a justifiable need for more information. The Division and Corps Commanders, as users of information, cannot afford to get flooded with less critical information. They are more prone to want only that information which they can immediately use in the development of a plan or in the actual conduct of the battle. Therefore, their information needs are reduced and focused on operational as opposed to logistical type information.

The last, and probably the most expected finding, was that a significant difference exists between the CGSC student and general officer respondents. The CGSC respondents, acting as staff officers, indicated a need to provide the commander a very limited set of information on a continuing basis. This reinforces the notion that staff

officers feel the need to protect the commander from being inundated with information so that he can focus on the conduct of the battle. This notion is extremely important and will be greatly accented with the introduction onto the modern battlefield of automation for the collection, processing and transmitting of information. With the speed and power of automation, a commander could readily be so immersed in details that he does not have sufficient time to devote to the prosecution of the battle.

Areas for Future Study

This study, focused only on identifying information which is critical to the force commander's decision-making process. The results at TABLE 6-2, Chapter 6, represent the major findings of this study. The author recognizes that these figures do not represent the total set of critical information required by all commanders in all types of tactical situations. Rather, they represent a minimum critical set of information which should be provided to a commander from which additional information elements can be generated or to which others may be added. To this end, the author recommends the following areas for further study.
1. A detailed study of the U.S. vs Soviet decision-making process to determine if it is in fact possible for the US commander to collect, process, and use information to cause the enemy to react to our plans (proactive), before the

enemy causes us to react to this plans (reactive). This should be investigated from the perspective of how well automated generated information utilizing varying degrees and amount of information can assist in this process. 2. A detailed study on battlefield decisions. A major shortcoming identified within the context of this study was the fact that no major studies have been conducted on tactical battlefield decisions. In Chapter 2, this author tied battlefield command and control tasks to information. However, the connection between this information and command decisions was beyond the scope of this study and could not be made. To develop a set of information critical to combat, one must first understand what decisions are made, the tasks which support these decisions, and the information to support these tasks. This paper tied information to tasks, and also made the connection between information and the control of assets. A study aimed at identifying and categorizing battlefield decisions would allow the gap between tasks, assets, and command decisions to be bridged and further support the development of an automated Command and Control system.

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APPENDICES

APPENDIX A. COMMANDERS CRITICAL INFORMATION NEEDS

The following represent the Commanders 83 key information elements as found in the Force Level Information Requirements Plan (FLIRP). A short definition of each information element can be found in Annex A to this appendix.

001 A/C ALLOCATIONS/PRIORITIES
002 A/C REQUIREMENTS
*003 ADJACENT UNIT SITUATION
004 ADM (NUMBER, TYPE LOC)
005 AIR DEFENSE SUPPRESSION REQUIREMENT (SEAD)
006 AIRCRAFT REPORT (FRIENDLY)
007 AIRFIELDS (LOC, TYPE, CONDITION)
008 AIRHEAD LOCATION
009 AIRSPACE COORDINATION AREA
010 AIRSPACE RESTRICTIONS
*011 AREA OF OPERATIONS
012 ASSEMBLY AREA LOCATION
*013 ASSESSMENT (EW & OPSEC)
*014 ASSETS AVAILABLE (OPERABLE BY TYPE)
015 ARTILLERY TARGET REPORT
016 AVAILABLE SUPPLY RATE (RDS BY TYPE)
*017 AVENUES OF APPROACH (DESCRIPTION OF EACH)
*018 AXIS OF ADVANCE (DESCRIPTION)
019 BASIC LOAD PERCENT FILL (BY TYPE)
020 BATTLE LOSSES (EQUIP)
*021 BATTLEFIELD GEOMETRY (BOUNDARIES)
022 BOMB DAMAGE ASSESSMENT
023 BRIDGES/FORDING SITES
023 BRIDGING (LOC, TYPE, CONDITION)
024 CALL FOR FIRE
025 CASUALTY REPORT
026 CHECK FIRE
*027 CMD MSN
*028 CMD/G2 GUIDANCE (EEI)
*029 COMMAND CONTROLLED ITEMS
*030 CONCEPT (SCHEME OF MANEUVER)
031 CONOPS (MAIN, TAC, REAR)
032 CONSTRAINTS (BY AREA OR RESOURCES)
033 COORDINATING INSTRUCTIONS
034 CRITICAL PERSONNEL SHORTAGES BY MOS
*035 CRITICAL SITUATION ALERT
*036 CRITICAL (KEY) TERRAIN (LOC/DESCRIPTION)
037 ECM.ECCM REPORT
038 EEFI FRIENDLY VULNERABILITIES (UNIT, EQUIPMENT, OPR)
*039 EN ACTIVITY (LOC, TIME, TYPE)

*040 EN AIRCRAFT
*041 EN MSN/OBJECTIVE
*042 EN SITUATION/ASSESSMENT
*043 ENEMY WEAPON SYSTEMS
044 ENGR SPT REQUIRED (LOC, TYPE SPT AND EQUIPMENT)
045 EW TASKING
046 FREE TEXT
*047 FRIENDLY ACTIVITY (ACTIONS, TIME, UNIT, LOC)
*048 FRIENDLY UNIT INFORMATION
049 GRAPHIC MESSAGE
050 IMMEDIATE ENGAGEMENT TARGET
*051 INTELLIGENCE SUMMARY
052 INTERFERENCE
053 MINEFIELDS (LOCA, TYPE, # MINES)
054 MISSION FIRED REPORT
055 MOVEMENT TABLE LISTING
056 NBC REPORT
057 OBSTACLES/BARRIERS
058 ORDER OF BATTLE
059 PLANNED TARGET
060 POL LOCATIONS
061 PRIORITIES FOR ADA
062 PRIORITY OF ISSUE
063 PRIORITY OF SUPPORT TO COMBAT ELEMENTS
064 QUERY AND SRI
*065 RADIATION DOSE STATUS (DOSE READINGS BY LOC & ACTV)
066 RAILWAYS
*067 RELEASE POLICY (AUTH FOR RELEASE AND RQMTS) (NUCS)
068 REPLACEMENT PRIORITIES (UNIT, INDIVIDUAL)
069 REPORT REQUEST
070 REQUIRED SUPPLY RATE (RDS BY TYPE)
071 ROADS (LOC, TYPE, CONDITION)
072 ROUTES (CONDITIONS, AVAILABILITY)
073 SERIOUS INCIDENTS (DATE, TIME, LOC, EVENT)
074 SITUATION REPORT (SITREP)
075 SORTIES (#, TYPE)
076 SPECIAL OPNS (COUNTERSURV, SUBVER, SABOTAGE)
077 STRIKE WARNING
078 SUPPLY SHORTAGES (BY CLASS)
*079 TARGET CRITERIA
080 TARGET REQUEST
*081 TASK ORGANIZATION
082 TERRAIN (APPROACHES, CRITICAL CONCEALMENT, TRAFFICABILITY)
083 WEATHER DATA

* COMMANDERS CRITICAL INFORMATION REQUIREMENTS (CCIR)

ANNEX 1 TO APPENDIX A. INFORMATION REQUIREMENTS
ANNEX I

The information items listed in this appendix were extracted verbatim from the Operational and Organizational (O&O) plan for the Maneuver Control System,[1] and represent the total information requirements of the force commander.

INFORMATION EXCHANGE REQUIREMENTS

Airspace Coordination Area. Provides for the establishment of Air Space Coordination Area in the support of reconnaissance, close air support mission.

Aircraft Allocations/Priorities. An allocation is a refinement of the apportionment decision made by the Force Commander. It defines the total tactical air capability among air strike tasks to be performed for a specified period. Priorities involves the ranking by a commander of a number of elements of any situation in the order of each elements' importance to the accomplishment of the mission.

Aircraft Requirements. An activity requiring aircraft support expresses that requirement with this category of information. The requirement for support also defines the type of functional support requests, i.e., counterair, close air support, air interdiction, tactical air reconnaissance, tactical airlift operations (including air evacuation), and special operations performed by tactical air forces.

Adjacent Unit Situation. Describes the tactical and/or administrative situation at a particular time. This information item provides the recipient such information as location, combat effectiveness, strengths, size, boundaries, movement speeds, direction and readiness. It applies to the situation as it presently exists.

Air Defense Suppression Requirements (SEAD). Nullifying the effectiveness of the enemy air defense. It provides the location, type and number of enemy air defense systems.

Artillery Target Report. Information transmitted for acquired targets which meet the commander's engagement targeting guidance. Crossflow provides for fusion in developing targets for engagement.

Airfields (loca, type, condition). An area prepared for the accomodation (including any building, installations), landing and takeoff of airlift. Contains information on type, location, and condition of an airfield. Type describes the surface and length of the runway, number of runways, and operating conditions.

Airhead Location. A designated area in a hostile or threatened territory which, when seized and held, ensures the continuous landing (parachute or airland) of troops and materiel and provides maneuver space for operations.

Airspace Restrictions. A portion of the airspace in which flight restrictions are imposed. A prescribed air route for aircraft established to prevent friendly aircraft from being fired on by friendly forces. Contains ground coordinates and asociated effective times.

Area of Operations. That portion of an area of war necessary for military operations (all military actions planned and conducted on a topographical complex and its adjacent natural terrain where manmade construction is the dominant feature) either offensive or defensive, pursuant to an assigned mission, and for the administration incident to such military operations.

Assembly Area Location. An area in which a force prepares or regroups for further action.

Assets Available. Those assets by type, by unit available for employment on the battlefield. (Critical Equipment)

Assessment (EW and OPSEC). Effectiveness and potential of an existing or planned intelligence activity.

Avenues of Approach. An air or ground route of an attacking force of a given size leading to its objective or to key terrain in its path.

Axis of Advance. A general route of advance extending in the direction of the enemy which is assigned for purposes of control. An axis of advance symbol the size of the force assigned the axis and is often a road, a group of roads, or a designated series of locations. A commander may maneuver his forces and supporting fires to either side of an axis of advance provided the unit remains oriented on the axis and the objective. Deviations from an assigned axis of advance must not interface with the maneuver of adjacent units without prior approval of the higher commander. Enemy forces that do not threaten security or jeopardize mission accomplishment may be bypassed. An axis of advance is nzot used to direct the control of terrain or the clearance of enemy forces from specific locations. Intermediate objectives are normally assigned for these purposes.

Basic Load % Fill (by type). That quantity of nonnuclear ammunition authorized to be on hand in a unit to meet combat needs until resupply can be accomplished. Size of the basic load is normally determined by corps or the major overseas commander. (Consider Class III - Petroleum, oil, lubricants).

Battle Losses. Major items of equipment, i.e., weapons systems, weapons, etc., destroyed, captured, abandoned on the battlefield.

Battlefield Geometry (Boundaries). A control measure drawn along identifiable terrain features and used to delineate areas of tactical responsibility for subordinate units. Within their boundaries, units may fire and maneuver in accordance with the overall plan without close coordination with neighboring units unless otherwise restricted. Direct fire may be placed across boundaries on clearly identified enemy targets without prior coordination, provided friendly forces are not endangered. Indirect fire may also be used after prior coordinati on. Lateral boundaries are generally used by a corps or division to control combat operations but may be used by smaller units when required. Rear boundaries may be established in defense to facilitate command control. (Coordinated Fire Line, FLOT, FEBA, Free Fire Area)

Bomb Damage Assessment. Information to provide ammunition expenditures and effects on the target between systems at the completion of the conduct of a fire mission.

Bridges/Fording Sites. (River Crossing: An operation conducted as a part of an in conjunction with other operations to rapidly overcome a water obstacle. Terrain objectives are required to ensure the security of the force and crossing sites) (FORD: A shallow part of a body of water that can be crossed without bridging, boats, or rafts. A location in a water barrier where the physical characteristics of current, bottom and approaches permit the passage of personnel and/or vehicles and other equipment that remain in contact with the bottom).

Call for Fire. Information required to be transmitted to request immediate engagement of acquired target by fire support assets. Initiates fire, mission, processing within FS. Utilized for targets meeting commander's guidance for immediate engagement.

Casualty Report. A listing of personnel killed in Action, Missing in Action, Wounded in Action, Disease non-battle injury by officers, warrant officers and enlisted and a total of each.

Check Fire. Information utilized to establish and exchange fire mission commands for the purpose of check firing, cease loading, cancel check firing and cancel cease loading, etc.

Command Mission. The primary task assigned to an individual, unit, or force. It usually contains the elements of who, what, where, and the reason therefore, but seldom specifies how. (To include FRAG OPORD/Plan).

Command/G2 Guidance (PIR). Guidance provide the G2, so that he can prepare the Essential Elements of Information (EEI) and Other Intelligence Requirements (OIR). (Collection Requirements)

Command Controlled Items. (Essential items list - a list of critical and intensively managed items. Those items that are controlled by the commander because of their scarcity, value or planned usage in an upcoming maneuver.

Communication Centers. Location of communication centers to include type of equipment and capabilities.

Concept (Scheme of Maneuver). That part of a tactical plan to be executed by a maneuver force in order to secure its assigned objectives or hold its assigned area. (Concept of Operation - a concise graphic, verbal or written statement that gives an overall picture of a commander's scheme with regard to an operation or series of operations; includes the scheme of maneuver and fire support plan. It is described in sufficient detail for the staff and subordinate commanders to understand what they are to do and how to fight the battle in the absence of further instructions.)

Constraints. An action or circumstance of a temporary or artificial nature that restrits or inhibits normal supply demands (resources) or maneuver movements.

Contingency Plan. . A plan for major events which can reasonably be anticipated in the principal geographic subareas of a command.

Continuity of Operations (CONOPS). The degree or state of being continuous in the conduct of functions, tasks or duties necessary to accomplish a military action or mission in carrying out the national military strategy. It includes the functions and duties of the commander, as well as the supporting functions and duties performed by his staff and others acting under the authority and direction of the commander.

Controlled Supply Rate. The rate of consumption of ammunition that can be allocated, considering the supplies and facilities available for a given period. For ammunition items fired from weapons, this rate is expressed as rounds

per weapon per day. For other items, such as antitank mines, hand grenades, demolition exposures, etc., the rate is expressed in terms of units of measure for specified items, e.g., per day, per week.

Coordinating Instructions. Provides information applicable to two or more units.

Critical Personnel Shortages (MOS). Those MOSs and quantity whose shortage affects the combat effectiveness of a unit.

Critical Situation Alert. All the conditions and circumstances which affect a unit or command at a critical time.

Critical (Key) Terrain. Any locality or area, the seizure or retention of, which affords a marked advantage to either combatant.

Essential Elements of Information. The critical items of information regarding the enemy and his environment needed by the command (by a particular time) to compare with other available information and intelligence in order to assist him in reaching a logical decision.

Immediate Engagement Target. The act of force to acquire, engage and neutralize or destory threat firepower systems (tank, combat vehicles, ATGMs, etc) within the battle area. It includes the tasks of employing and coordinating supporting weapons such as mortars, field artillery, and tactical air, as well as countermobility and electronic-warfare assets which enhance the target servicing effort.

Mission Fired Report. Provides surveillance of engagement of acquired target. Information is essential for management of battlefield target data and file management.

Operation Order. A directive issued by a commander to subordinate commanders for the purpose of effecting the coordinated execution of an operation.

Operation Plan. A plan for operations extending over a considerable space and time and usually based on stated assumptions. It may cover a single operation or a series of connected operations to be carried out simultaneously or in succession. It is the form of directive employed by high echelons of command in order to permit subordinate commanders to prepare their supporting plans or orders. The

designation "plan" is often used instead of "order" in preparing for operations well in advance. An operation plan may be put into effect at a prescribed time or signal. It then becomes the operation order.

Report Request. Allows reporting of criteria for all source processing. The information is essential in the commander's decision process.

ESSENTIAL ELEMENTS OF FRIENDLY INFORMATION (FRIENDLY VULNERABILITIES

Activity (Enemy) - A function or mission being performed by the enemy.

Aircraft Report - The number, type and location of attack aircraft.

Attack Helicopters - Number, type, location of attack helicopters.

Enemy Mission/Objective - G2 evaluation of what the enemy is attempting to accomplish.

Enemy Situation/Assessment - G2 evaluation of enemy vulnerabilities.

Enemy Weapons System - Number, type and location of enemy weapon systems including artillery and antitank systems. (En Air Defense, En Antitank System, En Artillery).

Engineer Support Required - The coordination of engineer effort within an area of operations facilitated by use of area and task assignments.

Friendly Unit Information - The lowest structual level, echelon, or point at which organizational control or authority of the subject unit concentration.

Obstacle Plan - That part of an operation plan (or order) which is concerned with the use of obstacles to enhance friendly fires or to canalize, direct, restrict, delay, or stop the movement of an opposing force.

Mobility Operations - Obstacle reduction by engineer units to reduce or negate the effects of existing or reinforcing obstacles. The objectives are to improve movements of maneuver/weapon systems and critical supplies and to construct covered and concealed routes to and from battle positions.

Survivability Operations - The development and construction of protective positions such as earth berms, dug-in positions, overhead protection and counter-surveillance measures to reduce the effectiveness of enemy weapon systems.

Terrain Reinforcements - The development of terrain to degrade enemy mobility (countermobility) or to enhance friendly survivability through the construction of fighting positions and cover.

Electronic Warfare Tasking - The use of electromagnetic energy to determine, exploit, reduce or prevent hostile use of the electromagnetic spectrum and to ensure friendly use thereof.

Electromagnetic Warfare Support Measures - Actions taken to search for, intercept, locate and identify enemy electromagnetic energy sources for the purpose of employing tactical friendly forces or exploitation for intelligence purposes. Includes interception, identification, analysis and locating.

Electronic Countermeasures - Actions taken to prevent or reduce the enemy's effective use of the electromagnetic spectrum. Includes jamming and electronic deception.

Electronic Deception - The simulation and/or manipulation of friendly electromagnetic radiations and the initiation of enemy electromagnetic radiations for the purpose of deceiving the enemy.

Electronic Counter Countermeasures - Actions taken to ensure friendly use of the electromagnetic spectrum against electronic warfare. Includes antijamming, authentication, radio discipline and MIJI reporting.

Main Battle Area - That portion of the battlefield extending rearward from the FEBA and in which the decisive battle is fought to defeat the enemy attack. Designation of the main battle area may include the use of lateral and rear boundaries.

Activity (Friendly) - Operation being performed by a unit; i.e., offensive, defensive, retrograde, etc.

Coordinated Fire Line - A line beyond which all surface-to-surface fire support means (mortar, field artillery, and naval gunfire) may fire at any time within the zone of the establishing headquarters without additional coordination. Its purpose is to expedite attack of targets beyond the coordinated fire line. It is usually established by brigade or division, but may be established by battalions. Date-time group indicates effective time.

Intelligence Summary - A specific report providing a summary of items of intelligence information normally produced at battalion/squadron or higher level in tactical operations usually at six-hour intervals.

Intelligence - The product resulting from the collection, evaluation, analysis, integration and interpretation of all available information concerning an enemy force, foreign nations, or areas of operations and which is immediately or potentially significant to military planning and operations.

Combat Information - Data that can be used for fire or maneuver decisions as received without further processing, interpretation, or integration with other data.

Minefields - An area of ground containing mines laid with or without pattern. Boundaries are drawn to scale, where known, to indicate actual extent of field when a series of rows are laid in a definite pattern. The number of mines is indicated in a box adjacent to the boundary and lanes and gaps are depicted. Scatterable minefield, date-time group designates self destruction time. Symbols for the type mines in the field are entered within the boundaries.

Movement Table Listing - Elements of a unit movement table (Plan). Includes unit identification, specific routes, start points, check points, release points, times, aerials, intervals, spacing, road speeds and traffic control points. (Movement Routing)

NBC 1 - Transmitted as soon as sufficient information is available on type of NBC attack. (Initial Report)

NBC II - Used by all echelons of the Joint Task Force who evaluate the effects of a nuclear, biological, or chemical attack in their respective area of operations.

NBC III - Provides for immediate warning of expected chemical, biological or radiological contamination or hazardous area.

NBC IV - Used to report the measured dose rate and decay level resulting from nuclear detonations.

NBC V - Used to report areas of chemical, biological, or radiological contamination or hazard.

Obstacles/Barriers - Any natural or manmade obstruction that canalizes, delays, restricts or diverts movement of a force. The effectiveness of an obstacle is considerably enhanced when covered by fire. Obstacles can include: abatis, antitank ditches, blown bridges, built up areas, minefields, rivers, road craters, terrain and wire.

Order of Battle - Intelligence pertaining to identification, strength, command structure and disposition of personnel, units and equipment of any enemy force.

Planned Targets - A geographical area, complex or installation planned for capture or destruction by military forces. (Priority Targeting Requirement)

Target Acquisitions - The detection, identification and location of targets in sufficient detail to permit attack by weapons.

Target Servicing - The act of a force to acquire, engage and neutralize or destroy threat firepower systems (tanks, combat vehicles), ATGMS, etc.) within the battle area. It includes the tasks of employing and coordinating supporting weapons such as mortars, field artillery, and tactical air, as well as countermobility and electronic warfare assets which enhance the target servicing effort.

Petroleum, Oil, Lubricants Locations - Supply and Distribution Points for POL. Also quantity on hand at the unit and number of days of operation.

Priority of Issue - Priority by unit and by type of materiel to replenish combat essential supplies, repair parts, ammunition, etc.

Priority of Support to Combat Elements - The process of allocating available resources to optimize combat power.

Target Analysis - The examination of a potential surface target to determine its significance to the mission of the force, the need for immediate attack and the capability and

suitability of available fire support elements for attack. Target analysis is the responsibility of FSCOORDs, FSOs, and FDOs and is performed in varying degrees at all echelons in fire support and fire direction facilities.

Priority for ADA - The continual process of analyzing, allocating and scheduling air defense and integrating them with maneuver to optimize combat power.

Release Policy (Nuclear) - Policy established by theater or army specifying the conditions under which nuclear munitions can be employed.

Replacement Priorities - Priority established to replenish losses in the field. Proper number and type of replacements are determined by checking the accuracy of strength reports and comparing losses on strength reports with losses reported through operational channels.

Restrictive Fire Area - An area in which specific restriction are imposed and into which fires in excess of those restrictions will not be delivered without prior coordination with the establishing headquarters. A restrictive fire area may be established at battalion and higher levels. It is generally located on identifiable terrain to facilitate recognition from the air. Effective time(s) identified by date time group.

Roads - A listing of roads to include location, type, condition, and limiting factors.

Routes - The prescribed course to be traveled from a specific point of origin to a specific destination. Often begins with a start point and ends at a release point. Designated by a code name or number.

Route Classification - Classification assigned to a route indicating the heaviest vehicle that can be accepted. It is based on the weakest bridge or portion of the route.

Railways - A listing railways to include location, type and condition.

Required Supply Rate - The amount of ammunition expressed in terms of rounds per weapon per day for ammunition items fired by weapons, and in terms of other units of measure per day for bulk allotment and other items, estimated to be required to sustain operations of any designated force without restriction for a specified period. Tactical commanders use this rate to state their requirements for ammunition to support planned tactical

operations at specified intervals. The required supply rate is submitted through command channels. It is consolidated at each echelon and is considered by each commander in subsequently allocating the available supply rate within his command.

Serious Incidents - Those incidents that the commander considers serious or whose occurence could impact on the effectiveness of the unit.

Sortie - One aircraft making one takeoff and one landing. An operational flight by one aircraft.

Special Operations - Types of military operations which require specialized troops, equipment or techniques such as river crossings, military operations in urbanized terrain, etc. Secondary or supporting operations which maybe adjuncts to various other operations and for which no one service is assigned primary responsibility.

Strike Warning - Warning of an attack which is intended to inflict damage on, seize or destroy an objective.

Target Criteria - Provides for the exchange of tasking, cueing and establishment of targeting criteria based upon the commander's guidacne. Targets meeting the established criteria will be reported via the artillery target report.

Target Request - Provides a one time query or a standing request (SRI) for targeting information. A query retrieves artillery target reports from the data base for transmission. An SRI screens each incoming message to the data base and if given parameters are satisfied, auto-routing of the requested data occurs.

Early Warning - Early notification of the launch, or approach, of unknown weapons or weapon carriers.

Tactical Warning - A notification that the enemy has initiated hostilities. Such warning may be received any time from the launching of the attack until it reaches it target.

Event Type and Size - Identification of the type of event and determination of the size or numbers of weapons and units.

Supply Shortages - Identification of supplies which because of their shortage could affect the combat effectiveness of a unit.

Task Organization - A temporary grouping of forces designed to accomplish a particular mission. Task organization involves the distribution of available assets to subordinate control headquarters by attachment or by placing assets in direct support or under the operational control of the subordinate.

Organize for Combat - To develop an organization in such a way that the unique capabilities of different type forces complement each other.

Terrain - Describes the topography, trafficability, natural obstacles, and conditions of a geographic area of concern to the force commander.

Weather Data - Used to analyze current weather conditions and forecast future conditions that could impact on the scheme of maneuver. (To include effective wind message.)

Free Text - The text of a message containing information that the originator wishes to be conveyed to the addressees for accomplishing the exchange of man readable information.

Graphic Message - Messages using cartographic and photogrammetric arts displaying offense and defense routes, corridors, etc.

Interference - Any electrical disturbance which causes undesirable responses in electronic equipment.

Query and SRI - The SRI screens each message to determine if it satisfies the given parameters. If so, a copy of the message is automatically canted to the user(s) identified in the distribution field. Queries are messages retrieved records from the data base. Any user can, at any time, retrieve records from the data base. Queries are searches of the data base for information.

2. The following list represents key information used by the Force Commander. Control systems must ensure that this information is available at all times at the Force Level to facilitate the decision making process.

a. Enemy Information

(1) Essential Elements of Information

(2) Critical Situation Alert

(3) Notification of Location of Enemy

(a) Tank/Antitank Systems
(b) Artillery
(c) Attack Helicopters
(d) Mission/Objectives
(e) Significant Activity
(f) ADA

(4) Intelligence Summary

(5) Order of Battle

(6) Rear Area Activity

(7) Situation Assessment

(8) Assessment (EW & OPSEC)

b. Friendly Information.

(1) Aircraft Allocations/Priorities and Requirements

(2) Aircraft Report

(3) Adjacent Unit Situation

(4) Air Defense Suppression Requirements (SEAD)

(5) Airfields

(6) Airhead Locations

(7) Area of Operations

(8) Assembly Area Location

(9) Assets Available

(10) Battle Losses (Equipment)

(11) Bomb Damage Assessment

(12) Battlefield Geometry (Boundaries),(FLOT, FEBA)

(13) Bridges/Fording Sites

(14) Check Fire

(15) Command Mission

(16) Command Guidance

(17) Command Controlled Items

(18) CONOPS

(19) Constraints

(20) FLOT (Limiting Points)

(21) Friendly Activity

(22) Friendly Unit Information

(23) Higher Echelon Situation

(24) Immediate Engagement Target

(25) Interference

(26) KIA, MIA, WIA, DNBI

(27) Minefields

(28) Priorities for ADA

(29) Replacement Priorities

(30) Required Supply Rate

(31) Sorties (#, type)

c. Plans/Orders - Mission

(1) Concept (Scheme of Maneuver)

(2) Command Mission (FRAG)

(3) Plans

(4) Task Organization

d. Other Information/Environment

(1) Critical Terrain

(2) NBC Reports

(3) Obstacles/Barriers

(4) Priority of Issue

(5) Priority of Support to Combat Elements

(6) Release Policy/Procedures

(7) Serious Incidents

(8) Weather Data (Effective Wind Message)

(9) Graphic Message

(10) Query and SRI

Note:

1. U.S. Army, Operational and Organizational Plan for the Maneuver Control System, (1984).

APPENDIX B: COMMANDERS CRITICAL INFORMATION REQUIREMENTS SURVEY SHEET

Contained herein is the Commanders Critical Information Requirements (CCIR) Survey Sheet. At Annex A to Appendix A is a listing of each of the CCIR Information Elements.

The CCIR sheet directions indicate that 25 information elements were selected from the FLIRP for survey, however, only 24 are listed. Number 13 was eliminated from the survey sheet without a readjustment of the numbers. All calculations and references to the CCIR elements, within this study, are based on a 1-24 numbering sequence. This results in a reduction of the sequence numbers for all CCIR elements from 14 through 25. e.g. Number 14 is now 13; number 15 is now 14, etc. The reader must therefore make this numerical adjustment when comparing the CCIR survey sheet to the discussion and results in Chapter 4, 5, and 6.

Commander's Critical Information Requirements (CCIR)

NAME _____

UNIT _____

DIRECTIONS: The following 25 information elements were selected from the FLIRP as the minimum essential elements a Commander needs for his decision making process. These are a starting point for the assessment of your CRITICAL INFORMATION REQUIREMENTS. Indicate a "Y" if determined critical; otherwise specify "N". The objective is to minimize the listing; however, feel free to add any from the FLIRP you feel applicable to support your CCIR.

Y	N	1.	Adjacent Unit Situation
Y	N	2.	Area of Operations
Y	N	3.	Assessment (EW & OPSEC)
Y	N	4.	Assets Available
Y	N	5.	Avenues of Approach (time/distance factor)
Y	N	6.	Axis of Advance Informati on
Y	N	7.	Battlefield Geometry
Y	N	8.	Command Mission
Y	N	9.	Command Guidance
Y	N	10.	Command Controlled Items
Y	N	11.	Concept of Operation
Y	N	12.	Critical Situation Alert
Y	N	14.	Enemy Aircraft
Y	N	15.	Enemy Mission
Y	N	16.	Enemy Situation (Time Distance Factor)
Y	N	17.	Enemy Weapons Systems
Y	N	18.	Friendly Activity
Y	N	19.	Friendly Unit
Y	N	20.	Intelligence Summary
Y	N	21.	Key Terrain
Y	N	22.	Radiation Dose Status
Y	N	23.	Release Policy (Nuclear)
Y	N	24.	Target Criteria
Y	N	25.	Task Organization

FLIRP ADDITIONS

APPENDIX C

CCIR GENERAL OFFICER SURVEY RESPONDENTS

MAJ GENERAL Gerald T. Bartlett, 4 ID
MAJ GENERAL M. J. Conrad, 1 CAV
MAJ GENERAL John S. Crosby, USAFAS
MAJ GENERAL Howard Crowell, 3 ID
MAJ GENERAL Henry Doctor, Jr., 2 ID
MAJ GENERAL Charles W. Dyke, 8 ID
MAJ GENERAL Richard Graves, 3 AD
MAJ GENERAL Claude Kicklighter, 25 AD
MAJ GENERAL Bobby J. Maddox, USAAVNC
MAJ GENERAL James P. Maloney, USAADAC
MAJ GENERAL James Moore, 7 ID
MAJ GENERAL Robert W. Riscassi, 9 ID
MAJ GENERAL Crosbie Saint, 1 AD
MAJ GENERAL H. Norman Schwartzkopf, 24 ID
MAJ GENERAL J. E. Thompson, 101 AASLP
MAJ GENERAL Edward L. Trobaugh, 82 ABN
MAJ GENERAL Dale A. Vesser, 5 ID
MAJ GENERAL Ronald L. Watts, 1 ID
MAJ GENERAL Sidney T. Weinstein, USAIC
LIEUTENANT GENERAL Robert Bergquist, LOGCENTEP
LIEUTENANT GENERAL Joseph T. Palastra, I Corps
LIEUTENANT GENERAL Walter F. Ulmer, Jr., III Corps
LIEUTENANT GENERAL R. L. Wetzel, V Corps
LIEUTENANT GENERAL Alexander Weyand, IX Corps
COLONEL Robert S. Fiero, USAIC

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