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SYNCHRONIZATION OF COMBAT POWER
AT THE TASK FORCE LEVEL:
DEFINING A PLANNING METHODOLOGY

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

by

CLYDE L. LONG, MAJOR, USA
B.U.S., Eastern New Mexico University, 1972
M.A., Webster University, 1988

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Fort Leavenworth, Kansas
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ABSTRACT

**SYNCHRONIZATION OF COMBAT POWER AT THE TASK FORCE LEVEL:
DEFINING A PLANNING METHODOLOGY, by Major Clyde L.
Long, USA, 162 pages.**

This study seeks to identify a planning model and matrix from current doctrinal sources that explains how to synchronize combat operations in planning. It examines most current and emerging heavy maneuver doctrine specifically in regard to the synchronization process defined in FM 100-5, *Operations*.

The review of literature concludes that current doctrine does not define the synchronization process at any level of command. In addition, the review of literature reveals that the terms necessary for an understanding of how to synchronize combat activities are confused in U.S. doctrinal manuals.

The thesis presents definitions for the terms activities, battlefield operating systems; redefines planning factors, and relates these terms to time, space, and purpose used in the doctrinal definition of synchronization.

In addition, the study presents a planning model and matrix which the author believes will help battalion level commanders and staffs synchronize operations during the planning process. The proposed matrix and model were evaluated by former commanders, doctrinal writers, and instructors at the Command and General Staff College to determine if the model and matrix had application in the planning and teaching of synchronization.

The study concludes that the model and matrix are applicable for use as instructional aids and for use by field units to help organize the myriad of activities that occur during the planning of combat operations.

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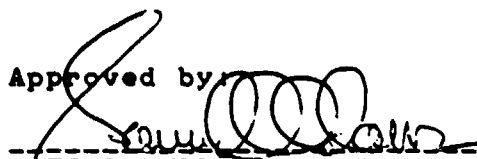
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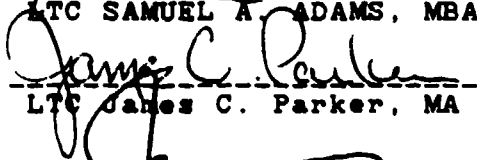
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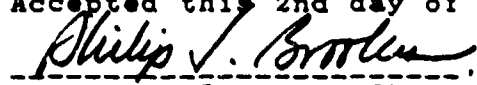
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DEFINING A PLANNING METHODOLOGY, by Major Clyde L.
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This study seeks to identify a planning model and matrix from current doctrinal sources that explains how to synchronize combat operations in planning. It examines most current and emerging heavy maneuver doctrine specifically in regard to the synchronization process defined in *FM 100-5, Operations*.

The review of literature concludes that current doctrine does not define the synchronization process at any level of command. In addition, the review of literature reveals that the terms necessary for an understanding of how to synchronize combat activities are confused in U.S. doctrinal manuals.

The thesis presents definitions for the terms activities, battlefield operating systems; redefines planning factors, and relates these terms to time, space, and purpose used in the doctrinal definition of synchronization.

In addition, the study presents a planning model and matrix which the author believes will help battalion level commanders and staffs synchronize operations during the planning process. The proposed matrix and model were evaluated by former commanders, doctrinal writers, and instructors at the Command and General Staff College to determine if the model and matrix had application in the planning and teaching of synchronization.

The study concludes that the model and matrix are applicable for use as instructional aids and for use by field units to help organize the myriad of activities that occur during the planning of combat operations.

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CHAPTER ONE

Definition of the Problem

If I am able to determine the enemy's dispositions while at the same time conceal my own then I can concentrate while he must divide. And if I concentrate while he divides, I can use my entire strength to attack a fraction of his. There, I will be numerically superior. Then, if I am able to use many to strike few at the selected point, those I deal with will be in dire straits.
(Sun Tzu, 450 BC, p.98)

Background

Winning in combat requires that a force mass its combat power against another force's weakness to inflict enough damage on that force to cause its defeat or destruction. This simple sounding principle is easy to state, but quite difficult to achieve. It is not a new concept as evidenced by the brief quote above from Sun Tzu, some 2000 years ago. The United States Army's tenet of synchronization is the essence of the teachings of all the great masters of the military art with regard to achieving victory through the proper arrangement of combat activities in time and space. *FM 100-5, Operations*, the United States Army's capstone doctrinal manual, defined and explained synchronization at the operational and tactical levels of war in the 1982 version. Following is a portion of the explanation provided in the revised 1986 version of this doctrinal manual:

Synchronization is the arrangement of battlefield

activities in time, space and purpose to produce maximum relative combat power at the decisive point. (FM 100-5, Operations, 1986, p.17)

Technology has increased the tempo of combat and has multiplied the lethality of the battlefield through increased weapons ranges and improved munitions. Decision making time has been dramatically reduced as new weapons systems are developed with the capability for faster rates of fire, more lethal effects, and greater maneuver speeds. Although technology has not changed the fact that time and space are constant factors within which all combatants must operate, it has reduced the amount of planning, preparation, and execution time available.

Mastery of time and space and the impact of these factors on the battlefield are basic requirements for all commanders. Understanding how to "arrange" activities in time and space or more importantly, how to convey this knowledge to subordinates is the key challenge facing combat leaders today. (Note 1)

Since the inception of the National Training Center (NTC) at Ft. Irwin, California in 1982, the senior leadership of the United States Army has recognized that battalion commanders have difficulty in synchronizing all the elements of combat power at their disposal. Unless commanders master the synchronization process, they cannot fully utilize the many resources available to maximize a battalion's killing potential. (Note 2)

Indeed, a lack of understanding the synchronization

process and the ability to execute synchronization contributes to low success rates achieved in the first several engagements at the NTC. (Note 3) As units gain an appreciation of time-space relationships and begin to master the synchronization process, they are more successful in executing combat operations.

Although the TRADOC school system should produce fully trained members of the battalion TF battle staff who understand the synchronization process, this requirement currently rests with the battalion commanders. Battalion TF commanders must train their battle staffs in the synchronization process, but most commanders do not seem to understand it themselves.

In 1986, the Army published the newest version of its capstone warfighting manual, *FM 100-5, Operations*. This updated doctrinal manual clarified many subject areas that were unclear in the 1982 version, but did not address synchronization of combat activities in sufficient detail to explain how this was accomplished.

Over the course of the next two years, senior Army leaders continued to be concerned at the lack of progress battalion commanders had made in their ability to synchronize combat activities at the TF level. (Note 4) Independent studies acknowledge the significance of the synchronization problem; however, there is no consensus on how to solve it. The *Leader Development Study* (1987) has identified a major part of the problem as it points out that

the Army is losing proficiency in the basics and that some of our inability to master synchronization of combined arms operations is rooted in branch tactical and technical weaknesses. (Note 5)

In July, 1988, the decision was made to expand the tactics portion of the Pre-Command Course (PCC) at Fort Leavenworth, Kansas from one day to two weeks. The intent was to teach battalion command designates a method of synchronizing combat operations at the TF level prior to assumption of command. (Note 6) To 'ramp up' their tactical knowledge and ability, the most sophisticated computer simulations available were incorporated into the training program. The pilot course is scheduled for May, 1989.

Problem Statement and Research Questions

Now those skilled in war must know where and when a battle will be fought. They measure the roads and fix the date. They divide the army and march in separate columns. Those who are distant start first, those who are near by, later. Thus the meeting of troops from distances of a thousand li takes place at the same time. It is like people coming to a city market.

Tu Yu, a battle captain quoted by Sun Tzu, described part of a planning process toward achieving mass, a critical principle of war, 2000 years ago (Sun Tzu, 500 BC, p.99). Central to all operations is a plan which has been synchronized during the planning process to maximize the use of all available resources and ensure that every resource is employed at the critical place and time. To achieve mass, a commander must employ the other principles of war to ensure

the use of every resource at his disposal at the right place and time. Easily stated, but how is it done?

U.S. Army doctrinal manuals should provide clear guidance on how all the resources available to a commander can be synchronized to achieve victory. If synchronization is a process and a result as stated in the Army's capstone warfighting manual, the process should be very clearly defined in Army doctrine.

The primary research question which must be answered is this: Has U.S. Army doctrine provided ample explanation of the synchronization of combat operations to permit an understanding of the process at the TF level? To answer this question, several other questions concerning Army doctrine must first be addressed:

0 Does current doctrine provide a clear description of the synchronization process?

0 Does current doctrine define "battlefield activities" at any level of command?

0 Does current doctrine provide a list of activities at any level of command?

0 Does current doctrine provide a process for reducing the activities to time?

0 Does current doctrine provide a standard method of grouping the activities to be synchronized?

0 Does current doctrine explain how time is related to space and how activities are to be arranged in this time space continuum?

O Does current doctrine provide a synchronization planning model or matrix that will help organize and clarify the synchronization process?

All these questions may be answered with a simple yes or no response, but attempting to define the synchronization process and produce an easily understood synchronization planning model is not as easily accomplished.

There have been exhaustive studies conducted to determine the causes for poor synchronization of combat activities, but in almost every case the studies have failed to identify the lack of an accepted model for understanding the total synchronization process. The problem, simply stated, is to identify a synchronization planning process that is applicable at the TF level. (Note 7)

Assumptions

Several assumptions must be made before this study can be completed. First, the enemy force against which the U.S. Army wishes to prepare its TF commanders to fight is a Soviet trained force which conforms to the doctrine of the Soviet Union. Second, the United States Army's Training and Evaluation Plan (ARTEP) standards of performance are achievable. Finally, commanders currently have difficulty synchronizing the TF combined arms fight.

Definitions

TRADOC Regulation 11-7 (1986), currently being revised, provides a definition of doctrine which will be

included here only because this thesis must examine some of the current U.S. Army doctrine.

Doctrine. Fundamental principle by which the military forces or elements thereof, guide their actions in support of national objectives. It is authoritative but requires judgement in application. Doctrine includes tactics, techniques, and procedures that describe how--

- (1) The Army fights.
- (2) Units and weapons systems are integrated into tactics.
- (3) Command and control functions.
- (4) Combat support and combat service support are provided.
- (5) Forces are mobilized, deployed, employed, and sustained. (3 January, 1986, Glossary-4)

To add clarity to this discussion, it is necessary to define some of the terms which will be used in this thesis. Three terms are essential to this study: tactical maneuver doctrine, other doctrinal literature, and other military sources.

First, tactical maneuver doctrine is combined arms doctrine which is found in *FM 100-5, Operations*; *FM 100-15, Corps Operations*; *FM 71-100, Division Operations*; *FM 71-3, Armored and Mechanized Infantry Brigade*; *FM 71-2, The Tank and Mechanized Infantry Task Force*; and *FM 71-1, Tank and Mechanized Infantry Company Team*. These six manuals constitute the U.S. Army's hierarchy of combat heavy tactical maneuver doctrine.

Other doctrinal literature is defined as supplemental doctrine, and includes tactics, techniques and procedures which are found in field manuals (FMs) other than those mentioned above. These FMs supplement the heavy maneuver

doctrine and in many instances provide "how to" information not contained in the maneuver doctrine. They do not take precedence over the tactical maneuver doctrine.

Other military sources include training circulars, field circulars, ARTEPs, after action reports (AARs), and professional independent works. Of these, two are most significant to this study.

First, Army Training and Evaluation Programs (ARTEPs) contain specific tasks that each type unit (infantry, armor, etc.) should be capable of performing. ARTEPs establish tasks, conditions, and standards of performance for each type unit in the Army's force structure. These publications contain time standards which fully trained units should be capable of meeting for various battlefield tasks. Commanders analyze their wartime mission, determine ARTEP tasks which their unit must perform to accomplish their wartime missions, and translate these tasks into the units mission essential task list (METL). The METL tasks become the central focus for training of the battalion TF during peacetime training.

The second significant source is the after action report (AAR) which is a record of a unit's performance in combat during war, or its ARTEP mission performance during peace time training. AARs provide valuable lessons learned from actual combat experience and from realistic simulated combat training exercises. The lessons they provide often help shape current and future doctrine, tactics, techniques,

and procedures. By reviewing the standards achieved by numerous units under actual or simulated combat conditions, more realistic time standards can be determined for various battlefield tasks.

As mentioned earlier in the thesis questions, a portion of this study seeks definition of the term 'activities' and its relationship to time and space.

Limitations and Scope

For the purpose of this research project several limitations are necessary. Research for this study will consider only the United States Army's interest in the problem of synchronization and will be limited to sources written in the English language. The Combined Arms Research Library (CARL) will be the only library source for information used. The remainder of the data gathered will be from open source literature available within and through the Command and General Staff College (CGSC). Only unclassified data will be used in this thesis.

In addition, the scope of this study is limited to the search for and identification of a model for the training and planning of synchronized combat operations based on current U.S. doctrinal sources. Heavy force synchronization issues will be the central focus for this study. Therefore, doctrinal sources dealing with light organizations will not be explored. Doctrine, as defined earlier, includes tactics, techniques, and procedures (TTP). An examination of doctrine will be limited to the sources

that the author believes should provide the structural process for synchronization. TTP manuals will be examined during the course of this study only to the extent necessary to provide examples of how they support and clarify the synchronization process or fail to accomplish this goal. Only the most current doctrinal sources available to the author will be used in the study.

The primary geographical region used in this detailed study is the National Training Center (NTC), Ft. Irwin, California. The NTC has been selected because there is an abundance of data and lessons learned available. In addition, it is currently used in the Pre-Command Course at the Command and General Staff College as the location for the training scenario for brigade and battalion command designates' tactical instruction.

Significance of the Study

Synchronization is one of the four tenets of AirLand Battle (ALB) doctrine as published in FM 100-5, the Army's capstone warfighting manual. It is a tenet because of its significance in translating the concept of ALB into action. The battalion commanders who are charged with executing ALB doctrine must understand and be able to implement the tenets of that doctrine. If synchronization is 'both a process and a result,' as stated in FM 100-5, then the process of synchronizing all the elements of combat power must be understood and internalized by the entire officer corps to

ensure the desired result. (Note 8)

If U.S. doctrine is not clear concerning synchronization, or more precisely, if there is a lack of clear and consistent terms, techniques, and procedures, this would tend to obscure rather than clarify the subject of synchronization in the field. Additionally, the 'how to' tactical manuals have not yet been published. Once published, these manuals should present a standard synchronization model for understanding the process.

As mentioned previously, battalion commanders are currently responsible for training their battle staffs. Few battalion level staff officers are thoroughly trained in combined arms operations when they arrive at a unit. The training these young officers receive in their respective branch schools and the Combined Arms and Services Staff School (CAS²) has done little to prepare them for the detailed synchronization planning necessary at TF level. (Note 9)

Unless commanders have and can use an available model for teaching synchronization in the planning process, they will have difficulty explaining the process and may not be able to train themselves, their staffs, supporting agencies, and subordinate commanders to synchronize the fight.

The objective of this study is to identify a synchronization planning model and a synchronization planning matrix. Once identified, these tools can be used to assist battalion commanders in learning, teaching, and

executing synchronization.

While this research project will focus primarily at the TF level, the synchronization principles involved would appear to be similar at other levels. This study will provide recommendations on how to clarify and improve U.S. Army tactical doctrine concerning synchronization at the TF level and identify principles which may have broader application.

Methods and Procedures

The initial portion of this research project was concerned with a review of all relevant doctrinal literature related to the synchronization process. This phase of the study focused on answering the research questions specified previously.

Phase two of this research project involved an analysis of all the doctrinal sources examined during phase one to clearly define the synchronization process. The synchronization process identified during this phase of the research process is the synchronization model which was used as a method for planning the synchronization of combat activities at the battalion TF level. To graphically demonstrate all the elements of synchronization, a matrix has been employed to help the reader understand the command and staff relationships involved in the synchronization process.

During the third phase of this study, a scenario was

identified which provided a vehicle for the application of the synchronization model and matrix developed during phase two. This scenario presents a corps level tactical situation which helps demonstrate the vertical and horizontal synchronization issues involved in planning combat operations. The scenario introduces each commander's concept of operations starting at corps level and proceeds down to the battalion TF commander.

The fourth phase of this study further developed the scenario focusing strictly at the TF level. The synchronization model and matrix are applied during this phase to test their validity as a planning methodology. Planning considerations discovered during the review of literature were used to help arrange activities and are central to the synchronization model.

The products of this thesis, a synchronization model and a synchronization planning matrix, were then evaluated by former battalion or higher level commanders, doctrinal authors, and CGSC instructors to gain their insights concerning synchronization and specifically to evaluate the proposed synchronization model and matrix. The comments and suggestions from these selected professional soldiers were carefully considered and either incorporated into the final thesis products or highlighted in the thesis assessment chapter.

REFERENCE NOTES CHAPTER ONE

1. Maddox, D. M., BG. *Improvement of FA Proficiency at NTC*. Memorandum for Commander, III Corps and Commander, III Corps Artillery, 2 December, 1986.

BG Maddox states that timing of fires is most critical and that "The scheme of maneuver, barrier plan, and fire support plan must all fit together to create a single, integrated battle....While it is true that incompetent artillery units cannot provide effective fire support, a fully combat ready artillery unit cannot cause effective integration and synchronization of fire support without the thorough understanding and involvement of the maneuver commander." (pp.1 & 2)

2. Abrams, C. W., COL. *Synchronization*. Memorandum for MG Sullivan, CGSC, Ft. Leavenworth, Ks. 6 April, 1988.

This memo highlights the need for detailed procedures for the synchronization of combat power when under time pressure. It suggests that brigade tactical operations be taught at CGSC using simulations that stress all the operating systems and not just maneuver.

3. Maddox, D. M., BG. *Improvement of FA Proficiency*. Memorandum for CG, III Corps, Ft. Carson, Colorado, 18 February, 1987.

BG Maddox states "Maneuver commanders are not taught adequately how to synchronize combat power...bring together direct fire, artillery, mortars, helicopters, CAS, EW, and engineers through maneuvers, positioning and timing." (p.2)

4. Mullen, W.J. III, BG. *CALL Issue: Battle Staff Operations (Synchronization)* Memorandum for the Deputy Commandant, USACGSC, 31 March 1988. Memo for MG Sullivan. Subject: *Synchronization*. 6 April, 1988.

5. Goldsmith, M., *Applying the NTC Experience: Tactical Reconnaissance*. The Rand Corporation, April, 1987.

This special study focused primarily on reconnaissance and counter-reconnaissance. The problem remains one of synchronizing all the elements of combat power available to the maneuver commander.

Sullivan, G.L., MG. *Leader Development Study*, Fort Leavenworth, Kansas. 24 August, 1987.

Special study group directed by the TRADOC commander to study leadership in the U.S. Army. The

group was headed by MG Gordon L. Sullivan.

6. Wallace, S.W., COL. *Tactical Commanders Development Program*. Fact sheet for MG Peay, CGSC, Ft. Leavenworth, Kansas, 1 Aug. 1988.
7. Angerman, W. C. LTC. *After Action Report, NTC, Rotation 88-4*. Memorandum for Commander, Combined Arms Training Activity, Ft. Leavenworth, Kansas, 16 February, 1988.

LTC Angerman states in part: "Units understand FM level doctrine on staff operations. What they need is specific guidance and training on how to coordinate the planning process and troop leading procedures (a method) and synchronize the seven operating systems." (p.1)

8. Heimgartner, H. D., LTC. *End of Tour Interview with LTC Peter Manza*. Memorandum to Commander, National Training Center, Ft. Irwin, California, 28 June, 1988.

LTC Manza states that he was best able to exploit the Blue forces "failure to coordinate their activities." (p.1)

9. Fish, E. G., LTC, Stephenson, S., MAJ, & Sisco, J., MAJ. *Synchronization*. Fort Irwin, California. March, 1989.

This was a white paper prepared for presentation at the Tactics Directors Conference, March, 1989. The lack of experience and training of the TF battle staff is clearly highlighted in this white paper discussion of synchronization problems at the National Training Center on pages 4 thru 6.

REFERENCE LIST CHAPTER ONE

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Sun Tzu (Ed. and Trans. Griffith, S.B.) [*The Art of War*]. New York: Oxford University Press, 1963.

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CHAPTER TWO

Review of Literature

No study of military doctrine, tactics, techniques, or procedures can be considered complete until the existing doctrinal literature has been examined closely. This chapter will review the hierarchy of U.S. Army tactical maneuver doctrine starting with *FM 100-5* and proceed down through corps, division, and brigade to the battalion TF level.

The purpose for this review of literature is to see if a synchronization model or process exists within current doctrine which provides battalion commanders the knowledge necessary to functionally arrange combat activities in time and space. This process must relate time and space to each activity and provide a systematic approach to planning and executing synchronized operations.

Once the tactical maneuver doctrinal manuals have been examined, the search for a synchronization model will be expanded to include other doctrinal literature. Additionally, training circulars, pamphlets and after action reports from the National Training Center will be explored to see if they help clarify the synchronization process and more clearly define activities related to the synchronization planning process.

The logical place to start is with the U.S. Army's capstone doctrinal manual, *FM 100-5, Operations*, which

provides a lengthy definition of synchronization.

Synchronization is the arrangement of battlefield activities in time, space and purpose to produce maximum relative combat power at the decisive point. Synchronization is both a process and a result. Commanders synchronize activities; they thereby produce synchronized operations.

Synchronization includes but is not limited to the actual concentration of forces and fires at the point of decision. Some of the activities which must be synchronized in an operation-interdiction with maneuver, for example, or the shifting of reserves with the rearrangement of air defense-must occur before the decisive moment, and may take place at locations far distant from each other. While themselves separated in time and space, however, these activities are synchronized if their combined consequences are felt at the decisive time and place. (1986, p.17)

As stated above, synchronization is the arrangement of battlefield activities in time, space, and purpose to produce maximum relative combat power at the decisive point. In regard to battlefield activities, the FM describes synchronization in a discussion of activities which includes concentration of forces, massing of fires, interdiction with maneuver, and shifting of reserves, stating the following:

While themselves [activities] separated in time and space, however, these activities are synchronized if their combined consequences are felt at the decisive time and place. (p. 17)

FM 100-5 does not define nor provide a complete list of battlefield activities. It does list seventeen major functional areas that must be coordinated at the tactical and operational levels.¹

FM 100-5 does not present a synchronization model, but does establish the fact that time and space are inextricably linked to the arrangement of activities. How

the arrangement of activities is accomplished is not clearly stated in the manual. Activities are not defined nor are they grouped into major areas. FM 100-5 provides a list of functional areas that could be used to group battlefield activities, but this is not stated in the manual.

FM 100-15, *Corps Operations* (Nov., 1988), does not provide a synchronization model, but does provide a structure for the grouping of activities. It lists seven major operating systems "...which the Corps must synchronize." (p. 3 through 11 [Emphasis added by the author]). It continues by stating "The operating systems, which include command and control as a system, provide a structure for integrating and synchronizing critical combat activities on the battlefield." (p. 3-12)

The corps manual implies that there are critical combat activities subordinate to the seven major functions which must be synchronized by the corps, but does not list any activities during the discussion of the battlefield operating systems (BOS) with the exception of special reconnaissance missions.² In the discussion of special reconnaissance it refers to them as "...intelligence collection activities." (p. 3-53). It does not elaborate on how activities are related to one another or how they are linked to time. FM 100-15 provides a detailed discussion of the considerations for the seven functions (battlefield operating systems) in the execution of close, deep, and rear operations. It discusses not only the seven functions

mentioned above, but fourteen additional functions grouped within the original seven.³

FM 100-15 provides an employment matrix which links combat functions to close, deep and rear operations but does not further link these functions to time or space. (App.B-1 through B-8) Chapters 5 and 6 of FM 100-15 discuss synchronization of Corps offensive and defensive operations. The manual states that in the discussion it will use the operating systems and the battlefield framework as a planning guide, but cautions that this method is only one way of discussing synchronization. Nowhere in these chapters is time and space related to the BOS or the framework of the battlefield. Likewise, there is no discussion of activities or an attempt to relate activities to time and space. No matrix is employed to help the reader visualize how the BOS and the battlefield framework are linked to time or to activities. (pp. 5-36 thru 5-50 & 6-24 thru 6-39) The FM has an entire appendix dedicated to planning factors, but does not define the term "planning factors" or relate their use to the synchronization process.⁴

The latest draft of FM 71-100, *Division Operations*, (November, 1988) states:

The division commander must coordinate the following operating systems and synchronize their activities in time, space and purpose... (p. 1-21 [Emphasis added by author]).

FM 71-100 lists and discusses seven operating systems which are the same as those listed in the Corps manual.

Like the Corps manual, it implies that there are subordinate activities to the BOS which must be synchronized but does not list any activities.* It also mentions NBC operations, describing it as a condition of warfare. (p. 1-28) FM 71-100 provides an example of offensive and defensive employment matrices which link some of the major operating systems to close, deep and rear operations. It does not provide a synchronization model, a planning matrix, nor does it link the BOS or activities to time or to any anticipated event. (pp. 4-29 thru 4-32 and 5-7 thru 5-9)

FM 71-3, *Armored and Mechanized Brigade Operations*, (May, 1988) states:

Synchronization of the operating systems occurs vertically from corps and divisions through brigade to battalion and separate company. It also occurs horizontally among the staff sections. Major considerations for integration of the operating systems in offensive operations follow. (pp. 3-3 and 3-4 [Emphasis added by the author]).

FM 71-3 lists ten operating systems which are different from those listed in the corps and division manuals. Unlike the higher echelon manuals, FM 71-3 does not include maneuver in the operating systems. It also states that the operating systems themselves are synchronized rather than activities subordinate to them.*

FM 71-3 provides a brigade synchronization matrix that links some events, missions, and priorities to close, deep, and rear operations, however, there is no apparent link between these events, missions, or priorities and there is no link to time. Since the FM provides no method to link

these events to time and space, it is difficult to understand how the author believed that the diagram he used was an example of '...what offensive synchronization looks like at the brigade level'. (pp. 3-8 and 3-9).

FM 71-3 does not define or mention any activities related to the operating systems. There is no planning model provided which explains how the battlefield operating systems are synchronized.

FM 71-2, *The Tank And Mechanized Infantry Battalion Task Force*, groups TF functions into seven battlefield operating systems.

FM 71-2 states that these functions must be integrated to support the commanders intent.⁷ Further, it states:

The functioning of each system requires the coordinated efforts of all elements of the task force. The commander and staff integrate these systems into a combined arms force tailored to the situation. (p. 1-10).

The list of operating systems (or functions) in FM 71-2 is identical to the corps and division lists, but is not the same as the list in the brigade manual. Activities are neither discussed nor defined for the TF commander. No model is presented nor is there a matrix included in the manual to help the commander teach the synchronization process to his subordinates.

FM 71-1, *Tank and Mechanized Infantry Company Team*, (22 November, 1988) discusses synchronization as it applies to the company team in the following manner:

Synchronization arranges actions in time and space to produce maximum relative combat power at the decisive point. This requires careful timing; timing requires teamwork. Teamwork is particularly important at company level. Establish SOPs and train until everyone knows and understands them. Rehearse drills and other tactical techniques until they can be completed precisely and automatically. (p. 1-2)

The FM describes time as the critical factor affecting planning and execution. In a detailed discussion of time, *FM 71-1* provides a time and distance formula which can be used to calculate movement times for friendly and enemy forces. It does not use the BOS to group activities, but uses instead the elements within the company team. Rather than discussing activities, it talks in terms of tasks and directs that the company commander consider how long each task should take relative to the enemy situation. (p. 2-23) To arrange the tasks, the manual suggests an execution matrix which can be used to schedule friendly events and tasks. (p. 2-11)

FM 71-1 does not provide a complete process for arranging activities but does provide a method of converting some tasks to time which can be arranged with other timed tasks (activities).

Based on this brief review of the tactical maneuver doctrine from the capstone doctrine to the company commander's doctrinal reference, it is readily apparent why the U.S. Army is confused about what synchronization is and how to accomplish it.

First, there is no synchronization model or process provided in any of the doctrinal manuals. Second, there is

no common definition of battlefield activities in our doctrine and consequently no list of activities relevant to each level of command. Third, since the term 'battlefield activities' was not defined, there is no common grouping of activities between the doctrinal publications. It appears that the BOS should provide the framework for the major grouping; however there is no common list of the BOS in the doctrinal manuals.

For example, *FM 100-5* refers to its list of activities as functional areas. *FM 100-15* lists seven operating systems (generally known as the BOS) which the corps must synchronize, but then immediately describes how they are integrated into the combined arms fight.

The division manual, *FM 71-100*, also has a list of operating systems. Although the division list is identical to the corps initial seven, there is some question as to which subordinate functions are important at division level. The division manual does not list the other 14 functions listed in the corps manual.

The reader of U.S. Army Doctrine cannot help becoming confused regarding synchronization. The term BOS is confused within our doctrine. At each level we do something different to the BOS--synchronize, coordinate, or integrate. The BOS contains subordinate activities which are also called TF functions. No where are either of these terms defined. *FM 71-3* states that the ten systems are synchronized. *FM 71-100* and *FM 100-15* both state that the

BOS activities are synchronized. The list of BOS contained in *FM 71-3*, does not include maneuver. *FM 71-2* states that the seven battlefield operating systems contain TF functions rather than activities-and that these functions are integrated to support the commander's intent. Finally, *FM 71-1* fails to address the BOS or functions at all and likewise does not talk in terms of activities, it discusses tasks which must be reduced to time.

Another major factor contributing to the confusion is the absence of common planning factors or a definition of the term 'planning factor' in the hierarchy of doctrinal maneuver manuals. *FM 101-5-1, Operational Terms and Graphics* (1 October, 1985) defines planning factors as:

A consideration or a multiplier used in planning to estimate the amount and type of effort involved in a contemplated operation. Planning factors are often expressed as rates, ratios, or lengths of time. (p. 1-55).

Without planning factors, it is difficult to convert activities to time. Time seems to be the one common denominator in the synchronization process. Only *FM 100-15* addresses planning factors, and it fails to relate their use to any synchronization methodology. As a result, only *FM 71-1* relates activities (tasks) to time and space but does not do so as a planning factor consideration.

Review of Other Doctrinal Literature

The tactical maneuver doctrinal manuals do not clarify the definition of synchronization; they confuse and

obscure it. The search for clarification must be expanded to other doctrinal literature to help identify the process mentioned in *FM 100-5*. A review of some of the other doctrinal literature reveals the following:

Field Manuals

FM 34-1, Intelligence and Electronic Warfare Operations, (July, 1987) is the capstone manual for the employment of intelligence assets. This manual does not address synchronization at all. It points out that "...[Intelligence and Electronic Warfare] IEW elements and [Military Intelligence] MI units, in particular, are the key to seeing and controlling the battlefield." (p. 8-0, [Clarification provided by the author]), but fails to address how this critical function is arranged in time, space or purpose with any other activity or function on the battlefield. The manual does provide a planning range for the employment of intelligence collection assets at the battalion level but does not link this capability/limitation to time."

In contrast, the capstone manual for fire support, *FM 6-20, Fire Support In The Airland Battle* (May, 1988), addresses synchronization of fire support in great detail. *FM 6-20* states:

In terms of fire support, it (synchronization) is the precise arrangement of coordinated activities in time, space, and purpose to produce the most effective fires. ...The artillery force commander synchronizes the fire support system....Synchronization must occur within the fire support system itself and also with other

battlefield operating systems such as maneuver, command and control, air defense, intelligence, mobility and survivability, and combat service support....The key ingredient stems from the commander's initial visualization of his mission objectives and how specific actions must be sequenced and timed to achieve them.(p. 1-3 [Emphasis added by the author]).

FM 6-20 states that "a fire support synchronization methodology can be found in the decide, detect, deliver approach to targeting and battle management." (p. 3-3), and that this methodology helps the maneuver commander avoid overloading the fire support system by establishing clear priorities.⁹ In addition, it discusses how the fire support estimate and the estimates from other staff sections are linked together to produce a synchronized plan.¹⁰ *FM 6-20* does not list or define the term activities, rather, it uses the term specific actions to describe what the commander must sequence. No methodology or model is discussed for the arrangement of all battlefield activities, but the decide, detect, deliver methodology is used for the synchronization of fires.

FM 100-103, Army Airspace Command and Control In A Combat Zone (October, 1987), addresses synchronization as it pertains to the third dimension of the battlefield. Like *FM 6-20*, it states that the end result desired by the commander is where synchronization begins. *FM 100-103* describes the objective of A²C².

A²C² maximizes joint force effectiveness by ensuring the concurrent employment of airspace users, synchronized in time, space, and purpose to produce maximum combat power at the decisive point.(p. 1-2)

FM 100-103 refers to fire support activities in

relation to aircraft activities but does not define the term activities. It states that the location of the fire support systems on the ground and firing activities of batteries are provided to the A²C² element so that the airspace can be coordinated. (p. 1-6) Coordination is described as: "the adjustment of activities to one another, is a primary requirement for synchronized operations, as is concentration, the application of combat power at a specific place and time." (p. 1-2)

This manual does not provide a model or process for the arrangement of activities and does not reduce activities to time or explain the relationship of battlefield activities to time and space. It does provide a lengthy list of airspace users, and addresses the relationships between the various echelons of the A²C² structure in detail.

FM 63-2, Combat Service Support Operations-Division (Nov, 1983), repeats the definition of synchronization as previously described in the 1982 version of *FM 100-5, Operations*. The manual does not define activities, provides no structure for grouping activities, and provides no process or model to help arrange activities in time, space, or purpose.

FM 5-100, Engineer Combat Operations (November, 1988), states that "synchronization is the orchestration of activities in time, space, and purpose to produce the maximum combat power at the decisive point." (p. 7 [Emphasis

added by the author.] It lists five primary engineer functions with subordinate tasks grouped under each one.¹¹ Throughout *FM 5-100*, engineer employment is discussed in terms of tasks which must be accomplished rather than activities. The manual does not discuss engineer activities in relation to other activities on the battlefield, it provides no list of activities, nor does it provide a model for arranging or grouping activities in time, space, or purpose.

FM 44-1, U.S. Army Air Defense Artillery Employment (May, 1983), discusses synchronization in the same terms as the 1982 version of *FM 100-5*. (p.2-3) It does not discuss activities, provides no model for the arrangement of activities, and does not relate ADA activities to other activities on the battlefield.

FM 44-100, U.S. Army Air Defense Operations (Final Draft) (July, 1988) discusses air defense as one of the seven operating systems. It lists seven battlefield operating systems which are generally the same as those listed in the maneuver manuals; however, this FM includes electronic warfare with intelligence.¹² *FM 44-100* states in part that the BOS provide a structure for integrating and synchronizing critical combat activities on the battlefield but in the same paragraph discusses how commanders use the available command and control system to control the functions of the BOS. (p. 1-2) Neither activities nor functions are discussed in further detail, however the FM

does discuss 'tasks of execution'. (p.5-14) Whether or not these are the activities of the BOS referred to earlier in the manual is not stated. FM 44-100 does not provide a matrix to assist in the discussion of synchronization, nor does it demonstrate how all seven operating systems are synchronized in time, space, or purpose.

FM 1-100, Army Aviation in Combat Operations (August, 1988) states there are eight... 'combat functions and activities' that must be synchronized during aviation operations... (p. 3-28 [Emphasis added by author]). The combat functions and activities mentioned are not related to the BOS, and are generally major operations in and of themselves which contain numerous tasks. There are no subordinate activities or tasks listed or any way to distinguish between combat functions and activities.¹³

FM 1-100 provides no synchronization matrix, nor does it mention the operating systems described in *FM 71-100*. There is no methodology described in this FM and there is no group of activities that impacts on aviation operations.

FM 6-20-10/FM 34-118, The Targeting Process (February, 1988), jointly developed by the Intelligence Center and the Fire Support Center, links the decision support template (DST) to the battlefield functions as a means of recording when high payoff targets should be engaged provided the intelligence collection asset is available to verify or deny the anticipated enemy is in the target area.

This manual links time with a specific activity, for example: firing an artillery concentration at a high payoff target which is then related to space and arranged with another activity, intelligence collection. (pp. 2-6 thru 2-8)

FM 101-10-1/2, Staff Officers' Field Manual

Organizational, Technical, and Logistical Data Planning Factors (Volume 2) (October, 1987), provides some planning factors for combat engineer operations and some combat service support (CSS) activities. This manual reduces selected activities to time and provides planning factors for the activities it describes which can be used for converting activities to the common battlefield denominator of time.

This review of other doctrinal literature shows that activities are not uniformly defined and there is no clarification of the definition for synchronization. Some of the doctrinal literature fails to address the term 'activities' at all. No doctrinal manual examined to this point in the study has clearly identified a process for arranging activities in time, space, or purpose. It appears that the confusion of terms discovered in the tactical maneuver doctrine is only made more confusing by the other doctrinal literature. The search for a process to assist in defining the term 'activity' and for a process to help arrange activities will now be expanded to other military sources.

Other Military Sources

TC 34-130, Intelligence Preparation of the Battlefield (December, 1987), discusses eight operational factors normally considered at the tactical level. These operational factors are similar to the BOS, but also have minor differences. (Note 1, p. 128) The operational factors are used to help develop the decision support template.

In discussing the decision support template (DST), this manual states that the DST can be developed with decisions keyed to an operational factors matrix. It is the first manual that does provide a model with a way of linking time and space to the major grouping of activities known as the BOS. (Note 1, pp. 129 & 136)

TC 34-130 refers to the operational factors as battlefield functions. Because the operational factors matrix is directly linked to the maneuver graphics on the operations overlay, space considerations are accounted for. What is not made clear are the activities within each of the battlefield functions or how they are reduced to time.

Both *TC 34-130* and *FM 6-20-10* provide a basic model for arranging functions, but neither defines activities subordinate to those functions or the battlefield operating systems.

TRADOC Pam 11-9, Blueprint of the Battlefield (July, 1988), was designed primarily as an analytical tool.

The Blueprint is a descriptive tool that provides a basis for describing Army requirements, capabilities, and combat activities at the tactical level of war. (Note 2 p. 1-1)

The Blueprint lists seven battlefield operating systems which:

originated from commanders' needs to conveniently categorize aspects of field operations for training and evaluation purposes. The BOSs are now a central feature of training evaluation as described in FM 25-100, [Training the Force]. (Note 2 p. 2-3)

The Blueprint, unlike any of the preceding manuals, sought to identify tasks which are also called activities subordinate to each of the Battlefield Operating Systems.

The Blueprint of the Battlefield is a hierarchical structure of combat functions and tasks that provides a standard reference for the description and analysis of a force's activities while engaged in conflict. (TRADOC Pam 11-9, July, 1988, p. 2-1 [Emphasis added by the author])

Although it was designed strictly for analytical purposes as opposed to providing a solution to the problem of synchronization, it does provide a starting point for the identification of activities grouped under the battlefield operating systems. However, no attempt was made to establish the interrelationship between timed standards for the subordinate tasks and the arrangement of those subordinate tasks in space or purpose. (Note 2, p. 2-6)

A brief examination of some doctrinal publications which predated World War Two indicates that during the late 1930's, the U.S. Army did pay attention to the amount of time required to execute specific activities.

Attack (1937) discusses the time of attack in relation to the enemy's capability to counter it, which was based on the enemy's present position, distance from the point of decision, rate of march, and time required to

execute the activity (attack). This manual lists several subordinate tasks and refers to them as activities, all of which were timed events. The portion of this manual which discusses activities addresses it in explaining the need for coordinating the attack. (Note 3, p. 25)

Combat Orders (1937) discusses the commander's estimate of the situation and directly relates time and space considerations to the development of courses of action and the command estimate of the situation. (Note 4, pp. 19-25)

In a training note to his subordinate battalion commanders, LTG Bruce Clark posed several questions which he believed were important in the successful planning of an attack. One question he asked specifically relates to the thesis question regarding time and space. 'Have I determined the 'time and space' factors of attacking units from the Line of Departure (LD) back to the assembly area(s) to insure that everything is set to go when units arrive on the LD?' (Note 5, p. 5)

Many of General Clark's questions require that activities be reduced to time in order for an answer to be formulated. This document is basically a long list of key questions a commander must ask himself during the wargaming process. It provides some ideas related to what activities are relevant at the Battalion task force level. (Note 5)

Combined Arms Assessment Team After Action Report
Rotation 86-7, (March 1986), a focused rotation on command

and control, addressed the synchronization function of the Tactical Operations Center (TOC). The author states in part the following:

The commander who is usually involved in controlling the close-in battle, cannot "see" the overall picture of the battlefield that is necessary to ensure these activities occur on schedule. He must depend on the [tactical operations center] TOC to develop this picture and relay it to him. This implies that the TOC monitors the synchronization of combat power that the commander planned for prior to execution. (Note 6 p. 20)

Although this is not a doctrinal manual, it clearly states that commanders must synchronize activities in the planning process, but may require assistance in the execution phase. Included in this document is a synchronization matrix which "can assist the [tactical operations center] TOC [second in command] (2IC) in tracking critical activities by serving as a checklist for both the planning and execution phases of the operation" (Note 6 p. 10 [Clarification added by the author]).

The synchronization matrix provided in the example lists some of the activities which should be planned, however, it is more an estimate of when activities should occur rather than a consistent time-lined record of the anticipated battlefield events and activities. In addition, as demonstrated in figure 2-1, it fails to show relationships between major events or between the seven operating systems. (Note 6, pp. 20-22)

FIGURE 2-1

Planning/Execution Matrix (Synchronization)

(attachments)
LOCATION SCT ARTY CAS AH SMOKE MORTAR FASCAM
 TIME

* Employment of:

EST

ACTUAL Current Future

	LD		
	PL 1		X
Atk Pos	PL 2		
	PL3		
	OBJ	X	
	PL 1		
LD	PL 2		
	PL3		
	OBJ		
	PL 2		
PL 1	PL 3		
	OBJ		
	PL 2		
PL 2	PL 3		
	OBJ		
	PL 3		
PL 3	OBJ		
	OBJ		

NOTES: (Guidance)

1 - Smoke (E-O) for 30 min prior to LD

(REPRODUCED FROM CAAT AAR ROTATION 86-7, p. 10)

LTC Jack A. LeCuyer and 1LT Alan R. Anderson published a document entitled *Synchronization* (1986) which described in great detail how intelligence preparation of the battlefield (IPB) is related to the synchronization process in planning. Although the document was well written, it failed to answer the question regarding identification of activities at any force level. The

document does a fine job of explaining how the IPB process can help the planner determine possible enemy courses of action and enemy decision points, but does not further link this to the myriad of other activities necessary for successful combat planning. (Note 7)

The review of these other sources provides several thoughts related to the problem of identifying a synchronization process. Although they have not specifically defined a process, they provide a foundation for answering the questions presented in chapter one. In the next chapter, several definitions will be presented which will help clarify synchronization. Additionally, a synchronization model and matrix based upon the preceding review of literature will be proposed.

REFERENCE NOTES CHAPTER TWO

1. TC 34-130, *Intelligence Preparation of the Battlefield, Coordinating Draft*. Ft. Huachuca, Arizona, December, 1987.

TC 34-130 lists the following eight operational factors which must be considered at the tactical level. Note they are very similar to the BOS listed in the corps and division manuals.

1. INTELLIGENCE
2. MANEUVER (INCLUDING AVIATION)
3. FIRE SUPPORT
4. AIR DEFENSE ARTILLERY
5. MOBILITY/COUNTERMOBILITY/SURVIVABILITY
6. NUCLEAR, BIOLOGICAL, AND CHEMICAL
7. COMBAT SERVICE SUPPORT
8. COMMAND AND CONTROL

2. TRADOC PAM 11-9, *Blueprint of the Battlefield*. Ft. Monroe, Virginia, July, 1988.

The seven operating systems detailed below are also referred to as functions in the TRADOC PAM. These BOS are now the central feature of FM 25-100, *Training the Force*, but the function of the BOS in TRADOC Pam 11-9 is not training but rather for analytical use.

1. MANEUVER
2. FIRE SUPPORT
3. AIR DEFENSE
4. COMMAND AND CONTROL
5. INTELLIGENCE
6. MOBILITY AND SURVIVABILITY
- COMBAT SERVICE SUPPORT

3. *Attack*, {Tentative}. 1937.

This is a 1937 field manual located in the archive section of the Command and General Staff College library.

4. *Combat Orders*. 1937.

A 1937 field manual located in the archive section of the Command and General Staff College library.

5. LTG Bruce C. Clark, *The Planning of Battle Group and Battalion Attacks*. HQ Seventh United States Army, 3 September, 1957.

This is a 1957 training letter which can be located in

the archive section of the Command and General Staff College library.

6. *Combined Arms Assessment Team After Action Report*
Rotation 86-7. March 1986.

Document contains a matrix p. 10 and discussion pp. 20-22. This after action report is available through the Combined Arms Training Activity, Fort Leavenworth, Kansas.

7. LeCuyer, J. A. LTC & Anderson, A.R. 1LT (P).
Synchronization. 1986.

Monograph published by LTC Jack A. LeCuyer and 1LT(P) Alan R. Anderson while on staff at the Engineer Center, Fort Belvoir, Virginia. A reference copy of this document is available through the author.

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- Headquarters, Department of the Army, Washington, DC, *FM 63-2, Combat Service Support Operations-Division*. 21 November, 1983.
- Headquarters, Department of the Army, Washington, DC, *FM 71-1, Tank and Mechanized Infantry Company Team*. 22 November, 1988.
- Headquarters, Department of the Army, Washington, DC, *FM 71-2, Tank and Mechanized Infantry Battalion Task Force*. June, 1988.
- Headquarters, Department of the Army, Washington, DC, *FM 71-3, Armored and Mechanized Brigade Operations*. May, 1988.
- Headquarters, Department of the Army, Washington, DC, *FM 71-100, Division Operations, Approved Final Draft*. 15 November, 1988.
- Headquarters, Department of the Army, Washington, DC, *FM 100-5, Operations*. 5 May, 1986.
- Headquarters, Department of the Army, Washington, DC, *FM*

100-15, Corps Operations, Final Draft. 15 November, 1988.

Headquarters, Department of the Army, Washington, DC, *FM*
100-103, Army Airspace Command and Control in a Combat
Zone. 7 October, 1987.

Headquarters, Department of the Army, Washington, DC, *FM*
101-5-1, Operational Terms and Symbols. 21 October, 1985.

Headquarters, Department of the Army, Washington, DC, *FM*
101-10-1/2, Staff Officers' Field Manual Organizational,
Technical, and Logistical Data Planning Factors (Volume
2). October, 1987.

ENDNOTES CHAPTER TWO

¹. *FM 100-5*. May, 1986, p. 40. The functional areas listed in *FM 100-5* are not linked directly to activities, but they could be used to group activities. The seventeen functional areas follow:

1. MANEUVER
2. CONVENTIONAL, NUCLEAR, AND CHEMICAL FIRES
3. INTELLIGENCE
4. TACTICAL AIR OPERATIONS
5. JOINT SUPPRESSION OF ENEMY AIR DEFENSE
6. ENGINEER SUPPORT
7. AIR DEFENSE
8. COMMUNICATIONS
9. AIRSPACE COORDINATION
10. DECEPTION
11. ELECTRONIC WARFARE
12. RECONSTITUTION
13. PSYCHOLOGICAL OPERATIONS
14. AMPHIBIOUS OPERATIONS
15. SPECIAL OPERATING FORCES
16. CIVIL MILITARY OPERATIONS
17. LOGISTICS

². *FM 100-15, Corps Operations, Final Draft*. 15 November, 1988, p. 3-12. *FM 100-15* provides the following list of seven major operating systems and states that they provide a structure for integrating and synchronizing critical combat activities on the battlefield. Their activities are not defined or listed within the manual.

1. MANEUVER
2. MOBILITY/COUNTERMOBILITY/SURVIVABILITY
3. FIRE SUPPORT
4. AIR DEFENSE
5. INTELLIGENCE
6. COMBAT SERVICE SUPPORT
7. COMMAND AND CONTROL

³. *FM 100-15, Corps Operations, Final Draft*. 15 November, 1988, p. 3-12 thru 3-60. *FM 100-15* lists these additional 14 functions in its discussion of the major operating systems:

- (8) CAVALRY
- (9) AVIATION
- (10) FAMILY OF SCATERABLE MINES (FASCAM)
- (11) ELECTRONIC JAMMING
- (12) TACTICAL AIR
- (13) ARMY/AIR FORCE COORDINATION
- (14) NUCLEAR AND CHEMICAL WEAPONS

- (15) J-SEAD
- (16) SPECIAL OPERATING FORCES
- (17) DIRECT ACTIONS
- (18) UNCONVENTIONAL WARFARE
- (19) FOREIGN INTERNAL DEFENSE
- (20) PSYCHOLOGICAL OPERATIONS
- (21) CIVIL AFFAIRS OPERATIONS

4. *FM 100-15, Corps Operations, Final Draft.* 15 November, 1988, pp. A-3 through A-50. Planning factors are referenced in the corps manual and are listed in an appendix, but their use is not related to time or space considerations, nor are they related to one another.

5. *FM 71-100, Division Operations, Approved Final Draft.* 15 November, 1988, p. 1-21. The seven operating systems listed in *FM 71-100* are identical to those listed in *FM 100-15* and both manuals refer to their list as the seven operating systems. As the reader can see, the division manual does not include all the subordinate elements discussed in the corps manual.

- 1. MANEUVER
- 2. MOBILITY, COUNTERMOBILITY, AND SURVIVABILITY
- 3. FIRE SUPPORT
- 4. AIR DEFENSE
- 5. INTELLIGENCE
- 6. COMBAT SERVICE SUPPORT
- 7. COMMAND AND CONTROL

6. *FM 71-3, Armored and Mechanized Brigade Operations, Draft.* May, 1988, pp. 3-3 thru 3-7. The operating systems listed in *FM 71-3* are different from those listed in the corps and division manuals. It is interesting to note that all three manuals call their list the operating systems but none of the lists are exactly the same. Unlike the higher echelon manuals, *FM 71-3* does not include maneuver in its list. In addition, *FM 71-3* states that the operating systems themselves are synchronized rather than subordinate activities as implied in *FM 100-15* and *FM 71-100*. The operating systems listed in *FM 71-3* follow:

- 1. INTELLIGENCE
- 2. AVIATION
- 3. FIRE SUPPORT
- 4. AIR DEFENSE ARTILLERY
- 5. MOBILITY/COUNTERMOBILITY
- 6. NUCLEAR, BIOLOGICAL, CHEMICAL DEFENSE
- 7. COMBAT SERVICE SUPPORT
- 8. COMMAND AND CONTROL
- 9. MILITARY POLICE
- 10. COMMUNICATIONS

7. *FM 71-2 The Tank and Mechanized Infantry Battalion Task Force.* June, 1988, pp. 1-10 thru 1-13. The seven operating systems listed below are also called functions in the battalion TF manual. Rather than using the word synchronize or coordinated, *FM 71-2* uses the term integrated. It is unclear what the difference is between these terms in the various doctrinal manuals.

1. COMMAND AND CONTROL
2. MANEUVER
3. FIRE SUPPORT
4. INTELLIGENCE
5. AIR DEFENSE
6. MOBILITY, COUNTERMOBILITY, SURVIVABILITY
7. COMBAT SERVICE SUPPORT

8. *FM 34-1, Intelligence and Electronic Warfare Operations.* 2 July, 1987, p. 2-25. The chart depicted on the referenced page demonstrates intelligence collection range capabilities superimposed over an echeloned soviet regiment in the attack.

9. *FM 6-20, Fire Support in the AirLand Battle.* 17 May, 1988, p. 3-3. This small FM describes the decide, detect, deliver methodology on the referenced page. The methodology described is consistent throughout FA doctrinal manuals, and is consistent with Intelligence Center field circulars.

10. *FM 6-20, Fire Support in the AirLand Battle.* 17 May, 1988, pp. 3-7 through 3-11. The FM does not go through a step by step process for reducing activities to time, but does state the importance of timing and coordination with the other staff elements.

11. *FM 5-100, Engineer Combat Operations.* 22 November, 1988, p. 9. The five primary functions of engineers include mobility, survivability, countermobility, sustainment engineering, and topographic engineering. The table on page 9 of *FM 5-100* shows the five functions with subordinate tasks grouped under each.

12. *FM 44-100, U.S. Army Air Defense Operations (Final Draft).* July, 1988, p. 1-2. The seven BOS included in this draft version of the Air Defense capstone manual are:

Maneuver
Fire Support
Air Defense
Intelligence and Electronic Warfare
Combat Service Support
Mobility, Countermobility, and Survivability
Command and Control

The manual is much improved over the 1983 version of FM 44-1, however the inconsistency in terms noted in most of the other doctrinal manuals is present in this draft as well.

¹³. *FM 1-100, Army Aviation In Combat Operations*. August, 1988, p. 3-28. The eight combat functions and activities listed in *FM 1-100* include:

1. MANEUVER OF AIR AND GROUND UNITS
2. SHIFTING OF SUPPORTING FIRES
3. PASSAGE OF LINES
4. AIR ASSAULT OPERATIONS
5. JOINT OPERATIONS, INCLUDING JAAT, J SEAD, AND J-SAK
6. CLOSE AIR SUPPORT
7. AIRSPACE MANAGEMENT
8. TACTICAL AIR DEFENSE OPERATIONS

CHAPTER THREE

A Proposed Synchronization Planning Model and Matrix

A Proposed Synchronization Planning Model

The review of literature has demonstrated that U.S. Army tactical maneuver doctrine is replete with inconsistencies in terminology regarding the subject of synchronization. In addition, no complete synchronization model can be identified within existing doctrine. There are, however, several pieces of a model which can be assimilated into a coherent product. The following is a synchronization planning model which is derived from the doctrinal manuals and other publications examined during the review of literature.

The first step in describing the synchronization planning model requires an understanding of synchronization as discussed in *FM 100-5, Operations*.

Synchronization is the arrangement of battlefield activities in time, space, and purpose to produce maximum relative combat power at the decisive point. (*FM 100-5*, 5 May, 1986, p. 17)

Several key terms contained in this definition of synchronization which require amplification are arrangement, battlefield activities, time, space, and purpose. Three other terms which require definition are battlefield operating systems, planning factors, and battlefield framework.

Purpose is the first and most important word in the definition of synchronization, because purpose is the end

result desired. Purpose may be defined as the mission and commander's intent. Synchronization begins in the mind of the commander but is expressed to others in the form of a concept statement.

The term battlefield activities has not been specifically defined in doctrine, however, the following definition appears to be supported by the current doctrine:

A task, event, procedure or group of procedures which can be reduced to time.¹

In addition, the term Battlefield Operating Systems (BOS) has been defined in military doctrine (FM 100-15) as it pertains to synchronization. It is used extensively in virtually every doctrinal tactics manual from corps down to battalion, but is not consistently applied nor are the Battlefield Operating Systems standard throughout doctrine. For the purpose of clarity in this model, BOS is defined as:

Seven battlefield functions which serve as a common base for the grouping of subordinate combat activities.²

The seven battlefield functions listed in a logical planning sequence are:

- (1) Intelligence
- (2) Maneuver
- (3) Mobility/Counter mobility/Survivability
- (4) Fire Support
- (5) Air Defense Artillery
- (6) Command and Control
- (7) Combat Service Support

Time appears to be a critical element in the discussion of synchronization. This is true because all activities, both friendly and enemy will require this resource and both friendly and enemy forces will be

constrained by time. Movement across space can easily be converted into time and all other activities can likewise be converted because every activity requires time to accomplish. Accepting this as a common foundation for the synchronization process, a method must be determined which helps reduce all activities to the one common denominator of time. One method of accomplishing this is through the use of planning factors. Planning factor may be defined as:

A consideration or a numeric value used in planning to estimate the amount and type of effort involved in a contemplated operation. Planning factors are often expressed as rates, ratios, or lengths of time.³

Activities may become planning factors once the activity is converted into time. Planning factors may be increased or decreased based on the level of training a unit has achieved, its morale, the current situation or other variables which only the commander or a well trained staff officer can evaluate.⁴

Virtually every doctrinal manual examined discusses modern battle in relation to close, deep, and rear operations. At least three doctrinal manuals discuss battlefield activities in relation to the battlefield framework as described in *FM 100-5, Operations*.⁵ The term battlefield framework is defined in *FM 100-5* as:

(a) Offensive framework consisting of:

- (1) Deep operations
- (2) Reconnaissance and security operations
- (3) Main and supporting attack
- (4) Reserve operations
- (5) Rear operations

(b) Defensive framework consisting of:

- (1) Deep operations
- (2) Security operations
- (3) Defensive operations in the Main Battle Area (MBA)
- (4) Reserve operations
- (5) Rear operations

Space, is the terrain which is encompassed by the battlefield framework. All battlefield activities will occur within the battlefield framework, and all activities will require time. If the activity is movement across space, time is involved.

Now that the key definitions have been provided, the next step involves the actual arrangement of the battlefield functions and their subordinate activities in a logical, progressive manner that can be employed while constructing a battle plan.

To demonstrate this process, a matrix will be constructed that shows the relationship of the battlefield operating systems to one another. The final matrix will be the basic format for use in the synchronization planning process.

Although the matrix and considerations for synchronization appear to be accomplished one at a time, many of the staff activities described will occur simultaneously in the planning process. The sequential process which follows is designed to help the reader understand the command and staff relationships involved in the synchronization planning process. In addition, it should be pointed out that the matrix demonstrated throughout the remainder of this thesis would be much larger in size if actually employed. A publication limitation requires the matrix be reduced to the size demonstrated in this thesis.

A Proposed Synchronization Planning Matrix

When analyzing the mission provided by the higher headquarters, it is important to determine the amount of time available and establish a standard time-line between enemy and friendly activities. The time-line is provided through a determination of how much time is available before the operation must commence, and is expanded in time to account for the execution phase of the operation.⁶ The IPB process provides information on the enemy's possible courses of action and assists the commander in determining the appropriate amount of time available for planning and execution.⁷

The commander is the critical participant in the synchronization process because he must provide focus for the staff in the synchronization effort. When the commander receives the mission, he will analyze the situation and determine time available. He will also form a concept of operation based upon his knowledge of the situation and will issue planning guidance to the staff along with his initial concept. This critical step will speed the synchronization process because it immediately focuses the effort of the entire staff who are working to minimize the amount of time required for planning so more time can be devoted to preparation and execution.

The initial portion of a synchronization planning matrix which would help demonstrate the first two considerations of time and enemy courses of action would

look like Figure 3-1.

Figure 3-1

Time-Line and Enemy Courses of Action

	H-4	H-HOUR	H+1	H+2	H+3	H+4	H+5	H+6
TIME-								
LINE	000001	000400	05	06	07	08	09	10
I								
N	EC							
T	NO							
E	A							
L								

The time-line may be in actual hours or in an H-hour sequence. The starting point and ending point of the time-line is based upon how much planning and execution time is available. The initial times arrayed along the time-line are important during the synchronization process to help the commander and staff visualize the battle and also provides a method of recording movements and other timed activities which the commander or staff officer anticipates. For example, if the friendly force is in the defense, the first activities to be time-lined should be the enemy's sequential presentation of forces beginning with his reconnaissance elements and followed by all subsequent anticipated enemy forces. This information is extracted from the IPB product known as the enemy event template.

Since the attacking enemy force initially has the initiative of when and where to attack, the S-2 must use the possible enemy course of action that his commander wishes to consider first as the enemy's most likely course of action.

The S-2 will array the enemy force anticipated below the time he anticipates their arrival at the forward edge of the battle area (FEBA). When considering the enemy's presentation of force, the battlefield functions provide a method of examining all the enemy's combat potential.

For example, under the intelligence function, consider the enemy's reconnaissance elements organic at each level and array them along the time-line when they are anticipated to be employed forward of the attacking first echelon forces. Also anticipate when the enemy will use his long range reconnaissance units.

Next, array his maneuver forces along the time-line when their arrival is anticipated at the forward line of own troops (FLOT). Likewise, array along the time-line the anticipated time he may employ his major artillery concentrations, close air support, jamming capability, and attack helicopters (fire support).

Examine the sector or zone to determine if the configuration of the terrain will influence the enemy commander's ability to alter his course of action. This process of fitting the enemy's movement to the ground and projecting enemy decision points is part of the enemy event templating process. After this has been accomplished, project when the enemy commander's major command and control decisions must be made, and plot them appropriately in the enemy course of action block at the time they are anticipated.

When this has been accomplished for the most likely course of action, go back over the enemy course of action and indicate where the enemy may change his array of forces in time, based on the enemy event template.⁸ These points will become points in time and space where the friendly course of action may require modification to address all the enemy's possible options. Friendly actions planned in this manner are called branches to the plan.⁹

After the enemy's anticipated course of action and all possible enemy options have been arrayed below the timeline, the TF commander must then determine his own course of action to defend against the attacking enemy and select where and how he wants to destroy or defeat him. The commander (or his S-3) will determine the TF scheme of maneuver and array his TF teams throughout the framework of the battlefield.¹⁰

The commander or S-3 will estimate how long it takes each subordinate maneuver element to complete planned and anticipated moves on the battlefield relative to the enemy's capability to change attack direction. Based upon this time distance analysis, the commander (or his S-3) will select positions which allow friendly maneuver or repositioning to be executed faster than enemy forces can execute their maneuver options. For each enemy decision point and possible different attack option, the friendly commander will likewise determine his own actions to take advantage of the enemy commander's decision. The friendly force

commander will position intelligence collection assets such that the friendly force can detect enemy actions in sufficient time to permit faster execution than the enemy based on projected movement speeds. Once the time has been estimated for each planned move, the activity of repositioning can be arranged with the corresponding decision point on the matrix.

This time distance study is accomplished for every maneuver element the commander arrays throughout the framework of the battlefield to address enemy forces as they enter the friendly zone or sector. (Figure 3-2)

Figure 3-2

Friendly Course of Action

	E-4	E-3000	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8
TIME	000001	000400	05	06	07	08	09	10	11	12
I	E C									
E	E O									
E	A									
T	TAL (TAMED AREA OF INTEREST)									
E	TAL (TAMED AREA OF INTEREST)									
L	COLLECTION ASSET									
	PTB/12									
E	SEC									
A										
E	H									
E	B									
E	A									
E	RES									
E	DEEP									
E	NEAR									

Once all friendly force movements have been determined and plotted, the remainder of the staff array

their supporting activities in a similar manner based on the commander's guidance and intent. For example, if the commander desires a field artillery concentration to suppress the first echelon battalions of a regiment, the fire support officer (FSO) determines how many artillery tubes are available, how many rounds of ammunition are required to achieve the desired effects, and with the knowledge of the sustained rate of fire of the supporting field artillery battalion, determines how long this firing activity takes and plots the firing activity on the time-line beneath the scheme of maneuver when the activity is expected to occur.¹¹ (Figure 3-3)

Figure 3-3

Fire Support

	F-1	F-2001	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8
TIME	000001	000400	05	06	07	08	09	10	11	12
I	E C									
	E O									
E	A									
T	RAI (RANGED AREA OF INTEREST)									
E	TAI (TARGET AREA OF INTEREST)									
L	COLLECTION ASSET									
	PIR/IR									
U	SEC									
A										
E	H									
E	B									
U	A									
V										
E	RES									
E										
	DEEP									
	NEAR									
F	(DS)									
I										
E	(R)									
E										
	MORTARS									

In a similar manner the FSO can plot how long it would take to fire an artillery delivered FASCAM minefield or achieve a desired level of obscuration with artillery or mortar delivered smoke munitions considering wind direction, speed and atmospheric condition.

Once the FSO has determined how long a given firing activity takes, he can coordinate with the engineer to ensure the obstacle plan will cause the necessary delay of enemy forces to achieve the results desired by the commander.

The engineer officer assists the S-2 in terrain analysis, coordinates closely with the FSO to determine the required delay of enemy forces, and, based on guidance from the commander and S-3, determines the types and general location of obstacles. He then must determine how long it will take to construct the necessary countermobility obstacles and survivability positions which the commander has directed. The engineer knows the digging capability of each digging team, how many teams are available, how long it takes to construct survivability positions and how long it takes to dig a given length of tank ditch with one digging team. Using simple math, he can determine how much of each can be accomplished in the amount of preparation time available. The engineer must additionally factor in the amount of combat service support (CSS) time necessary to sustain his equipment, and the relocation time necessary to accomplish the mission.¹² (Figure 3-4)

FIGURE 3-4

Mobility, Countermobility, Survivability

	S-4	S-4001	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
TIME	000001	000400	05	06	07	08	09	10	11	12
I	S C									
	S O									
E	A									
T	TAI (THREAT AREA OF INTEREST)									
S	TAI (TARGET AREA OF INTEREST)									
L	COLLECTION ASSET									
	PIR/IR									
U	SEC									
A										
S										
E										
U										
V										
E	RES									
S										
	DEPT									
	REAR									
P	(DS)									
I										
E	(R)									
E										
	HOSTAGE									
E	MOB									
S										
O	CH									
E										
	SUB									

The air defense officer working in conjunction with the S-2, S-3, FSO, and air liaison officer (ALO) will assist in the identification of threat air avenues of approach. He will position air defense assets to provide the coverage required by the TF commander. In coordination with the ALO, FSO and S-3, he will help establish airspace coordination areas (ACA's), determine when the local air defense status may require change to facilitate safe operation of friendly

air support, and plots these activities in the appropriate block of the synchronization matrix below the time the ADA activity must occur. If movement of air defense assets is required, he will determine when they must reposition to arrive at the designated location on time, and will note this graphically on the matrix.¹³ (Figure 3-5)

Figure 3-5

Air Defense Artillery

	S-4	S-4002	S-4	S-2	S-3	S-4	S-5	S-6	S-7	S-8
TIME	000001	000400	05	06	07	08	09	10	11	12
I	IC									
	IO									
E	A									
T	TAI (TARGET AREA OF INTEREST)									
E	TAI (TARGET AREA OF INTEREST)									
L	COLLECTION ASSET									
	PIR/IR									
N	SEC									
A										
N	N									
E	B									
U	A									
V										
K	RES									
E										
	DEEP									
	NEAR									
F	(DS)									
I										
R	(R)									
E										
	MORTARS									
V	MOD									
E										
O	CM									
E										
	SUB									
A										
D	STINGER									
A										
	VULCAN									

The S-4 must calculate fuel consumption and estimate

ammunition expenditure rates. He must determine the distance to his resupply points and know how long each resupply activity will take. If the commander wants to refuel several company teams simultaneously, the S-4 must project their fuel status at the time they will need fuel and determine the fuel tanker requirement. If the S-4 has determined during his estimate process that he will have insufficient tankers available to accomplish such a refueling operation, he must plan an alternate means of accomplishing the activity at a different time. Once he has made this determination, he places his resupply activities on the synchronization matrix and determines when each activity must begin so that the TF is adequately sustained.¹⁵ In a similar manner he selects decision points in coordination with the commander and executive officer (XO or 2IC) for the possible relocation of CSS elements based on enemy activities. If the threat to the TF support area is significant enough, he will maintain his elements in a more mobile posture to facilitate rapid relocation. Recovery assets are positioned forward to minimize movement time of combat units to the rear and these CSS planning times will be noted on the synchronization matrix. The CSS activities he will routinely synchronize include man, fix, arm, move, transport, fuel the force, and protect the CSS elements. (Figure 3-6)

Figure 3-6

Combat Service Support

	E-4	E-ROUTE	E-1	E-2	E-3	E-4	E-5	E-6 ^A	E-7	E-8
TIME	000001	000400	05	06	07	08	09	10	11	12
I	E C									
	S O									
B	A									
T	NAI (NAMED AREA OF INTEREST)									
R	TAI (TARGET AREA OF INTEREST)									
L	COLLECTION ASSET									
	PIR/IR									
N	SEC									
A										
E	N									
E	D									
S	A									
V										
E	RES									
B										
	DEEP									
	REAR									
F	(DS)									
I										
R	(R)									
E										
	MORTARS									
E	MGB									
N										
O	CM									
E										
	SUB									
A										
D	STINGER									
A										
	VULCAN									
C	MAN									
S	FUEL									
S	ARM									
	FIX									
	TRANSPORT									
	MOVE									

The commander, XO, S-3, and communications officer must determine where each of the command and control elements will be positioned during the battle and will project their movements in time based upon the distance they

must move and the rate of movement they can achieve. After determining when each element will move during the battle, the information is transferred graphically to the synchronization matrix. Decision points are noted on the matrix and are linked to the appropriate decision maker. It is imperative that command and control functions be clearly defined within the TF. During operations, the repositioning of command and control elements should be timed so continuous command and control of the TF can be maintained.¹⁴ (Figure 3-7)

Figure 3-7
Command and Control

	E-4	E-800R	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8
TIME	000001	000100	05	06	07	08	09	10	11	12
I	E C									
	E O									
E	A									
T	NAI (NAMED AREA OF INTEREST)									
E	TAI (TARGET AREA OF INTEREST)									
L	COLLECTION ASSET									
	PIR/IR									
N	SEC									
A										
E	H									
E	B									
E	A									
V										
E	RES									
E										
	DEEP									
	REAR									
F	(DS)									
I										
E	(R)									
E										
	MORTARS									
E	MIS									
E										
G	CM									
E										
	SUB									
A										
D	STINGER									
A										
	VULCAN									
C	MAN									
S	FUEL									
S	ARM									
	FIX									
	TRANSPORT									
	MOVE									
C	CMD GP									
A										
C	MAIN CP									
	TAC CP									
	DECISION									
	POINTS									

This is a synchronization planning model and matrix designed to cause the TF staff to work together during training and to learn the synchronization planning process. It is not specifically designed to be used as a field model because of the time involved in producing the complete synchronization matrix. A commander who trains his staff to conduct planning and wargaming in this degree of detail does not need to complete a matrix for every operation.

Once the model is completely understood and internalized by all staff officers and subordinate commanders, they tend to synchronize through simple coordination as they will all be thinking, planning, organizing, and executing with the knowledge that each activity involves time-distance analysis. The staff quickly learns that each activity is related to all others and effects all other battlefield functions and activities.

A well trained staff may use the matrix during field operations as a quick reference to assist them when planning time is short. The matrix would assist them by serving as a check list and help them quickly focus on only the most critical activities in a time constrained environment.

This model appears to be a logical method of synchronizing TF activities, but now needs to be applied to a tactical scenario to test its validity. Chapter four of this thesis presents a scenario which provides a basis for the application of the described synchronization model and matrix.

ENDNOTES CHAPTER THREE

¹. *TRADOC PAM 11-9, Blueprint of the Battlefield*. 8 July, 1988. Page 1-1 provides the basis for describing combat activities. *FM 100-15, Corps Operations, Final Draft*, 15 November, 1988, p. 3-12 implies there are activities subordinate to seven major operating systems which must be synchronized. *FM 5-100, Engineer Combat Operations*, 22 November, 1988, p. 9 uses the term tasks to describe subordinate activities.

². *TRADOC PAM 11-9, Blueprint of the Battlefield*. 8 July, 1988. The *Blueprint* uses the BOS to group the battlefield activities. Both *FM 100-15* and *FM 71-100* use the BOS to discuss the grouping of activities. *FM 6-20, Fire Support in the AirLand Battle*, 17 May, 1988, also discusses synchronization relative to the operating systems.

³. Planning factors are defined in *FM 101-5-1, Operational Terms and Graphics*, October, 1985, p. 1-55. Although the term is not related to the definition of activities, a parallel can be drawn between the two in relation to time.

⁴. ARTEPS provide timed standards for several activities on the battlefield. These standards are based on fully trained units. In war, units may be thrown together or may be demoralized due to losses. In this event, the timed standard must be modified.

⁵. *FM 100-5, Operations*, 5 May, 1986, pp. 106 and 137 define the battlefield framework. *FM 100-15* discusses offensive and defensive operations within this construct. *FM 71-100* discusses the battlefield framework in relation to synchronization on p. 4-5 and pp. 5-2 thru 5-3.

⁶. *FM 101-5, Staff Organization and Operations*. 5 October, 1983. This FM discusses how to determine time available.

⁷. *FM 34-1, Intelligence and Electronic Warfare Operations*. 2 July, 1987. *FM 34-1* describes in great detail the templating procedures designed to help determine enemy capabilities and to predict when and where these activities might occur.

⁸. *TC 34-130, Intelligence Preparation of the Battlefield, Coordinating Draft*. December, 1987. Enemy event templating provides a projection of the enemy's possible actions in relation to time and space. pp. 100 - 105.

9. *FM 100-5, Operations*. 5 May, 1986. Pages 98 and 133, discuss branches to plans which allow for rapid transition to an alternative course of action based upon the enemy's actual activities.

10. *FM 100-5, Operations*. 5 May, 1986. Page 137 discusses the battlefield framework relative to the results desired by the commander.

11. *FM 6-20, Fire Support in the AirLand Battle*. 17 May, 1988. Page 3-3 addresses the fire support coordination required for an operation between the various staff officers. The TACFIRE computer will compute most missions, but the fire support officer must assign these missions to specific firing organizations. The size of the firing unit will determine the amount of time a firing activity will take.

12. *FM 6-20, Fire Support in the AirLand Battle*. 17 May, 1988. (p. 3-3) and *FM 5-102, Countermobility*, March, 1985, pp. 37-42 discuss the relationship in planning between the fire support officer and the engineer.

13. *FM 44-1, U.S. Air Defense Artillery Employment*, 9 May, 1983, pp. 2-16 and 2-17 discuss considerations for the movement and massing of air defense systems.

14. *FM 100-15, Corps Operations, Final Draft*. 15 November, 1988. Command and Control activities include the planning and dissemination of orders, supervision of activities, and other activities above and beyond the movement activity described in the example. Command and control is the total process of synchronization as well as one of the battlefield operating systems. (p.3-12)

15. *FM 101-10-1/2, Staff Officer's Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987. Fuel consumption rates and other CSS planning factors may be found in this manual. The time required to perform many other CSS activities can be found in unit ARTEPS, operator's manuals, or in SOPs.

CHAPTER FOUR

Scenario Vignette

The Strategic Setting

This scenario takes place in the notional country of California which is bordered on the east by the country of Arizona. Arizona has been a Soviet satellite for several years and has made illegal incursions into California. California, an ally of the United States, had always been able to counter the threat from the east, but recently, the United States cut aid to their country while the Soviet Union has not only tripled military aid to Arizona, but has also stationed a front size military organization in the border region.

In November, 1992, Arizona forces, assisted by their allies, invaded California. In response to a formal request from the Californian government, the United States dispatched a contingency corps to California to protect the vital interests of the United States. The 10th U.S. Corps consisted of one mechanized division, two armor divisions, an airborne division, an air assault division and a separate infantry brigade. The mission of the contingency force is to assist California in the restoration of peace and the ejection of hostile forces from its country.

As United States forces land, the Californians are deployed on line with three corps abreast, defending in sector. The 1ST Californian Corps, in the center of the

defense, has suffered severe casualties and at the request of the Commander in Chief of the Californian forces will be replaced in sector by the 10th U.S. Corps.

Enemy forces from the 16th Combined Arms Army (CAA) which will oppose the 10th U.S. Corps are arrayed from north to south with an Arizona Light Infantry Division, the 41st Motorized Rifle Division (MRD) in the center and the 36th Motorized Rifle Division making the main attack in the south. The second echelon tank division of the 16th CAA and three divisions of a second echelon Army have been stopped on the east bank of the Colorado River as a result of a highly successful battlefield air interdiction (BAI) campaign which destroyed bridges across the Colorado River. Enemy forces have begun bridging operations and are expected to force a crossing of the Colorado River within forty-eight hours. The enemy main effort appears to be oriented south of the 10th Corps sector with the objective of seizing the California national capitol of Los Angeles.

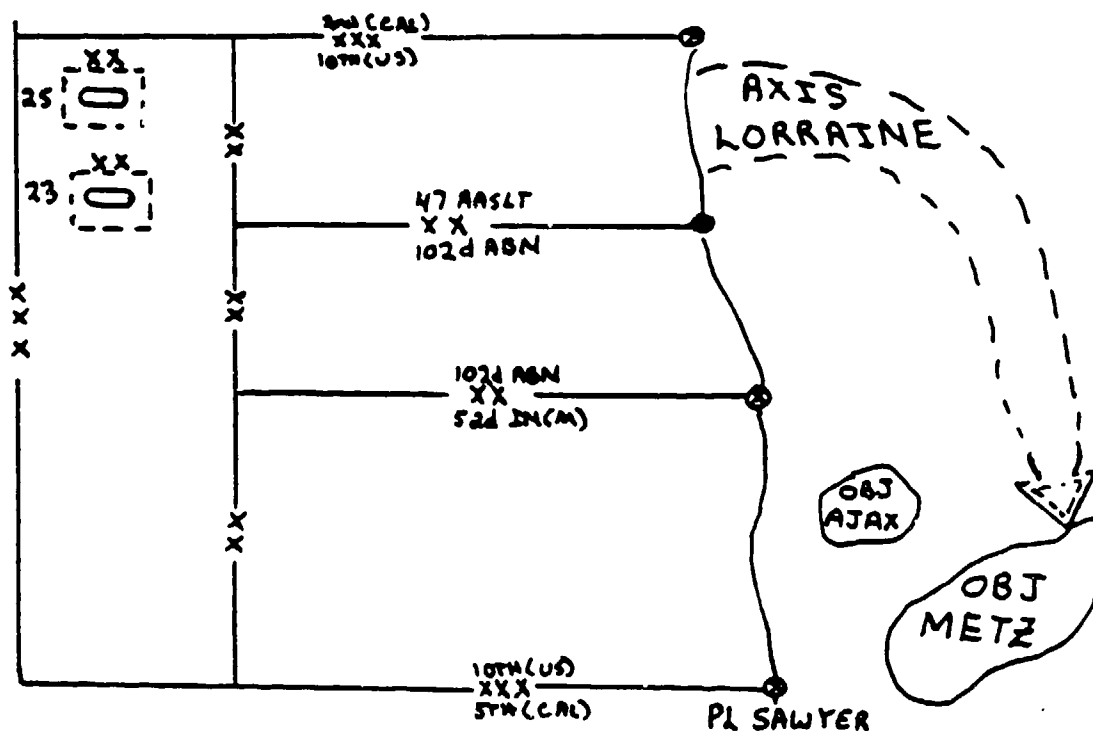
The 10th U.S. Corps Commander's concept is to conduct a relief in place of the 1st California Corps with the 102d Airborne and 47th Air Assault Divisions occupying mountainous terrain in the north and rapidly moving the 52d Mechanized Infantry Division into the southern sector. The corps commander's intent is to delay enemy forces and destroy them in the main battle area while conducting deep operations with the 4th Allied Tactical Fighter Squadron to delay enemy follow-on forces movement across the Colorado

River. The corps commander intends to deceive the enemy into believing that his two armor divisions, the 23d and 25th, will assist the 1ST California Corps in the defense of its national capital, Los Angeles, while in reality he will position these divisions for an attack east through the 47th Air Assault Division and then south to sever enemy lines of communication and destroy follow-on forces in more advantageous terrain.

In combination with the 1ST California Corps (reconstituted), the corps commander intends to launch a counter offensive to destroy remaining forces west of the Colorado River and re-establish the Arizona-California border. (Sketch 4-1, Note 1)

Sketch 4-1

10th (US) Corps Defense and Counter-Attack Plan



52d Division Commander's Concept

The 52d Division Commander is opposed by the 41st and 36th MRDs, and anticipates fighting the 17th Tank Division when this enemy second echelon element is committed. Two brigades of the 52d Infantry Division have relieved elements of the 1st California Corps in zone and have assumed the sector.

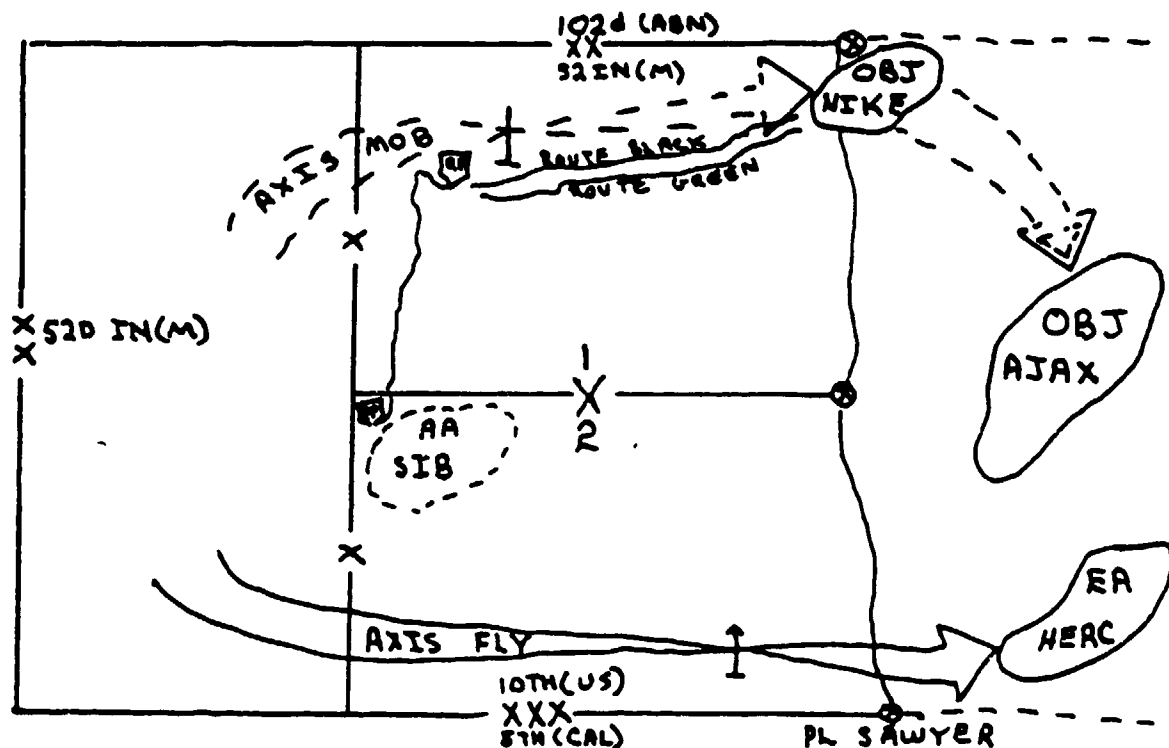
The 52d Division Commander's intent is to defend with two brigades forward in sector. The main defensive effort will be in the south. His intent is to destroy the 41st and 36th MRDs within the sector by giving ground in the south to shape a penetration, rapidly defeat one division in the north then conduct a deep attack with one mechanized infantry brigade and two attack helicopter battalions. These elements will delay the 17th Tank Division which he believes will conduct its main attack against his southern brigade.

Because of the later 'in country' arrival times of the two armored divisions and the separate mechanized infantry brigade, the 52d Division Commander was directed to give his 3rd Brigade to the airborne division to provide them an immediate mobile reserve. The 52d Division Commander asked for and will receive the separate mechanized brigade upon its arrival, and will also receive a brigade of artillery plus an attack helicopter battalion. The Division Commander intends to employ the separate infantry brigade, two attack helicopter battalions and long range artillery as

his deep attack force. These elements will attack through the northern brigade (1st Brigade) sector to delay the follow on enemy tank division, occupy key defensible terrain and protect the corps' right flank during offensive operations. (Sketch 4-2, Note 1)

Sketch 4-2

52d Infantry Division (Mechanized) Defense and Attack Plan



1st Brigade Commander's Intent and Concept

The 1st Brigade is opposed by the 41st MRD which is currently occupying defensive positions nine kilometers east of the brigades security forces. The brigade commander's intent, after analyzing the terrain and enemy forces confronting him, is to initially give ground in the north

while retaining more defensible terrain in the southern part of his sector. This will give him the ability to concentrate combat power by forcing the enemy to piecemeal his efforts.

The brigade commander's concept is to retain strong defensive terrain in the south with about one battalion sized element and portray a second battalion TF defending to its north along PL Sawyer. He will position a third battalion TF defending in sector to appear as the brigade reserve. The 4th battalion TF will be positioned to the rear of the TF defending in the battle position in the south. This battalion will serve as the brigade reserve initially and later as the brigade counter-attack force.

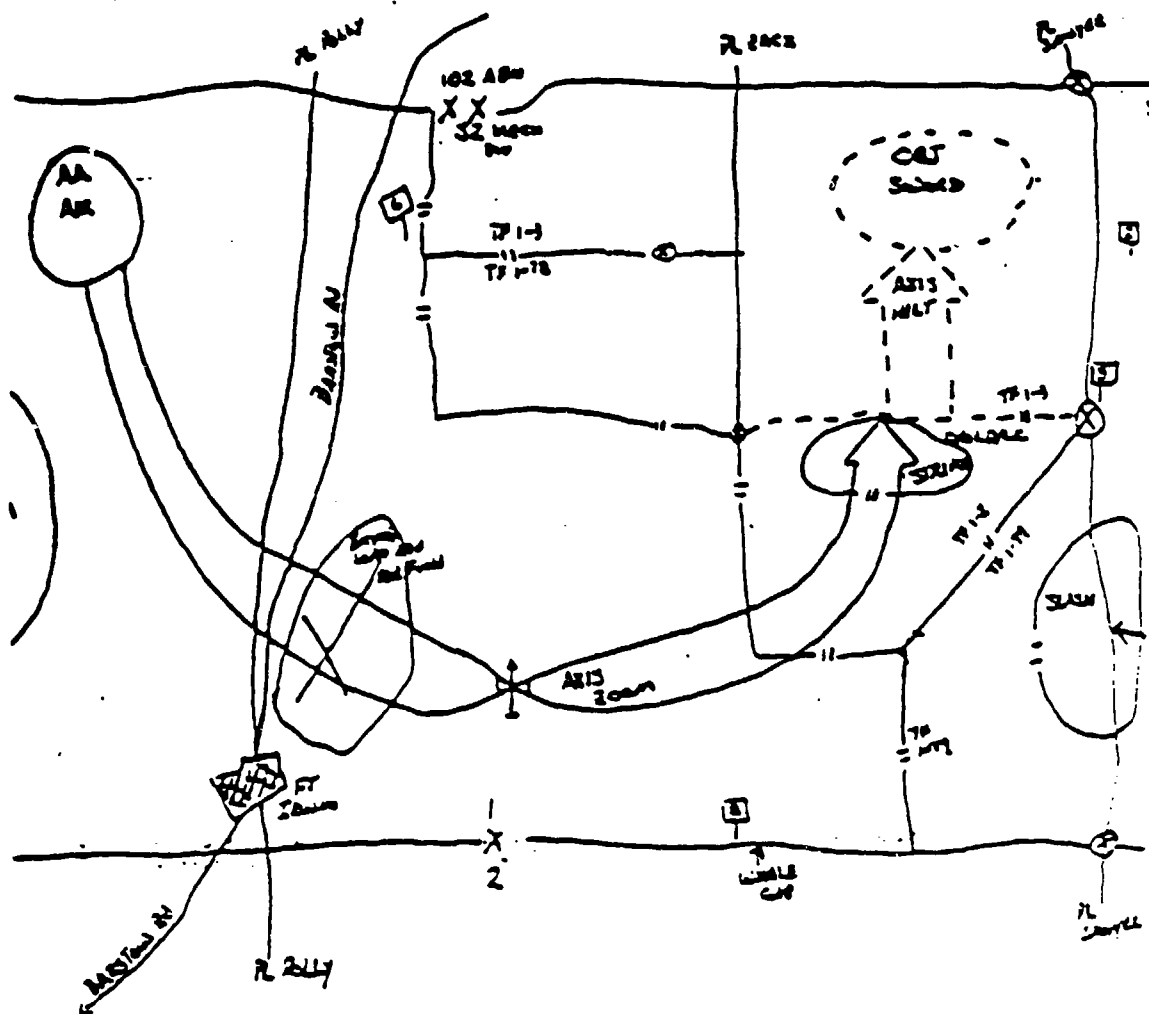
The northern most TF will conduct a deception, portraying a weak sector defense in the north. After conducting a counter reconnaissance screen the TF will withdraw to its Main Battle Area (MBA) positions in sector along side the TF positioned in depth.

From MBA positions all TFs except the reserve will destroy first echelon battalions of the first echelon regiment. Close air support (CAS) and attack helicopters will simultaneously destroy second echelon battalions of the first echelon regiments. Lead battalions of the 2nd echelon regiment will be destroyed in the MBA while the brigade's counter attack battalion destroys the 2nd echelon battalion of the 2nd echelon regiment. Once the brigade fight is over, 1st Brigade will assist passage of the division

counter attack force through its sector. (Sketch 4-3, Note 1)

Sketch 4-3

1st Brigade, 52d Infantry (Mechanized) Defensive Sketch



Battalion Task Force Setting

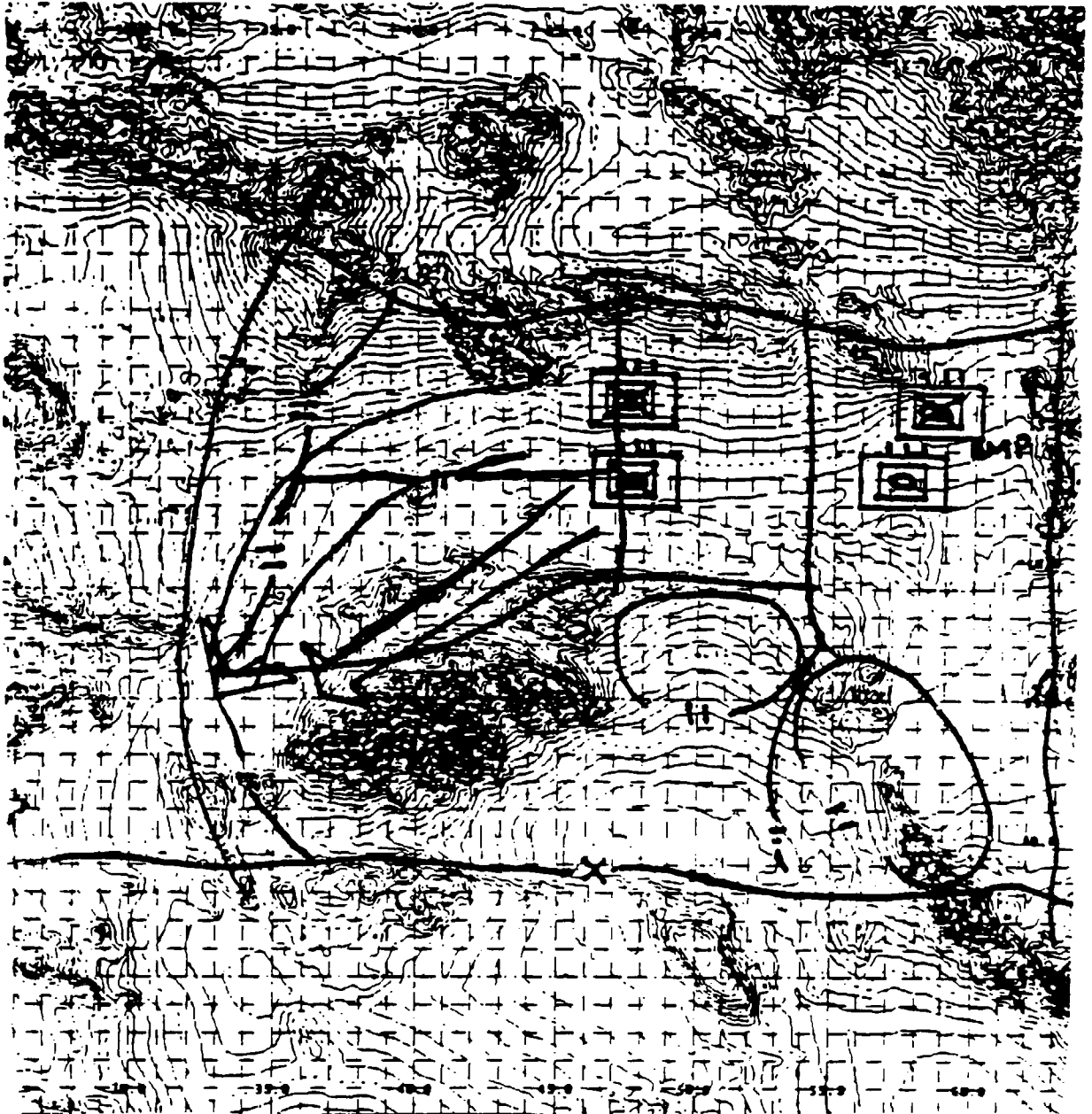
LTC Grant, the commander of TF 1-3, listens intently as the brigade staff briefs the order. He notes that the S-2 appears nervous as he describes the Soviet division facing the brigade. The Brigade S-2 states that because of the Corps Commander's battlefield air interdiction (BAI) campaign, the enemy has reached a culminating point and is currently unable to sustain the momentum of his attack. He estimates that within 48 hours the enemy will force a crossing of the Colorado river and be able to resume the offense.

LTC Grant recognizes that he has a major challenge in just completing the rearward passage of the California forces in sector, but his greater concern is preparing for the defense prior to the enemy's attack. The Brigade S-2 describes the enemy division commander's possible courses of action.

The enemy can attack from positions in contact with two regiments leading and two following, all oriented in the northern part of the sector to penetrate the brigade rear boundary and then turn south.¹ (Sketch 4-4)

Sketch 4-4

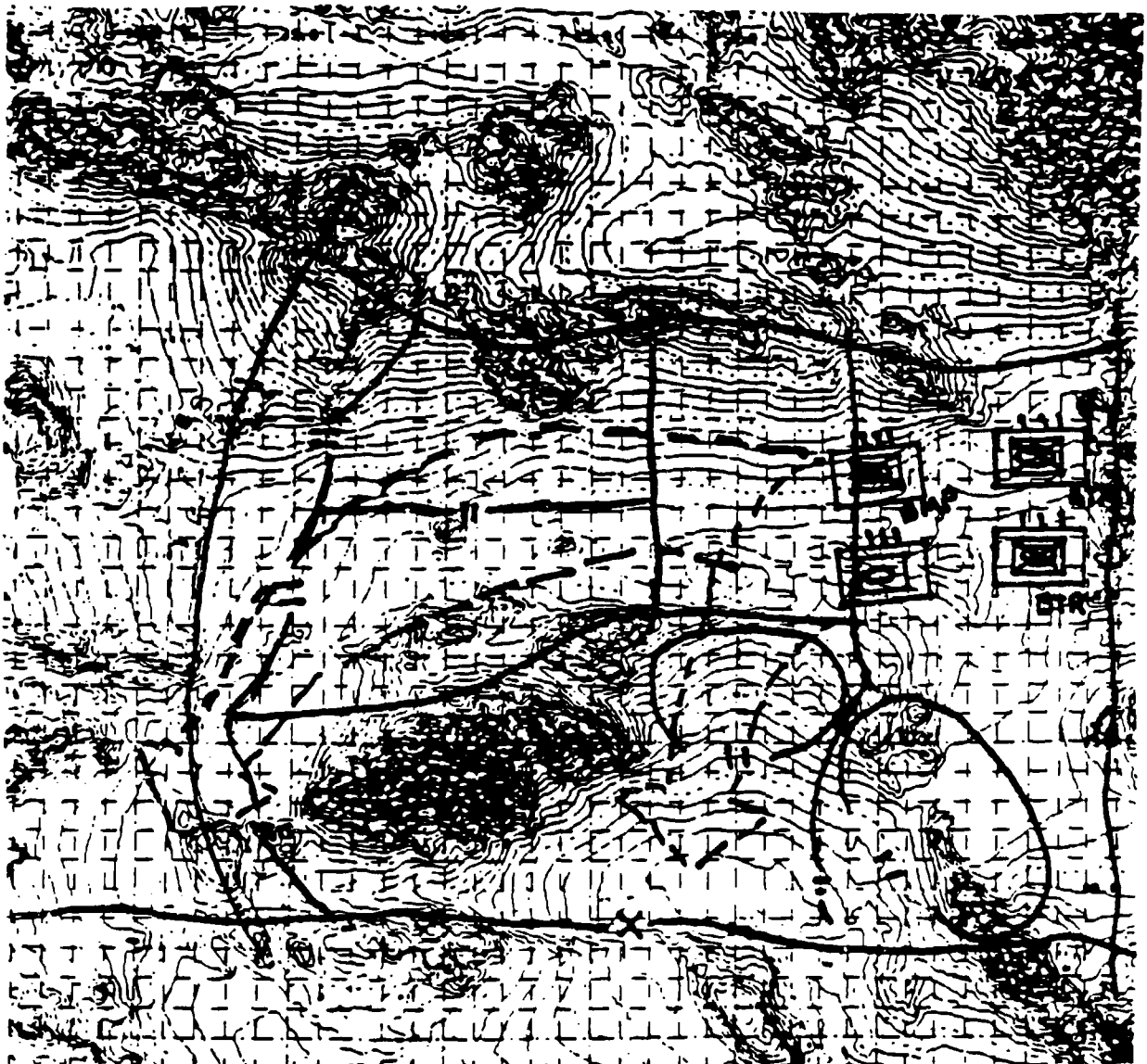
Enemy Option 1. Attack from Positions in Contact. Two Regiments in the First Echelon and Two in the Second Echelon



A second option which appears less likely based on current indications is for the enemy to pass its second echelon regiments through the first echelon, attack from the march column, continue through the sector and turn south or possibly conduct a more shallow attack and immediately turn south.² (Sketch 4-5)

Sketch 4-5

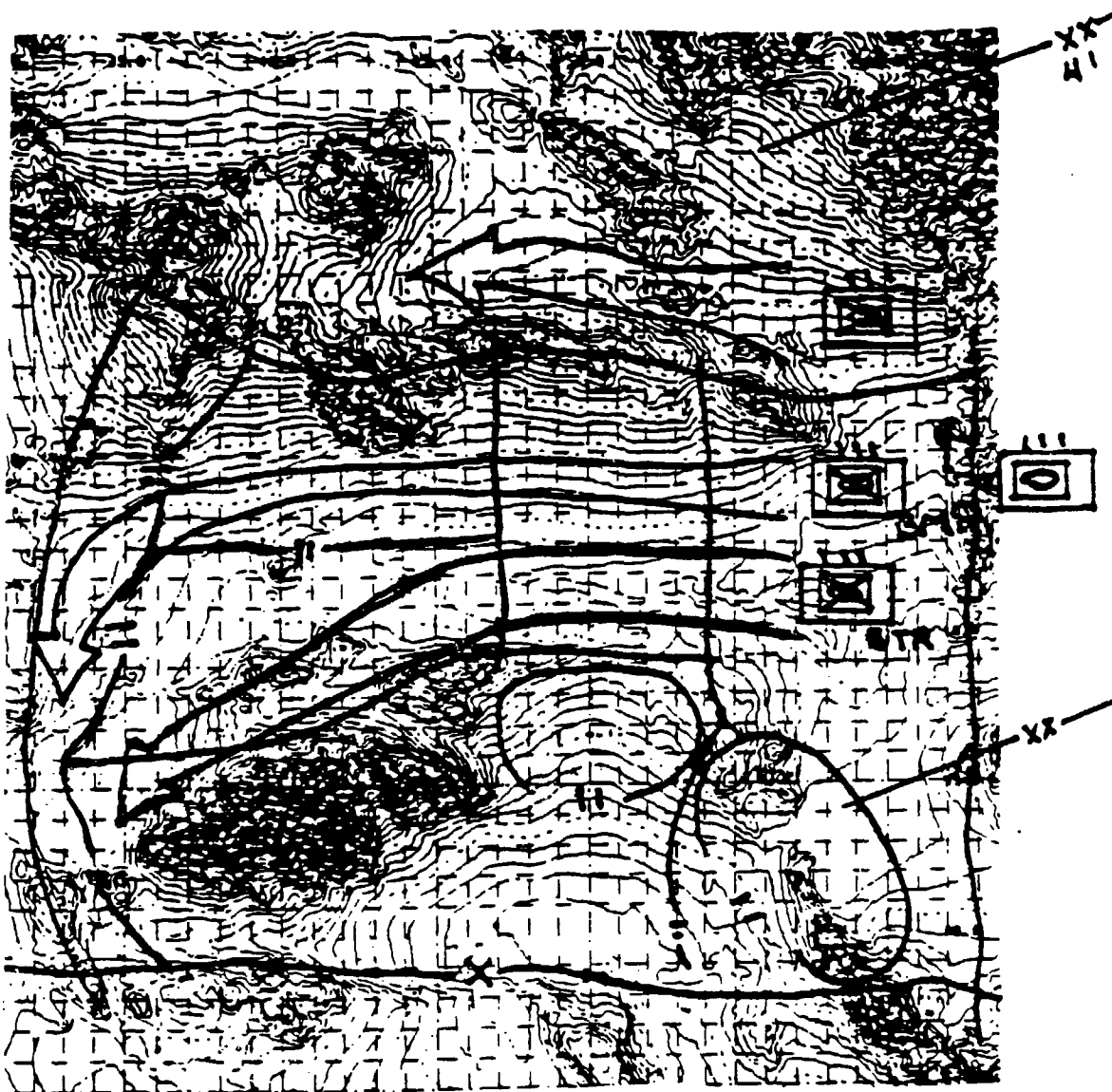
Enemy Option #2. Attack From the March Column



The third option possible is that the enemy will widen its sector and attack with three regiments abreast in the first echelon. The northern most regiment will probably conduct a supporting attack to tie up forces. From the enemy's standpoint, this will permit a main attack through the least defensible, high speed terrain. (Sketch 4-6)

Sketch 4-6

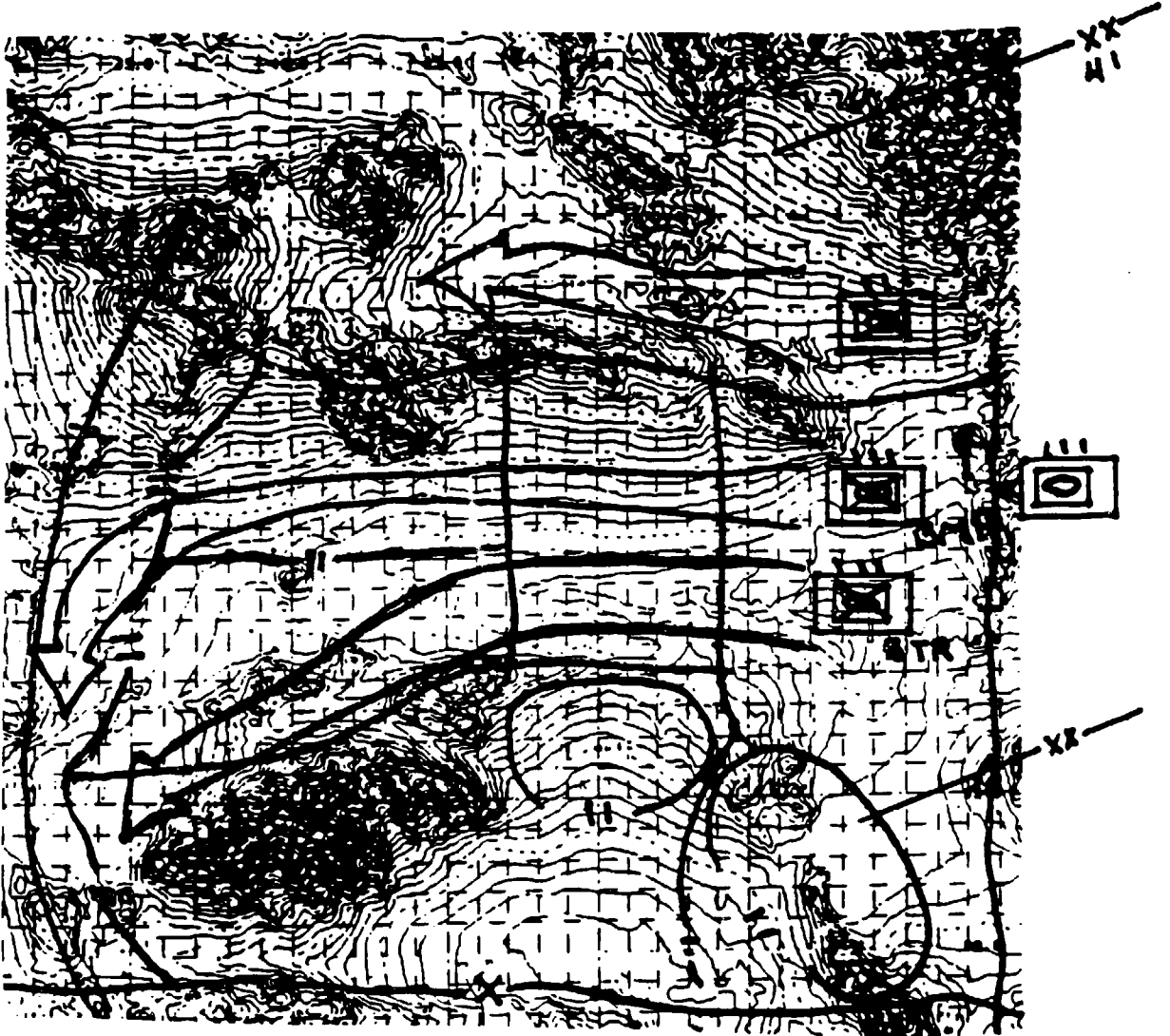
Enemy Option #3. Attack with Three Regiments Leading One Regiment in the Second Echelon



The S-2 adds that intelligence reports provide indicators that the enemy is deploying forces such that the last course of action appears the most likely and that the northernmost regiment will probably attack against the 102nd Airborne division. Indications are that at least one battalion and possibly two from the enemy division adjacent in the south will attack against the southern portion of the 1st Brigade sector. (Sketch 4-7, Note 2)

Sketch 4-7

Most Likely Enemy Course of Action



Based on the information provided him by the staff and his own knowledge and experience, the brigade commander believes the enemy will use the last attack profile briefed. It is against this initial enemy course of action that the brigade commander designed his own course of action.

LTC Grant believes the brigade commander's concept is risky because it causes LTC Grant's battalion TF to attempt to deceive the enemy forward and then withdraw deep within the sector to final MBA positions. He visualizes in his mind what the battlefield conditions will be when he conducts this operation and feels it will probably be a night displacement to the rear. As he looks at the distance involved he notes it is about 16 kilometers and estimates that based on the weather as briefed by the S-2 and the terrain he has reviewed during the briefing, he can only achieve a night rate of movement of ten kilometers per hour.³

The brigade fire support officer (FSO) briefs that during the initial phase of this operation LTC Grant's TF will have priority of fires initially, he is allocated ten copperhead rounds, three high density, high angle artillery delivered family of scatterable mines (FASCAM) minefields, and 200 rounds of 155mm smoke. The FSO emphasizes that the timing of TF fire missions must be closely coordinated because there is only one 155mm Field Artillery (FA) battalion available, an 8-inch FA battalion reinforcing and one 105mm FA battalion (GSR). (Note 3) In addition, the FSO

states that once enemy forces cross PL Sawyer, priority of fires will shift to TF 1-2 and at that time only one FA battery will be available to fire for TF 1-3.⁴

Captain Digger, the brigade engineer, informs LTC Grant that his TF will have a company of engineers with eight digging teams, but that he must consider carefully how much engineer effort to dedicate forward in the security operation as opposed to the amount of effort allocated to the main battle area further to the rear.⁵

Captain Hunter, the assistant S-3, states that a Vulcan platoon and five Stinger teams are attached to TF 1-3 based on the air threat evaluation. As a result of the air avenue of approach assessment, most air defense assets are supporting the division main effort. The air threat from this Soviet division is expected to consist of six Hind helicopters, six Hips, and six Hoplite helicopters which will orient on the soviet division's main effort. CPT Hunter believes these will be employed in the vicinity of the brigade support area (BSA).⁶

The brigade S-4 points out the location of the BSA and discusses the logistics concept of support. He mentions that the BSA will be located 29 kilometers west of the battalion rear boundary and that one way traffic is necessary due to road constraints. Night rates of movement under blackout drive conditions over the designated routes is estimated to be 35 kilometers per hour (KPH). (Note 4)

As the briefing concludes, LTC Grant asks the brigade

commander what would happen if the enemy force did turn south after a shallow penetration. The brigade commander states that he will fight the same fight initially, but will then commit TF 1-3 in a counter-attack against the second echelon battalion of the second echelon regiment while TF 1-2 conducts a reverse slope defense. The brigade commander emphasizes that TF 1-3's reconnaissance elements have a key role to play in this battle because they must observe and report enemy movements through the constricted Silverlake Pass area in the northern part of the brigade sector. (Note 5) The brigade commander states that he will be forward with LTC Grant during the security operation to support the deception effort, and to make the decision of when to displace TF 1-3 rearward to the MBA.

LTC Grant reviewed what the S-2 had briefed about the enemy commander's options and considers the brigade commander's intent and concept of operation in the context of the enemy's attack options. He knows that the enemy will initially have the advantage of initiative by choosing the time and place of the attack. TF 1-3 must somehow seize the initiative from the enemy at the earliest opportunity. To do this will require a complete understanding of how the enemy's decision cycle works, a mastery of time and space relationships, and a fully synchronized TF defense plan.

LTC Grant must determine the enemy's weakness and seek to mass the combat power of his TF against it. He must disrupt the enemy commander's tempo of operations, and force

the enemy into a planning cycle instead of allowing him to execute battle drills as a part of his attack plan.

LTC Grant knew that in the Soviet Army, combat planning decisions were made at the operational level, and that meant the Army commander would plan the upcoming operation in detail.⁷ LTC Grant also knew that once plans involving large scale operations with massed forces were finalized and units start moving, it is hard to redirect or get them stopped. He believes that within two to four hours of the attack time, the plan decided upon by the Soviet Army Commander will be executed as planned.

LTC Grant walks out of the brigade TOC and through the protective wire. As he walks up to his jeep, he is met by his driver who informs him that the TF S-3 has called to report that all TF elements are prepared to reposition on order and reports that the scout platoon has established initial screen positions.

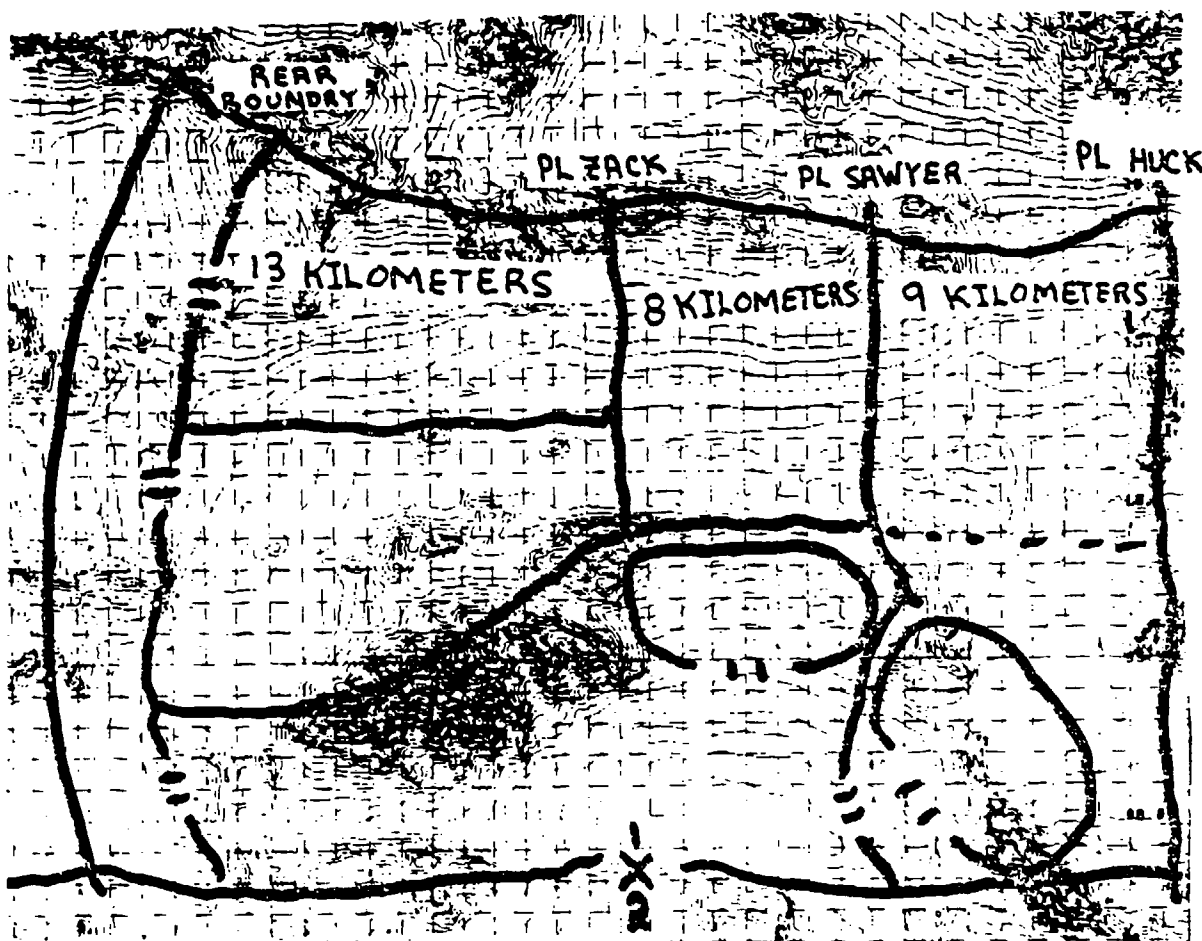
LTC Grant reviews the brigade operations order and overlay graphics and makes some notes on the side of his map case. As he and his driver depart the Brigade TOC, he sends a brief warning order to his S-3 so the TF staff and subordinate units can begin preliminary planning and preparations.

LTC Grant immediately looks at his map and analyzes the terrain and enemy situation to determine how he intends to wrest the initiative from the enemy commander. He first fixes in his mind certain critical distances. He knows that

the enemy occupies terrain along PL Huck and that his own TF has relieved forces in hasty defensive positions along PL Sawyer--nine kilometers west of PL Huck. From Phase line Sawyer to PL Zack is eight kilometers and from PL Zack to the rear boundary is thirteen kilometers.* (Sketch 4-8)

Sketch 4-8

Commander's Time-Distance Analysis



The enemy force can not position its division artillery units any closer than five kilometers east of PL Huck because of mountainous terrain. If LTC Grant can

convince the enemy commander that TF 1-3 is defending along PL Sawyer, the enemy commander will probably position division artillery units east of the mountains to support the attack. The longest range of Soviet 152 and 122 artillery weapons is 18 kilometers without rocket assisted projectiles, but the range of the BM 21 is 30 kilometers.⁹ The distance from where LTC Grant estimates the Soviet commander will position his artillery and where LTC Grant intends to position his forward deception positions is thirteen kilometers.

LTC Grant reasons that his TF can conduct a rearward movement of eight kilometers which will place the TF beyond the range of most supporting Soviet division artillery group (DAG) weapons. This maneuver will decouple the majority of Soviet artillery from the Soviet attack plan, thus forcing the Soviet commander from his predetermined plan into a decision cycle of how to adjust to this new development in the middle of a fight.

Next, LTC Grant estimates the movement rates over the terrain. Since the desert floor is generally trafficable throughout the sector, and there are no weather considerations, he estimates that the enemy can achieve a daylight cross-country movement rate of 20 KPH. He estimates that his force can achieve 25 KPH during daylight conditions but only 10 KPH during hours of darkness. He considers how long it will take to move one kilometer at those speeds to help him visualize the speed of execution.¹⁰

Anticipating the speed of the attacking enemy force at 20 KPH (3 minutes per kilometer), he then mentally converts distances between phase lines (PL) into minutes between phase lines. Nine kilometers between PL Huck and PL Sawyer is equal to 27 minutes of unimpeded movement time. Eight kilometers is equal to 24 minutes and 13 kilometers is equal to 39 minutes.¹¹

LTC Grant studied Soviet troop control while a student at the Command and General Staff College and realizes that his adversary will employ a great deal of reconnaissance prior to the attack.¹² If the Soviet Army commander finds any weak point in the U.S. defense, he will seek to mass his force at the point of weakness.¹³

LTC Grant is determined to use deception, to show weakness where he is really strong, and to cause the Soviet commander to mistakenly attack strength. (Note 6)

As LTC Grant considers his mission and his higher commander's concept of operation, the enemy's tactics, the terrain and weather, his troops available, and the amount of time available (METT-T), he begins forming his own intent and determines what guidance he will give his staff. (Note 7)

LTC Grant recalls the warning of Carl von Clausewitz as he decides upon his own concept for the defensive battle he will soon fight:

The superiority in numbers being a material condition, it was chosen from amongst all the factors required to produce victory, because it could be brought under mathematical laws through combinations of time and space. (Clausewitz, 1832)

LTC Grant knows there is much more to the Art and Science of War than pure numbers. He realizes that his own success will only be realized if he and his TF can synchronize all the elements of combat power available within the TF at the decisive time and place to destroy the attacking enemy force.

LTC Grant's Concept

LTC Grant's concept of operation is to portray a prepared defense along PL Sawyer while preparing actual defensive positions deep within the defensive sector beyond the range of Soviet tube artillery. The deception positions must be sufficiently strong to cause the enemy commander to plan artillery concentrations on them. LTC Grant wants to maintain the deception for as long as possible, but does not want to fight a major engagement or be forced to delay under pressure from the forward positions.¹⁴

LTC Grant arrives at his battalion CP and briefs his TF staff on the brigade plan and gives them his own concept. He provides each staff officer with adequate guidance to allow them to begin preparing their own estimates.

The TF S-2 and S-3 began the task of threat integration adding all known additional enemy information to the IPB while the other staff officers provide their input to the enemy's probable attack profile for the selected enemy course of action.¹⁵ When the probable enemy attack profile is completed, the commander and S-2 examine the terrain to determine at what point on the ground the enemy

can alter his attack orientation. They consider each possible variation in the attack profile and determine what the indicators of possible variations will be.

LTC Grant and the TF S-3 prepare two courses of action for the defensive operation. While LTC Grant refines his own estimate of the situation and talks with his company team commanders, the TF XO and battle staff evaluate the courses of action and prepare a decision briefing. Each course of action evaluated is feasible and both follow the commander's guidance, but the staff recommends only one.

After the staff completed their analysis and initial war game, they briefed LTC Grant, and recommended a single course of action. LTC Grant accepted the staff recommendation, but made some modifications to the recommended course of action. The approved course of action is as follows:

TF 1-3 will conduct a counter-reconnaissance screen with two armor companies forward in Battle Positions (BPs) 101 and 103. A mech heavy team will prepare a simulated strongpoint (SP) at SP 1. The last tank heavy team will occupy a reserve position at BP 105. Scouts will occupy observation positions (OPs) 1-5 supported by two combat observation lasing teams (COLT) and two ground surveillance radars (GSRs).

While the majority of each company team prepare screening positions along PL Sawyer, one platoon from each will prepare main battle area (MBA) positions under the

supervision of the team commanders. As each platoon completes MBA preparations, they will move forward to the screen positions while another platoon moves back to prepare their MBA positions. This activity will allow each platoon to reconnoissance its routes, rehearse the displacement, will be incorporated into the reconnoissance plan, and will be consistent with U.S. doctrine of preparing defensive positions in depth.

Dismounted infantry platoons from TM A will prepare strong point (SP) 2. TM A will prepare SP 1 and BP 107. CO B will prepare BPs 101 and 102 while CO C prepares BPs 103 and 104. TM D will prepare BPs 105 and 108.

Prior to the anticipated enemy attack time, TM D will move forward to occupy BPs 101, 103, and SP 1. The two tank platoons from TM D will occupy BPs 101 and 103 while the Mech platoon occupies SP 1. This will insure that a consistent mix of TF killing systems are represented in the screen positions for as long as possible.

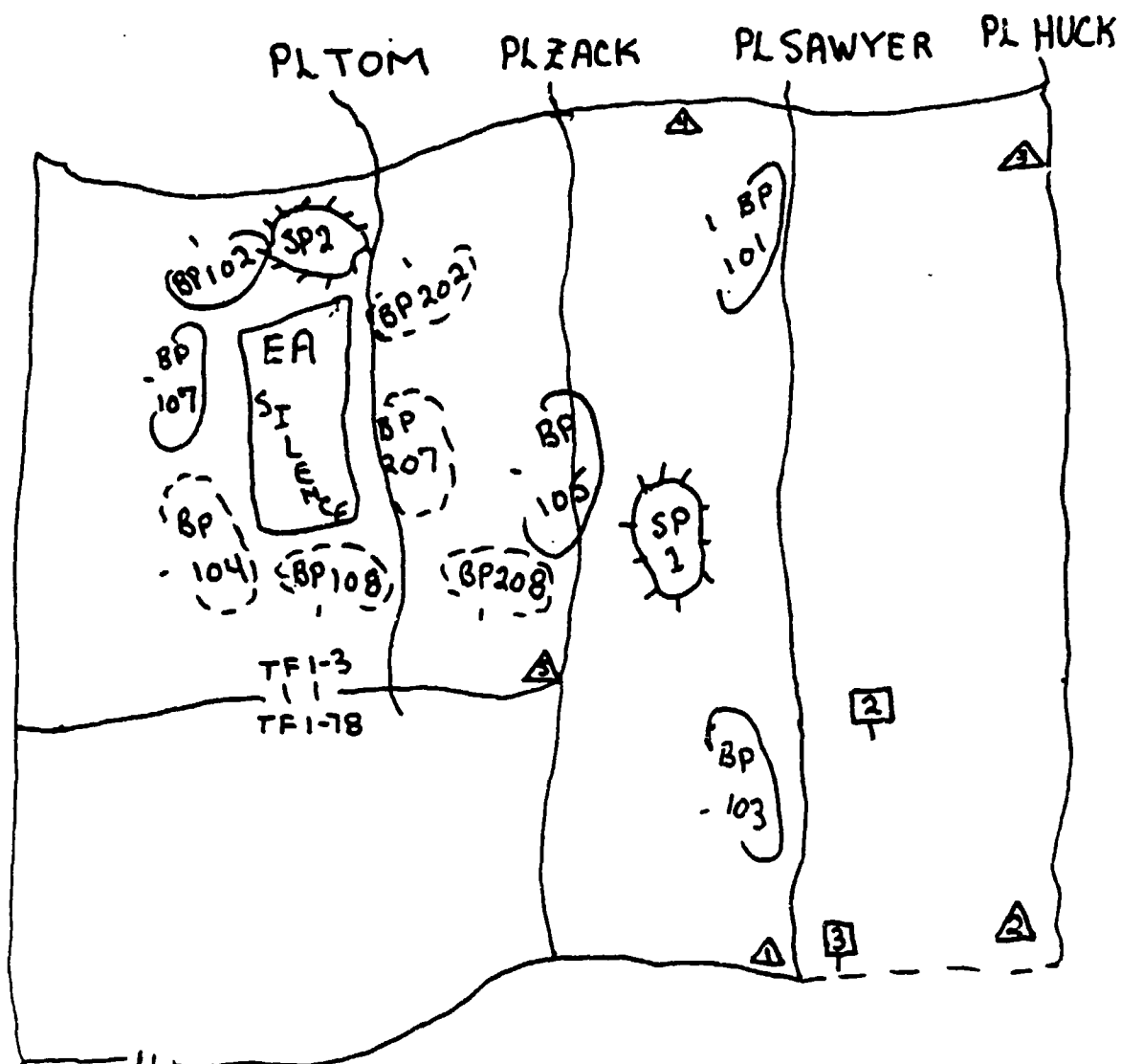
On order of the brigade commander, TF 1-3 minus TM D will conduct a night move to the rear and occupy the MBA positions. On Order, TM D will displace from screen positions to occupy MBA positions. The scout platoon will remain on OPs 1-5 and use allocated copperhead rounds to engage enemy reconnoissance forces moving in the sector after withdrawal of TM D. (Sketch 9)

LTC Grant directed the staff to prepare a synchronization matrix for this course of action and to pay

close attention to the time and space relationships involved in the operation. (Sketch 9)

Sketch 9

TF 1-3 Course of Action Sketch



REFERENCE NOTES CHAPTER FOUR

1. The scenario and sketches 1 thru 3 used in this vignette have been taken from the Brigade and Battalion Task Force Synchronization exercise used during instruction to brigade and battalion commanders at the Pre Command Course (PCC), Ft. Leavenworth, Kansas.
2. Operations Order 1, Division extract, brigade commander's PCC, 141100 August, 1986, Annex A Intelligence, pp. 11-16.
3. Operations Order 1, Division extract, brigade commander's PCC, 141100 August, 1986, p. 2. The three different artillery pieces represented have different capabilities and limitations and are used in the scenario to cause the commander to consider their different characteristics. Since there is only one 155mm Howitzer battalion, the commander should recognize that this is the only system which can fire Copperhead and FASCAM. The 105 Howitzer has limited range and no TACFIRE capability unless augmented by the 155mm battalion.
4. Operations Order 1, Division extract, brigade commander's PCC, 141100 August, 1986, Appendix C, Operations Overlay. The distance and time required to move along the routes dictates that approximately one hour is involved in the movement of resupply assets going one way. Turn around time would be two hours excluding actual resupply activity time.
5. Operations Order 1, 1st Brigade, 52d Inf Div (M) extract, battalion commander's PCC, 141900 August, 1986, p. 25. Surveillance of Silverlake Pass is directed by brigade headquarters in the order. Movement through this pass by Soviet forces is expected, and will be used for decision making.
6. FM 90-2, *Battlefield Deception*. May, 1987, pp. 3-2 and 3-3. This manual states that Battlefield Deception should be considered at the same time the commander is planning his scheme of maneuver if deception is to be synchronized with the operating systems. Battlefield deception has its own subordinate activities which must be arranged in time and space.
7. *Student Text 100-9, The Command Estimate*. July 1988. The Command and General Staff College, p. 2-5. The command estimate states that initial commander's intent is issued with planning guidance to provide the framework for the staff's future estimates and plans.

REFERENCE LIST CHAPTER FOUR

Clausewitz, C. (Rapoport, A., & Graham, J.J.) [*Clausewitz On War*]. Baltimore, Maryland. Pelican Books, 1968.

ENDNOTES CHAPTER FOUR

¹. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 5-13. Attack from positions in contact is described as the least preferred method of attack by soviet forces. It is used when elements are in contact or are going from the defense to an immediate offense.

². *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 5-13. Attack from the march column is the preferred method of attack by soviet forces.

³. This movement rate is slow but establishes a consistent planning factor for use in the synchronization planning process. At 10 KPH, the displacement would require 1.6 hours for movement alone.

⁴. *FM 6-20-40, Tactics, Techniques, and Procedures for Fire Support for Brigade Operations (Heavy)*, final draft. December, 1988: appendix I has an excellent discussion of Field Artillery delivered FASCAM minefields. The number of RAAMS and ADAM rounds necessary to achieve the desired density of .004 is 96 RAAMS + 24 ADAM = 120. To calculate the required time to emplace the minefield, divide the number of rounds required by the number of tubes firing--in this case the battalion TF commander was told to plan on one battery. Time required to emplace the minefield is $120/8 = 15$ minutes.

⁵. *FM 101-10-1/2, Staff Officer's Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987. The digging rates for one team are specified in For the purpose of this thesis these rates will be used for tank ditch and survivability construction:

Tank Ditch-----	75 meters/hour per team
Hull down positions (M1)-----	1 position/hour
Fighting Position (M2)-----	1 position/hour
Turret down position-----	1 position/1.3 hours

⁶. *FM 44-16, Platoon Combat Operations-Chaparral, Vulcan, and Stinger*. May, 1987, p. 6-8. This FM states that allocation for Air Defense assets is based upon the critically of the asset, its vulnerability, recuperability, and the anticipated threat.

⁷. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, pp. 5-18 through 5-25.

⁸. These distances are based upon the graphics the TF commander placed on his map to help establish time-distance rates for his own force and the enemy's force.

9. *FM 100-2-3, The Soviet Army, Troops, Organization and Equipment.* 16 July, 1984, pp. 5-47 through 5-64.

10. These speeds are reduced from kilometers per Hour to meters per minute to demonstrate the relationship between selected activities. This is a simple mathematical process. For this thesis, the following rates will apply:

30 KPH	=	500 MPM	-----	1 kilometer every 2 minutes
25 KPH	=	416 MPM	-----	1 kilometer every 2 minutes and 24 sec.
20 KPH	=	333 MPM	-----	1 kilometer every 3 minutes
15 KPH	=	250 MPM	-----	1 kilometer every 4 minutes
10 KPH	=	164 MPM	-----	1 kilometer every 6 minutes
5 KPH	=	83 MPM	-----	1 kilometer every 12 minutes
1 KPH	=	16 MPM	-----	1 kilometer every 60 minutes

11. These time-lines will be useful when computing available time for firing artillery concentrations and allocating priority fire missions.

12. *FM 100-2-1, The Soviet Army, Operations and Tactics.* 16 July, 1984, pp. 7-1 through 7-3. Soviet reconnaissance employment is discussed in detail throughout FM 100-2-1 but is specifically addressed in this chapter.

13. *FM 100-5, Operations.* May, 1986, Appendix A, p. 174. Mass is a principle of war for both U.S. and Soviet Armies. The purpose of synchronization is to properly achieve Mass.

14. *FM 100-2-1, The Soviet Army, Operations and Tactics.* 16 July, 1984, p. 5-21. Considering the Soviet's normal attack doctrine for the employment of artillery, the commander would be wise to relocate his elements prior to the Soviet Artillery preparation.

15. *FM 34-1, Intelligence and Electronic Warfare Operations.* 2 July, 1987, pp. 3-3 through 3-6. IPB is not solely a function of the S-2/G-2. Rather, it is a staff effort involving all elements of the staff to varying degrees.

CHAPTER FIVE

Application of the Synchronization Planning Matrix

LTC Grant knew that to win in battle required the full synchronization of all TF combat, combat support, and combat service support systems. He had trained his staff to synchronize all TF activities against a standard time-line shared by his own unit and the anticipated enemy.

Since time is one of the most valuable resources in combat, his staff reduced all activities to this one common denominator. The process for accomplishing this task required extensive training and close cooperation between all members of the TF battle staff. LTC Grant felt better about the difficult tasks that lay ahead for he and his TF as he reflected on the detailed synchronization training they had completed during the year he had been in command. The TFs' recent successful performance at the national training center reinforced his confidence.

Learning how to synchronize was not an easy task, but once each staff officer understood his role in the synchronization planning process and had developed a set of planning factors and activities for his own staff area, the process was internalized, became second nature, and was finally mastered.

When LTC Grant approved the course of action, the full staff continued the synchronization planning process focusing on the key activities. Since the brigade S-2

briefed that the enemy is capable of resuming the attack within 48 hours, and at least 12 hours (approximately 1/4 of the total time available) will be required for planning and movement of the TF. the staff will use 36 hours as its available preparation and execution time-line. (Note 1)

Once the time-line has been established, the most likely enemy course of action which the commander selects is transferred from the 'event template' to the battalion TF synchronization planning matrix and is arrayed beneath the time-line.

The S-2 accomplishes this by translating anticipated enemy movements across space into timed events. (Note 2) He does this by anticipating the enemy commander's activities within the framework of the enemy's own seven battlefield functions. The entire battle staff assists in the process, each officer providing a portion of the enemy attack profile. The S-2, assisted by the TF engineer, provides anticipated movement rates and determines a probable attack time. The S-2 anticipates the enemy's use of divisional and regimental reconnaissance teams beginning twenty-four hours and eight hours respectively prior to the attack of main body forces.¹ In addition, he believes the enemy will employ combat patrols to capture advantageous terrain to facilitate observation into his TF's defensive sector starting about 12 hours prior to the main attack. He transfers these anticipated enemy events to the matrix and arranges them below the appropriate time on the time-line.

The TF FSO verifies the probable employment of Soviet artillery commencing with the movement of first echelon forces and assists the S-2 in templating the location of the various Soviet division and regimental artillery groups.² He also begins developing recommended counterfire priorities that will later be given to the brigade FSO.³

In a similar manner, the TF air defense artillery (ADA) officer and air liaison officer (ALO) conduct a threat evaluation of the airspace over the TF sector. They suggest the enemy might employ his few attack helicopters and perhaps a company of sirmobile infantry into the TF sector transported by the "Hips" as the Soviet first echelon regiments cross PL Sawyer. The ALO calculates the speed of these aircraft at 90 Knots (3 Km/Min) flying low level and estimates that if Soviet helicopters are observed crossing PL Huck, they will arrive at PL Zack within approximately 6 minutes (17 Km divided by 3 Km/min). In addition, he expects the enemy air avenues of approach to be located over attack into the rear of the TF.⁴

The ADA officer states that the majority of SA 14s and the ZSU 23-4s will probably be well forward with the first echelon attack forces. He estimates that the SA-9s will be centrally located around the second echelon battalions.⁵

Since the Soviet force is attacking a prepared defense, the TF Engineer expects to see mine rollers employed by the first echelon battalions and supported by

dismounted breaching teams. He anticipates that the mine rollers will slow the movement of the Soviet attack formation to about 20 KPH.* He also expects to see engineers assisting the regimental reconnaissance elements with prebreaching activities and conducting engineering reconnaissance tasks.7

The TF S-4 states that based upon the distance the enemy is moving and the anticipated depth of his operation, he sees no problem for the enemy in sustaining their attack. He considers the TF deception effort critical from a logistical standpoint because he believes the Soviets will prestock an extensive amount of artillery ammunition to conduct its preparation fires. If successfully deceived, the enemy will be forced to leave prestocked ammunition behind as artillery weapons are repositioned forward to support the attack.* The S-4 states that a few well placed artillery delivered FASCAM minefields can cause substantial delay to those enemy artillery elements forced to reposition.

After each staff officer completes his portion of the intelligence preparation of the battlefield (IPB), the appropriate annotation is added to the matrix. (Figure 5-1)

Figure 5-1

Time-Line and Enemy Courses of Action

BATTALION DEFENSIVE SYNCHRONIZATION MATRIX

	H-36	H-27	H-24	H-21	H-18	H-12	H-9	H-6	H-3	H-HR	H+30	H+1	H+1:30
TIME	151700		160500			161700		2300	0200	170500		06	0630
I C										1ST BCH	1ECH	1ECH	
H O			DIV RECON			COMBAT	REGTL RECON			ARTY PREP	PL	EA	
A			PATROLS			PATROLS	PATROLS			JAMMING	ZACK	SILENCE	
										SMOKE			

LTC Grant and the S-2 discuss the four possible enemy attack options, considering terrain limitations. Knowing that the enemy normally reinforces his three motorized rifle battalions (MRBs) with tanks from the tank battalion, they believe the regimental attack will consist of three reinforced MRBs. The most likely array, if the deception is successful, is an attack from the march column with all three MRB's attacking in the northern part of the sector. A second enemy option is an attack from the march column with all three MRB's attacking in the southern part of the sector. The third possible option is for the enemy to attack with two battalions forward and a second echelon battalion following, with the main attack oriented on the northern part of the sector. The final option is an attack with two battalions forward and one back with the main

attack oriented in the south. (sketch 5-1)

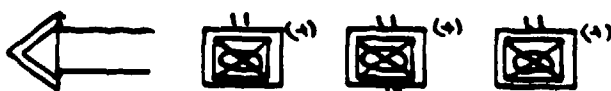
Sketch 5-1

Possible Enemy Attack Profiles .

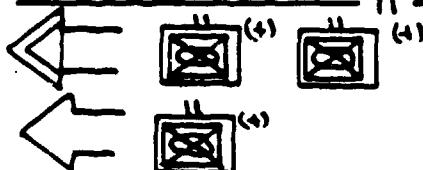
OPTION ONE--ATTACK FROM MARCH COLUMN ALL IN THE NORTH



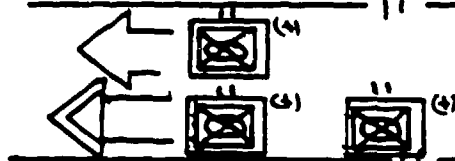
OPTION TWO--ATTACK FROM MARCH COLUMN ALL IN THE SOUTH



OPTION THREE--TWO BATTALIONS IN THE NORTH, ONE SOUTH



OPTION FOUR--TWO BATTALIONS IN THE SOUTH, ONE NORTH



Based upon terrain and time-distance considerations, the commander and S-2 determine the enemy commander will be committed to a course of action when his lead MRB passes PL Tom. If the TF reconfigures the defense at this point, they must do so in less than 12 minutes, because the enemy attacking at 20 KPH will arrive in the engagement area 15 minutes after passing PL Tom.

To account for the enemy's various attack options,

the commander and S-3 select proposed battle positions in depth for the company teams which will allow repositioning of TF units should the enemy attack differently than expected.

In coordination with the S-2 and FSO, the S-3 selects Named Areas of Interest (NAIs) which will be used to verify which course of action the enemy is executing. After he accomplishes this, he considers his own and the enemy's movement rates. The distances his repositioning units must move to occupy proposed battle positions are examined in relation to the distance the enemy must move along each possible avenue of approach. By using the estimated speed of the enemy and the distance the enemy force will move, the S-3 determines where the enemy will be when a decision must be made to reposition forces to the in depth positions. He changes previously selected NAIs into Decision Points (DPs) which will "trigger" the timely repositioning of TF company teams.

By knowing how long it takes friendly forces to reposition relative to the enemy force's attack speed, the TF commander can exercise agility by repositioning his forces to mass combat power more quickly than the enemy can attack while executing battle drills.*

The enemy seeks to mass his forces where he detects or perceives weakness in friendly defensive positions. It is important to cause the enemy to mass at the wrong place and time in order to delay, confuse, and attrit him. When

the enemy is not prepared to mass is the optimum time to attack and destroy his forces with massed friendly direct and indirect fires.¹⁰

The concept of causing the enemy to mass at the wrong place is LTC Grant's intent and is best achieved if the deception is well planned and executed. The S-3 believes most of the TF's combat power should be positioned forward initially to achieve the desired deception. By positioning two company teams well forward along PL Sawyer in battle positions (BPs) he can cause the enemy to dedicate a substantial amount of his preparatory artillery fires to them. Positioning a third team in a simulated strongpoint position centered on and behind the first two teams will force the enemy to plan a substantial artillery preparation to neutralize that position. The S-3 will position the fourth company team in depth to appear as the TF reserve.¹¹

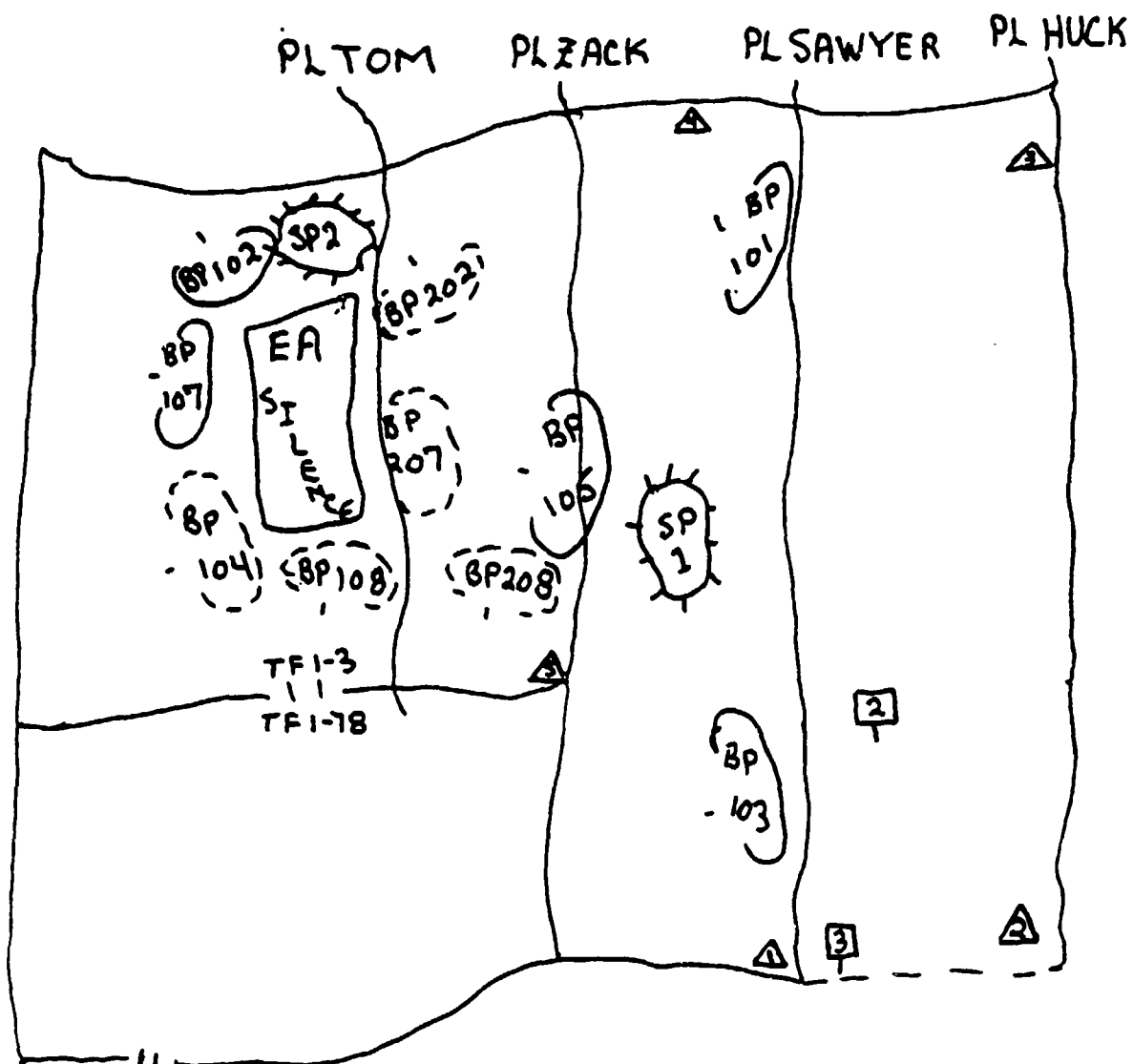
Prior to the anticipated enemy attack time, the commander will reposition the reserve forward to continue the deception. Main body forces will reposition back to the main battle area (MBA) where they will occupy their actual BP's and conduct necessary resupply activities. The S-3 calculates the reposition time of each element and plots them on the matrix using a reverse planning process.

First, he calculates how long it takes to move from BP 101, 103 and SP 1 to BPs 102, 104, 107, and SP 2. Next, he calculates how long it will take to move the reserve company team from the reserve position, BP 105, to the

forward positions, BPs 101, 103, and SP 1 and then how long it will take to move from these positions to the MBA position at BP 108. The S-3, in his wargame determines that these displacements will occur at night, and therefore uses only 10 KPH as his planning factor because his unit is unfamiliar with this terrain. (Sketch 5-2)

Sketch 5-2

TF 1-3 Course of Action Sketch



At 10 KPH, his elements can move one kilometer every 6 minutes. The distances each element of the TF must move are 16 kilometers--BP 101 to BP 102, 16 kilometers from BP 103 to BP 104, 12 kilometers from SP 1 to BP 107, and 9 kilometers from BP 105 to BP 103. He then employs simple math to reduce the distance to time--16 kilometers X 6 minutes per kilometer = 96 Minutes = 1 hour and 36 minutes. 12 kilometers X 6 minutes per kilometer = 72 minutes = 1 hour and 12 minutes. Once the S-3 reduces all unit movements to time he adds an additional 10 minutes as a standard planning factor to account for position occupation time and then arranges these activities on the matrix at the times when he believes these activities need to occur in relation to anticipated enemy activities.

The defensive battlefield framework referenced in FM 100-5 (1986) provides a structure for arraying the TF. Since his TF elements are positioned within the five elements of the battlefield framework, LTC Grant uses the battlefield framework to arrange the maneuver of his forces on the matrix. He arranges the maneuver activities beneath the enemy's anticipated activities so he can better visualize what the enemy's response to the TF course of action might be. (Figure 5-2)

Friendly Force Maneuver Course of Action

The S-3 next considers how to construct the TF engagement area (EA) to achieve the maximum amount of destruction possible considering all enemy attack options. He calls together the S-2, the fire support officer (FSO), the engineer, and his air liaison officer (ALO) to discuss proper construction of the EAs. From the approved course of action and the commander's guidance, the S-3 knows where the commander wants to destroy the enemy force and knows about

when he can expect the enemy force to arrive in each EA. He also knows that if the deception plan is successful, the enemy force will probably be moving in column formation and that to mass direct and indirect fires on the enemy will require an obstacle plan which will canalize the enemy and cause him to 'bunch up'.¹²

The S-3 has considered all the enemy's possible attack options and has determined where the enemy commander will be forced to decide which attack profile to use. At the point where the enemy commander must make his decisions, PL Tom, the S-3 will ensure an intelligence collection asset is positioned to tell the TF commander which way the enemy is attacking.

This is an important part of the planning process because by timing the enemy movements and knowing how long it takes for the enemy to arrive in the EA, a friendly course of action can be designed to allow for a rapid shifting of force to concentrate combat power against the enemy regardless of the course of action he executes.

In coordination with the S-3, S-2, and TF engineer, the commander establishes the location for the EAs. Around the EAs, the S-3 adjusts the tentative battle positions for each platoon, then groups these platoon positions into company team positions to maximize weapons systems capabilities. The S-3 and S-2 estimate the number of enemy vehicles by type which can attack into the EAs considering the enemy's most likely attack profile, and then they

consider the other possible enemy attack profiles which allows them to select locations for contingency BPs. The exact locations for each battle position and each firing system will be finalized during the leader's reconnaissance.

Based upon the S-2's template of the enemy's movements across the battle area, the FSO plans groups and series of targets along each avenue of approach to mass indirect fires on the attacking enemy forces. The S-2 coordinates the positioning of intelligence collection assets (scouts, GSR, infantry observers and COLTS) with the S-3 and FSO to observe points where the fires need to be requested in order for these artillery fires to be delivered on the enemy. These points on the ground where fires need to be called are the "decision points" which will be used to call scheduled fires on targeted areas of interest (TAIs).

The decision points (DPs) mentioned earlier were selected to observe enemy movements and tell the TF commander which attack option the enemy had chosen. The relative time distance analysis conducted earlier confirms that the decision points are far enough away to provide repositioning time for the TF. After all DP's have been determined, the S-3 tasks specific elements of the TF to observe and report or call fires (whichever is appropriate for the DP observed) on them.

Because TAIs are planned priority targets, the standard for delivery of fires from the initial call for fire is 1 minute and 15 seconds. (Note 3) By knowing how

long it takes the artillery unit to fire the mission after fires are requested, the FSO can calculate where to place TAIs in relation to the decision points to ensure maximum effects fall on the enemy force instead of in front of or behind him.

Estimating that the enemy can move at 20 KPH means he moves one kilometer every three minutes or about 333 meters per minute. In one minute and 15 seconds the enemy will move about 416 meters. Time of flight for the rounds is 30 seconds. The total time of one minute and 45 seconds converted to distance means the TAIs must not be placed closer than 583 meters from the DP along the enemy avenue of approach. With this information, the FSO is able to more accurately plot the grid location for his series of targets and translates the DPs into target reference points (TRPs) for the observers who will request fires.

Since the commander wants to achieve 10 percent destruction on the enemy force in the EA with artillery, the TF FSO coordinates with the S-2 who estimates the size of the force which will be in the EA. The FSO designs a group target which covers the area where the S-3 wants the enemy concentrated and then requests information through the TACFIRE system on how many rounds will be fired by available fire support systems to achieve the desired level of target effects.¹³ TACFIRE computes the data and estimates the number of rounds necessary to achieve the desired effects at 288 rounds.¹⁴ The brigade FSO develops the fireplan and

Since the 155 Howitzer has a sustained rate of fire of one round per minute per tube, this firing activity will require 11 minutes to complete.¹⁵ This information is essential for the engineer who must construct an obstacle designed to hold the enemy in the EA for at least 11 minutes. The FSO completes his estimates and annotates the timing of his fires to the synchronization planning matrix. (Figure 5-3)

Fire Support Activities

[illegible]

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of breaching a minefield in 5 minutes, the TF engineer knows he will have to construct a complex obstacle which will cause an additional 6 minutes of delay.¹⁶ He can achieve this by reinforcing a minefield with wire entanglements laced with antipersonnel mines and constructing an additional minefield in depth behind the wire obstacle. By overwatching this obstacle with direct fires, the TF can keep the enemy in the kill zone for at least 15 minutes allowing the indirect fire support assets to achieve massed fires. Based upon the FSO's requirements, the engineer officer knows how much of the engineer assets he must allocate to achieve the desired target effects.

The TF engineer has eight digging teams available to him for the mission. These digging teams will be employed to dig both survivability positions and countermobility obstacles. The TF commander has given priority to survivability starting with tank positions in BP 102 and 104. The engineer calculates the amount of time required to dig in the TF vehicles with available assets. Considering the type of sandy desert soil dominant in the TF sector, he determines that each team can dig a single turret down position for an M1 tank in 1.3 hours, a hull down position in 1 hour and a fighting position for an M2 in 1 hour.¹⁷

The TF has a total of 44 M1 tanks and 13 M2 Bradley Fighting Vehicles (BFVs). At the estimated digging rate, the 8 teams will require the following amounts of time to prepare each BP with the assets indicated: BP 102 requires

14 turret down positions--14 X 1.3 hours per position = 18.2 team hours. With two teams working, the position can be prepared in 9.1 hours.

The same two teams will then reposition to BP 107 where they will prepare positions for Tm A(-) which has 9 M2s and 4 M1s. Seven hours is required for the preparation of BP 107. Movement time between positions is estimated to be 15 minutes and each engineer vehicle will require approximately 1 hour of maintenance before moving to the next position.¹⁰

Two other teams will prepare BPs 104 and 108. Since BP 104 also requires 14 M1 positions, preparation time is 9.1 hours. One hour of maintenance time is also required, and movement time to BP 108 is 20 minutes. BP 108 requires 8.5 hours to prepare since it contains only 10 M1s and 4 M2s.

When these calculations are completed, the engineer sites obstacles on the flanks of the EA to canalize the enemy. On each flank, he plans a tank ditch which will force the enemy into the EA. He devotes one team to each tank ditch while his other two teams conduct countermobility and survivability deception measures in support of security operations.

Tank ditch (TD) number 1 will be 1200 meters long. His digging team can dig at a rate of 75 meters per hour. Each three hours of blade time requires 20 minutes of maintenance time. The total time necessary to construct the

obstacle is 17 hours and 40 minutes; $1200 / 75 = 16$ hours +
($16 / 3 = 5$) X 20 minutes = 100 minutes = 1 hour and 40
minutes--total time 17 hours and 40 minutes.¹⁰

TD 2 will be 1000 meters long and requires 14.8 hours to construct. Since these obstacles are designed to canalize the enemy, they are sited where indirect fires as well as direct fire from the battle positions can overwatch them. They must be reinforced with wire entanglements, antitank and antipersonnel mines to make breaching more difficult and time consuming for the enemy.

The engineer company commander considers the number of engineer and infantry platoons available to emplace minefields and wire obstacles. He has 3 engineer platoons and 3 infantry platoons available. The work rate planning factors for these respective elements is based upon standard work rates for the emplacement of minefields and wire entanglements. An engineer platoon can emplace buried mines at the rate of 33 meters per hour and can construct 300 meters of triple standard concertina wire per hour.²⁰ Infantry platoons can work at half the rate if properly supervised. The TF engineer estimates that he can use the three infantry platoons to emplace wire obstacles. Based upon his calculations, three infantry platoons can emplace 3 kilometers of wire obstacles in seven hours.

While the infantry construct the wire obstacles, the 3 engineer platoons will emplace three 1000 meter minefields which will require 31 hours of effort. The actual siting of

the wire and mine obstacles will be determined by the company commanders once they have positioned their forces.

After the engineer has completed his time estimates, he places these on the synchronization matrix to visually show engineer activities in relation to other friendly and enemy activities.²¹ (Figure 5-4)

Figure 5-4

Engineer Activities

	E-30	E-30	E-27	E-24	E-21	E-18	E-15	E-12	E-9	E-6	E-3	E-12	E-30	E-1	E-1:30
TIME	191700			100500				101700		2300	0200		170500	00	0030
E C													1ST ECH	1ECH	1ECH
H O				DIV RECON				COMBAT	NOTL RECON				ARTY PREP	PL	EA
A				PATROLS				PATROLS	PATROLS				JAMMING	ZACK	SILENCE
													SMOKE		
I HAI												HAI 1. 9		HAI 1.5	
H												HAI 2			
T TAI															
E													TAI 4		
L COL				ALL TF ELEMENTS				BP 101/103/SP1				OP 3. OP 2	OP 1.5	OP 3. OP 1	
								LOCATION/TYPER				ENEMY ACTIVITY		2ND ECH	
								CNT ACTIVITY				ON ECH		MOVEMENT	
PIR/IR															
M SEC		2/A	2/C	move/prop	3/A	3/C	move/prop	A.B.C MOVE					SCTS OUT		
A		2/B	2/D	MBA PSXS	3/B	3/D	MBA PSXS	TO MBA					D TO MBA		
H M 1/A		SP move to sec zone	2/A										TM D SET		
E B 1/B		SP move to sec zone	2/B	move to									A.B.C SET		
U A 1/C		SP move to sec zone	2/C	sec zone											
V 1/D		SP	2/D												
E RES															
R															
DEEP															
DEAR															
DEC PTS.															
F 1551051															
I															
E 0' (R)															
E															
MORTARS															
E															
WIRE ENTANGLEMENTS															
M CM															
G															
5 CR															
BP 102															
BP 104															

By having the FSO and engineer officer available during EA planning, indirect and direct fire effects can be synchronized with the engineer obstacle plan to insure

obstacles are placed to achieve the desired results.²²

The air liaison officer (ALO) coordinates with the S-3, S-2, FSO, and the air defense officer to plan airspace coordination areas (ACAs). The S-3 knows that if the TF receives air support during the fight, these ACAs need to be planned and coordinated well ahead of time with the fire support elements. He tells the ALO to plan three ACAs. Two will be planned on the flanks of the EA and one planned deeper in the sector perpendicular to the enemy's line of attack. The ALO divides the airspace allowing attack level (AGL), USAF aircraft to operate between 200 and 500 feet AGL, and the FSO coordinates with the artillery to fire above 500 foot AGL when the ACAs are in effect. The FSO also integrates the high angle mortar fires into the ACA planning to insure this asset can be employed simultaneously with air operations if necessary. Once the ACAs are designed, the information is coordinated through USAF and artillery channels to ensure its dissemination.²³

The air defense officer is involved so he will know where the ACAs are located and approximately when friendly air operations are expected. He communicates this information to his Vulcan and Stinger crews along with code words which will advise them on adjustments to the air defense status.²⁴ In addition, he calculates the amount of time necessary for his elements to reposition and integrates air defense activities at the appropriate place on the synchronization planning matrix. (Figure 5-5)

Figure 5-5

Air Defense Artillery Activities

	B-30	B-30	B-27	B-24	B-21	B-18	B-15	B-12	B-9	B-6	B-3	B-ER B-30	B-1	B-1:30
TIME	191700			180500				181700		2300	0200	170500	00	0030
EC												1ST ECH	1ECH	1ECH
NO				DIV RECON				COMBAT	NOTL RECON			ARTY PREP	PL	EA
A				PATROLS				PATROLS	PATROLS			JAMMING	ZACK	SILENCE
												SMOKE		
I	HAI											HAI 1.5		HAI 1.5
H												HAI 2		
T	TAI													
E												TAI 4		
L	COL			ALL TF ELEMENTS				BP 101/103/SP1				OP 3, OP 2	OP 1.5	OP 3, OP 2
								LOCATION/TYPE				ENEMY ACTIVITY		2ND ECH
								CHY ACTIVITY				ON WTRK		NOTEMST
M	SEC		2/A	2/C	move/prop	3/A	3/C	move/prop	A,B,C MOVE			SCTS OUT		
A			2/B	2/D	MBA PSNS	3/B	3/D	MBA PSNS	TO MBA			D TO MBA		
N	1/A		SP move to sec zone	2/A										
E	1/B		SP move to sec zone	2/B	move to							TM D SET		
U	1/C		SP move to sec zone	2/C	sec zone							A,B,C SET		
V	1/D		SP	2/D										
E	DES													
B														
DEEP	BOE (151 ATK BN)													151/CAS EA
														SWORD
PEAR														
DEC PTS.														
F	155(105)													
I														
E	8" (R)													
E	SPLIT BP 101-													
	MORTARS													
E	WIRE ENTANGLEMENTS													
E	CM MINES													
G	TD 182 W W W W W W													
B	SUR BP 102													
	BP 104													
A														
D	STINGER													
	SET RIDGE W. OF SP 2, BP 108, BP 10													
A														
	VULCAN													
	SET BP 101 & BP 103													

While the S-3 explains how he envisions TF elements will conduct their maneuver, the TF S-2 calculates the fuel and ammunition requirements. He will insure the TF is full of fuel when it completes the relief of the California forces currently withdrawing from the sector. He knows that

the major combat systems will burn approximately 8% of their fuel capacity per hour.²⁶ Armed with this information, he time-lines the fuel consumption rates for each company team and for the other elements of the TF.

LTC Grant has told the S-4 to have assets available to top off each team as they return to final positions in the MBA. The S-4 looks at the planned arrival times for each team in the MBA and determines they will be returning with 40% of their fuel remaining. He knows that each team requires two 2500 gallon HEMTT tankers to top off their vehicles. He calculates that the refueling operation will require 30 minutes per company team.²⁶ Since he has 10 of his 12 authorized tankers available he can accomplish the refueling mission.²⁷

The S-3 informs the S-4 that since each company team will fight a counter reconnaissance battle, he should have enough ammunition on hand to immediately replenish each tank and Bradley fighting vehicle (BFV). Based upon Soviet reconnaissance doctrine, the S-4 knows that each regiment will probably employ up to 20 vehicles in its reconnaissance effort.²⁸ The S-2 briefed that the enemy can attack with two or three regiments in the first echelon, so the S-4 concludes that he should have at least 30 extra tank main gun rounds available per company, 300 rounds of 25 mm and 6 TOW missiles per BFV, and at least 500 rounds of 50 caliber ammunition for each tank. In addition, the S-4 knows that each regiment consists of about 160 combat vehicles and that

on the average every enemy vehicle will be fired at twice.

The S-3 also points out that after the first regiment is defeated, the TF will be prepared to fight the lead elements of a second echelon regiment. With this information, the S-4 determines that he will prestock each BP with an additional 20 tank main gun rounds, 300 rounds of 25 MM and 12 additional TOW missiles per BFV.

The S-4 estimates the amount of time necessary to prestock each position, upload each combat vehicle and refuel each company team. When he completes his calculations, he annotates his required combat service support (CSS) activities on the synchronization matrix. The requirement to prestock each battle position with additional ammunition, will require one truck per BP. The required time to download and prestock each position using three men is estimated at 10 minutes per fighting position. The S-4 allocates two teams from the support platoon augmented by personnel from each company team to conduct the prestock. Refuel and rearm vehicles will move to the battle positions prior to arrival of the company teams and will be prepared to refuel each company team as they arrive. (Figure 5-6)

Figure 5-6

Combat Service Support Activities

	E-30	E-30	E-27	E-24	E-21	E-18	E-15	E-12	E-9	E-6	E-3	E-24 E-30	E-1	E-1:30
TIME	151700		100300					101700	2300	0200	170500	06	0630	
E C												1ST ECH	1ECH	1ECH
B O			DIV RECON					COMBAT	NOTL RECON			ARTY PREP	PL	EA
A			PATL...					PATROLS	PATROLS			JAMMING	ZACK	SILENCE
I	HAI										HAI 1, 5		HAI 1, 5	
N											HAI 2			
T	TAI													
E											TAI 4			
L	COL		ALL TF ELEMENTS					BP 101/103/SP1			OP 3, OP 2	OP 1, 5		OP 3, OP 2
								LOCATION/TTYPE			ENEMY ACTIVITY			2ND ECH
								CHT ACTIVITY			ON WCK			MOVEMENT
M SEC	101	2/A	2/C	move/prep	3/A	3/C	move/prep	A, B, C MOVE						SCTS OUT
A	101	2/B	2/D	MHA PSNS	3/B	3/D	MHA PSNS	TO MHA						D TO MHA
N M 1/A		SP move to sec zone	2/A											TH D SET
E B 1/B		SP move to sec zone	2/B	move to										A, B, C SET
V A 1/C		SP move to sec zone	2/C	sec zone										108
V 1/D		SP		2/D										108
E 105														TH D TO SEC
B														151/CAS EA
DEEP														SMOCD
DEAR														
DEC PTS.														
F 155(DS)														
I														
R 0" (N)														
E														
MORTARS														
E														
WIRE ENTANGLEMENTS														
N CM														
G														
N SUR														
A														
D														
A														
C FUEL														
S														
S														
ARM														

As LTC Grant considers command and control of the fight, he consults with the TF executive officer, the S-3.

and his communications platoon leader. LTC Grant has learned that he can not give every command personally and that he can not control the entire fight. He identifies the decisions which must be made during the battle and assigns responsibility for making them to the team commander who will be in the best position to make the decision. He places the TF main command post (CP) in charge of control processes which include monitoring the reports from higher and adjacent units and receiving and disseminating information as it is received.²² Since the S-3 will be forward with one of the other teams, he delegates specific decisions in that part of the TF sector to the S-3.

Decisions concerning the firing of priority targets are delegated to specific observers who will be positioned to see the enemy forces as they advance. For each decision maker, LTC Grant selects another individual who will be in position to make the decision if the primary decision maker is unable.

To make the deception believable, both the main CP and the command group (Cmd Gp) will be positioned forward. He calculates the movement time and distance, and designates the displacement time for each of his command and control (C&C) elements on the synchronization planning matrix.

The signal officer knows where he must place his retransmission elements to insure the TF can maintain communications with the scout elements once the main body of the TF withdraws to the MBA. He adjusts frequency change

over times to ensure that communications are uninterrupted during the movement of the TF elements. Once all command and control issues has been discussed and sequenced, the major activities are plotted on the matrix. (Figure 5-7)

Figure 5-7

Command and Control														
	B-30	B-30	B-27	B-24	B-21	B-18	B-15	B-12	B-9	B-6	B-3	B-12 B-30	B-1	B-1:30
TIME	191700			180500				181700	2300	0200	170500		00	0630
EC														
EO				DIV RECON				COMBAT	NOGL RECON		1ST ECH	1ECH	1ECH	
A				PATROLS				PATROLS	PATROLS		JAMMING	ZACK	SILENCE	
											SMOKE			
I	NAI										NAI 1, 5		NAI 1, 5	
E											NAI 2			
T	TAI													
E											TAI 4			
L	COL			ALL TF ELEMENTS				BP 101/103/SP1			OP 3, OP 2	OP 1, 5	OP 3, OP 2	
								LOCATION/TYPE			EXEMPT ACTIVITY		2ND ECH	
								CHY ACTIVITY			ON ROCK		MATTMENT	
M SEC	101	2/A	2/C	move/prop	3/A	3/C	move/prop	A, B, C MOVE			SCTS OUT			
A	102	2/B	2/D	MBA PSXS	3/B	3/D	MBA PSXS	TO MBA			TO MBA			
E N 1/A		SP move to sec zone	2/A											
E N 1/B		SP move to sec zone	2/B	move to							TH D SET			
E A 1/C		SP move to sec zone	2/C	sec zone							A, B, C SET			
V 1/D		SP	2/D											
E RES	105													
B														
DEEP														151/CAS EA
REAR														SWORD
DEC PTS.														
F 155(DS)														
I														
B 0'(B)														
K														
MONTARS														
E														
WIRE ENTANGLEMENTS														
N CM														
G														
B SUB BP 102														
BP 104														
A														
B STINGER														
A														
VULCAN														
C FUEL (REFUEL)														
S														
S														
ARM														
C CMD GP														
A														
C														
MATR														

The TF XO and S-3 work out the plan for supervising the construction of the BPs, EA obstacles, and the positioning of the scout elements. Once all the coordination requirements discovered during wargaming have been accomplished, the TF staff and the commander review the synchronization matrix to insure each activity has been thoroughly wargamed and properly arranged in time.

LTC Grant reviews the matrix and directs the staff to prepare the order. While this is being accomplished, the TF commander, team commanders, S-3, and FSO conduct a reconnaissance of the battlefield area.³⁰ During the reconnaissance, the battle positions selected based on a map reconnaissance are precisely sited by the TF commander to ensure all direct fire weapons are oriented on designated target reference points and can fire effectively into the EA.

Company team commanders select individual positions for each vehicle and record the data. They select company target reference points to orient the direct fires of each of their platoons.

When the reconnaissance is complete, all key personnel return to the Main CP and the order is modified as necessary based on the reconnaissance, issued, briefed and rehearsed. The commander directs movement to the battle positions to begin in 4 hours which allows subordinate

commanders time to prepare and brief their plans. LTC Grant also directs that detailed company team and platoon rehearsals be conducted once the TF rehearsal has been completed. He informs his company/team commanders that he will conduct another rehearsal with key personnel in the MBA once he has the TF positioned for the defense within the sector.

Preparations for the defense began almost immediately and the soldiers executed every task assigned as though they had 20 years of experience. LTC Grant visited virtually every position forward in the TF sector while the S 3 and XO supervised activities in the MBA. Company team commanders sited every vehicle personally checking range cards and insuring crews understood their assigned sectors of fire.

LTC Grant was proud of his command as he watched first sergeants check on the troops, inspect weapons and carry out their other myriad tasks. The company team rehearsals LTC Grant observed were conducted with professional efficiency. Every platoon leader seemed to understand all aspects of the mission and had conducted their own wargaming while preparing their positions.

As LTC Grant's tank started to move toward BP 103, he reviewed once more in his mind the TF preparations for the battle so soon to be joined. Had he considered all aspects of this operation to ensure the success of the TF? He mentally examined his command tour up to this point in time.

**Training--TF 1-3 had trained hard. His staff conducted

staff drills and professional development sessions until they were expert in rapidly producing synchronized operations. His subordinate commanders and non commissioned officers were all professionals who learned quickly that second place was another name for loser. They did not settle for anything less than number one, and this feeling was reflected in the soldiers performance.

****Planning--**The TF plan was based on a thorough IPB. The entire staff added their collective knowledge in its preparation. Every possible enemy option was considered and wargamed in detail against the TF's corresponding actions.

****Preparation--**All TF leaders were mentally and physically prepared to lead their men into combat. Detailed reconnaissance had been completed, rehearsals at all levels had been conducted, supervision of all activities by the chain of command had been accomplished.

****Execution--**Knowing that everything possible had been accomplished, and that the TF was very well prepared, LTC Grant almost began to feel sorry for the enemy soldiers about to attack. As he looked out over what would soon be a battlefield, he relaxed and smiled. The enemy forces that enter the TF sector are going to die by the hundreds in the gun sights of TF 1-3. This unit is ready!

Epilogue

The subordinate commanding officers and the battle staff of TF 1-3 performed as they were trained. This group

of officers was well prepared for battle. LTC Grant, like most of our commanders today, did his best to train his men to fight and win the first battle.

As anticipated during planning, the enemy force was deceived, but not for very long. They discovered the deception upon arrival at PL Sawyer, were temporarily confused, but quickly deployed additional reconnaissance elements forward to provide them early warning. Before these reconnaissance elements reached the MBA, the brigade air attack destroyed the second echelon battalions of the lead regiments at the same time the adjacent enemy regiment in the south came under fire. Within 30 minutes of the arrival of enemy reconnaissance elements in TF 1-3's EA, the enemy's main body began to deploy concentrating all of its combat power in the south.

One of TF 1-3's scouts detected this enemy activity and made a single radio transmission which provided adequate time for the TF executive officer to reposition forces to handle this anticipated contingency.

LTC Grant repositioned with elements of team B and observed the devastating effects of their massed direct and indirect fires. Within minutes of their arrival, scores of enemy vehicles were destroyed and burning. The enemy attempted to reorient its attack, but at each turn, more of their force came under intense fire from TF elements.

In an attempt to break contact, one MRB (-) turned north and ran into the direct fires of Tm C. Several enemy

vehicles then turned east and attempted to flee the battlefield, but were chased and destroyed by the faster M1 tanks which placed accurate deadly fire while on the move.

The task force repositioned and fought another major engagement. This time the enemy concentrated a tank battalion in the northern part of the sector. Again, a scout reported that the enemy had reached the decision point (PL Tom) and was attacking north. LTC Grant triggered the move of Team D which occupied its contingency battle position in the north.

The enemy force penetrated the northern portion of the TF defense with one motorized rifle company (MRC), but Team D destroyed the MRC within minutes of the break through.

When the battle was over, the TF assisted passage of the 52d Division's reserve. The defense was over, now it was our turn to use the initiative and pick the time and place of our attack.

The 10 (U.S.) Corps smashed through a lightly defended area in the north of the corps sector and into the flank of enemy follow on forces. The results of the counter offensive so demoralized the enemy, that they completely withdrew all forces from the State of California.

TF 1-3 had planned, prepared, rehearsed, and executed a synchronized fight. Their detailed planning procedures, learned and practiced in training had been successfully applied in combat--the ultimate test of peacetime training.

LTC Grant had insured his TF was prepared for war by demanding that each of his officers have a thorough understanding of all combat activities and an appreciation for the synchronization of these activities in time, space, and purpose. They had indeed learned these lessons well and they had won!

REFERENCE NOTES CHAPTER FIVE

1. *ST 100-9, The Command Estimate.* Command and General Staff College, July, 1988, p. 2-3.

An established procedure in the United States Army permits the use of one third of the available time for planning at higher levels and two thirds at lower levels. Time for execution must be considered when allocating the use of available time. The commander of the TF has conducted planning starting at his defensive objective and worked the plan back to the assembly area.

2. *TC 34-130, Intelligence Preparation of the Battlefield, Coordinating Draft.* December, 1987.

Event templates are considerably more detailed than this short example would indicate. The event template is designed to provide the commander an anticipated enemy attack profile over time looking at the enemy's seven operating systems. For a more detailed discussion of the event template see pp. 100 through 105.

3. *Memorandum from Artillery Center, Subject: Time Standards.* Table A-23, October 31, 1988.

The time standard for firing a priority target is established in Artillery ARTEPS. A priority target has a low time standard associated with it because the exact location is known, computed, and the firing unit is usually laid on the target.

ENDNOTES CHAPTER FIVE

1. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984. Page 5-31 states that Soviet Regimental recon companies may be employed up to 25 kilometers in front of advancing regiments and Division recon elements may operate as much as 50 kilometers in front of the Soviet division. The example provided does not demonstrate Divisional reconnaissance operating in the sector, however they may be employed up to 24 hours prior to the attack of a Soviet division.

2. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 5-21. Soviet division and regimental artillery is doctrinally employed in close proximity to the FEBA. Regimental artillery is generally located within 1-3 kilometers of the FEBA while divisional artillery may be within 3-6 kilometers.

3. *TC 6-71, Fire Support Handbook for the Maneuver Commander*. May, 1988, p. 43. Although counterfire is not the priority for the maneuver battalion FSO, it is the first priority of Headquarters Division Artillery. Each FSO has an implied mission of passing possible counterbattery locations to higher. Since the Brigade FSO must help plan for the employment of fire support assets, he will consider High Value Targets which may include enemy artillery.

4. *FM 44-3, Air Defense Employment, Chaparral, Vulcan, Stinger*. 29 May, 1984, p. 2-23. The attack profile of Soviet helicopters indicates they would attempt to locate and attack the flanks and rear of defending units.

5. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 11-6. Enemy air defense assets (ZSU 23-4) may be employed within 250 meters of first echelon battalions. SA 9s will normally be located to protect the regimental main body and the command post.

6. *FM 100 2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 5-27. Normal assault speed with mine rollers installed is 12 kilometers per hour. The Soviet Army is seeking to increase this to 20 kilometers per hour. Normal movement speed for advancing assault formations is 20-30 KPH.

7. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 7-2. Soviet reconnaissance organizations are doctrinally reinforced with engineer and chemical assets.

8. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 9-19 discusses the volume of

fire Soviets intend to fire on known and templated defensive positions. The TF S-4 knows that to fire concentrations of the magnitude planned would require large prestocks of ammunition.

•. *FM 100-5, Operations*. May, 1986, p. 16. Agility is one of the four ALB tenets. By going through the synchronization process in detail, the commander and key staff officers gain mental agility in knowing approximately how long various activities will take.

10. *FM 90-2, Battlefield Deception, Final Draft*. May, 1987. The definition and objectives of battlefield deception are clearly specified on pp. 1-4 and 1-5.

11. *FM 100-2-1, The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 9-19. Soviet fire planning doctrine calls for massed artillery on platoon strongpoints within company defenses. The number of rounds planned on these positions varies from 330 rounds to 450 rounds delivered over a time span of 30-50 minutes.

12. *FM 5-102, Countermobility*. March, 1985, pp. 37 through 42. Obstacle employment principles clearly state that obstacles will delay enemy forces but are generally not designed to stop him. The amount of delay an obstacle will cause is based upon the enemy's capability to breach the obstacle. If the obstacle is not protected, the enemy will breach more quickly and the amount of effective friendly fire which can be placed on the enemy is reduced.

13. If a unit is equipped with TACFIRE, computing number of rounds to achieve weapons effects is a simple, quick procedure. Units not equipped with TACFIRE use a manual system employing the planning factors from the Joint Munitions Effectiveness Manual. Computation requires considerably more time and human effort. Once the number of rounds has been determined, a firing organization is assigned the mission. The number of rounds is then divided by the number of tubes assigned to fire the mission, and then multiplied times the sustained firing rate for the firing system.

14. This example is not accurate. Exact data is classified, but the figure quoted provides a vehicle for discussing the process of reducing the firing activity to time.

15. *TC 6-71, Fire Support Handbook for the Maneuver Commander*. May, 1988. Sustained rates of fire are contained in the operators manual and are also located on p. 71.

16. FM 100-2-1, *The Soviet Army, Operations and Tactics*. 16 July, 1984, p. 14-3 and 14-4. The engineer officer had templated the enemy's line charge capability, and determined the enemy could possibly breach a single obstacle in 6 minutes. This was his estimate, and he therefore advised the TF commander to build an additional obstacle in depth to gain additional delay.

17. FM 101-10-1/2, *Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987, p. 1-26. These digging rates are based on two pieces of engineer equipment. There are 14 teams in a J-Series heavy division.

18. Computation of movement time was based on distance to be moved and speed the vehicle could achieve. Maintenance time includes time for servicing the engineer system. The amount of time necessary for the maintenance activity will vary based on operators' manual specifications.

19. FM 101-10-1/2, *Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987, p. 1-23.

20. FM 101-10-1/2, *Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987, p. 1-18.

21. The engineer officer must consider the enemy's capability to breach obstacles to help advise the commander how best to employ the few engineer assets available to the TF commander. The engineer officer should assist the S-2 in the IPB process (Phase 5).

22. FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force*. June, 1988. The interaction of staff officers during engagement area planning is not specifically defined in doctrine, but the personnel involved in the planning process is defined on pp. 4-16 through 4-19.

23. TC 6-71, *Fire Support Handbook for the Maneuver Commander*. May, 1988, pp. 51 & 52. Formal Airspace Coordination Areas are coordinated at brigade level or above. Informal ACAs may be planned by battalion. If formal measures are necessary, the TF FSO can request this be accomplished by brigade.

24. FM 44-16, *Platoon Combat Operations Chaparral, Vulcan, Stinger*. 29 May, 1987, pp. 4-17 through 4-19. The ADA officer must be included in the planning process so he can adjust local air defense status. If he knows where and when to expect friendly air employment he can provide protection to the force while he concurrently allows for

safe friendly air operations.

25. FM 101-10-1/2, *Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2)*. October, 1987, p. 2-125. Fuel consumption rates for the modernized force vary depending on its amount of activity. The 8% figure used in this example is an average fuel consumption figure.

26. The refueling operation was computed by taking the amount of fuel in gallons required for each vehicle and then dividing by the Gallon Per Minute (GPM) pumping capability of the refueling system. Each refueling system has one or two outlets. If it has two, it can refuel two vehicles simultaneously, but at half the pumping rate. By multiplying the length of time required to refuel two vehicles by the number of sets of two which must pass through the refuel point, a refuel time is derived. Add positioning time of 2 minutes per vehicle iteration and an estimate of total time can be derived. A better method of arriving at a planning factor for this activity is to practice the operation, time and record it.

27. FM 101-1/1 *Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 1)*. October, 1987, p. 1-215. By Table of Organization and Equipment (TOE) an armor battalion is authorized 12 fuel tankers. Since the TF lost one tank company, the S-4 sent with it two of the fuel tankers. This should be a standard procedure in Armor units.

28. FM 100-2-3, *The Soviet Army, Troops, Organization and Equipment*. 16 July, 1984. The S-4 must consider the threat which will be presented to the TF and plan ammunition expenditures so he can anticipate resupply requirements for class 5. He can gain an appreciation for the number of possible enemy vehicles dedicated to the reconnaissance effort by reading pp. 4-15 and 4-67.

29. FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force*. June, 1988, pp. 2-2 and 2-3. Commanders must make clear distinctions between command and control functions. Unless a commander must personally make a decision, he should designate who the decision maker is and insure the decision maker understands commanders intent for the decision to be made. This underscores the requirement for commanders to be very precise in communicating their intent.

30. FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force*. June, 1988. Reconnaissance by the TF commanders and staff is vital to proper planning and placement of individual fighting systems. This is one of the troop leading procedures specified on p. 2-20.

CHAPTER SIX

Qualitative Analysis of the Synchronization Model and Matrix

Conclusions and Recommendations

Methodology

To assess the quality and applicability of the synchronization model and matrix, a sample of former battalion level or higher commanders, Army doctrinal authors, and CGSC instructors was asked to review and evaluate the first five chapters of this thesis. The individuals asked to respond to chapters 1-5 were identified according to their experience and availability to the author. The forty officers who responded to this request consisted of 15 former commanders, 11 doctrinal authors, and 14 CGSC instructors.

Former commanders at battalion level or above were selected because they could provide comments based on battalion level command experience. Their assessment of the synchronization model and matrix was valuable because they had experience with synchronization training and execution problems and could therefore evaluate the potential use of the model and matrix by field units. Over fifty percent (8) of the former commanders who participated in the survey are currently serving as instructors or doctrinal authors within CGSC.

Doctrinal authors were asked to comment on the matrix

and model because of their vast experience and knowledge concerning Army doctrine and to determine if the products of this thesis had application in future doctrinal publications. In addition, 5 of the 11 the doctrinal authors surveyed were former tactics instructors in the Command and General Staff College and have examined in great detail all the tenets of AirLand Battle to include synchronization. Their critical assessment was necessary to insure the doctrinal fidelity of the model and matrix proposed as a training and execution tool.

Finally, CGSC instructors were selected because they could assess the products potential use in the classroom to assist in the presentation of tactical instruction. Several instructors currently teaching tactics, logistics, and intelligence reviewed the model to evaluate its usefulness as a training vehicle. Since CGSC instructors primarily teach at the division and corps level, their evaluation of the tool spans the tactical levels from battalion through corps.

A total of 12 officers from the Combined Arms Training Activity (CATA), the Center for Army Lessons Learned (CALL), the National Training Center, Fort Irwin California, (NTC), Training and Doctrine Command (TRADOC), 1st Infantry Division, Fort Riley, Kansas, 24th Infantry Division, and the Combined Arms Combat Development Activity (CACDA) were also asked to read the thesis and provide comments. Of these officers, 10 were currently serving or

former battalion level commanders, and were asked to comment on the model from the command perspective.

Each respondent also received a questionnaire designed to elicit specific comments which would help assess the quality of the synchronization model and matrix and provide an indication of its applicability in helping solve the synchronization problem experienced by the U.S. Army. The survey instrument focused on the following eight questions regarding the synchronization model and matrix:

1. How difficult or easy is the model to understand?
2. Is the model more complex than is necessary?
3. Should the model be modified and if so, how?
4. Should Army doctrine be more specific in describing the synchronization process?
5. Should the model be taught in the TRADOC schools, and if so, which schools?
6. Does the model have application at battalion level?
7. Does the model have application above battalion level?
8. Would an understanding of this process help improve tactical planning and execution at battalion through corps level?

The questionnaire (appendix A) was reviewed by a trained research psychologist and was modified based on the comments received. After this was accomplished, the survey was staffed with the Command and General Staff College, Office of Evaluation and Standardization (OES) who made additional recommendations for modification to insure the

survey instrument was not biased. Once these modifications were completed, the survey instrument was staffed through the Director of Academic Operations to OES where permission was granted to survey personnel within the college.

While the above process was being accomplished, personnel to be surveyed were asked by the author if they would read the thesis and participate in the survey. They received a draft copy of chapters one through five of the thesis and then completed the survey instrument.

When the surveys were returned, the responses were reviewed and combined with those of other respondents and grouped according to respondent category. Three categories were used to group respondents; doctrine writers, former commanders, and CGSC instructors. The arrangement of these categories provided the basis for a rapid assessment of the responses from the various viewpoints. (Appendix B).

Analysis of the Survey Results

Of 57 officers asked to evaluate the synchronization model and matrix, a total of 40 officers (70%) completed and returned the survey questionnaire. The rank of those who completed the survey ranged from Major General to Major. Table 6-1 demonstrates the grade structure and specialties represented in the survey sample.

Table 6-1

Survey Sample Grade and Specialties Represented

<u>GRADE</u>	<u>NUMBER RECEIVED SURVEY</u>	<u>NUMBER RETURNED SURVEY</u>	<u>SPECIALTY</u>	<u>NUMBER IN SAMPLE</u>
LTG	2	0		
MG	3	1	INFANTRY	12
BG	1	1	ARMOR	10
COL	12	7	AVIATION	3
LTC	22	17	FIELD ARTILLERY	5
MAJ	<u>17</u>	<u>14</u>	AIR DEFENSE	1
			ENGINEER	1
TOTAL	57	40	CSS (SC 92)	4
			MI	1
			SIGNAL	1
			GENERAL OFFICERS	2

All 40 respondents stated they understood the synchronization model and matrix. Of the 40 respondents, 35 believed that battalion, brigade, and division staff officers could quickly and easily grasp the synchronization model concept and use it in planning tactical operations. In fact, 38 of the 40 respondents believe it is necessary to plan tactical operations in the detail demonstrated in the synchronization model. However, five officers stated the model is not easy to understand because our officer corps has not been trained at the level of detail in all seven battlefield functions necessary to complete the matrix.

The synchronization model appears complicated at first, but 35 of the 40 officers surveyed stated they did not know of a simpler method to synchronize TF operations. Of the five respondents who stated they did know a simpler method, only two mentioned them. One method was to conduct

field training with the unit where unit officers would actually see the relationships applied. The second is a procedure similar to the synchronization model proposed in the thesis. However, rather than using the battlefield functions as the major arrangement of activities, this method uses the five elements of the battlefield framework (Deep Operations, Security Operations, Main Battle Area Operations, Rear Operations and Reserve Operations) with the battlefield functions subordinated within each specific area. For example, the other matrix might look like the one in Figure 6-1.

Figure 6-1

Alternative Matrix Design

Time	
M	ENEMY COA
A	
I	MANEUVER
N A	FORCES
R	
B E	FIRE
A A	SUPPORT
T	
T	CM
L	<u>SURVIVABILITY</u>
E	<u>MOBILITY</u>
	<u>ADA</u>
	<u>CSS</u>
	<u>C&C</u>

The other areas of the battlefield framework would have an identical structure. This is essentially the same synchronization model presented with a different technique of matrix construction, but is logical because it addresses all the same essential considerations as the matrix

presented in this thesis. A limitation to this alternative model is the larger size matrix that results.

To simplify and speed the process of synchronizing combat activities, my thesis stated that common planning factors should be made available to commanders to help them quickly recall how long certain key activities take to accomplish. Of the 40 officers surveyed, 31 agreed with this assertion. However, several officers who did not agree, stated that if published these planning factors would become "cookie cutter" solutions, and that if we used them, we would become too predictable. While there may be some validity in their concern, in effect the US Army has already published planning factors in the form of ARTEP and gunnery time standards. What the Army has not done, is determine which time standards should be incorporated in the maneuver commander's doctrinal guide from all relevant combat, combat support and combat service support ARTEP and gunnery manuals and consolidate them for ease of use.

Automation may be a solution to the problem of maintaining a consolidated set of planning factors. With an automated system, the necessary planning data can be quickly accessed, incorporated into a synchronization planning matrix and then quickly distributed. This may seem like a complicated process, and with the US Army's current systems, it indeed would be complicated. However, of those surveyed, 30 believe that attempts to automate the sending and receiving of the completed synchronization product should be

pursued. Those who disagree generally maintain that battalions function in a time constrained environment and there is no need to complicate the process further by adding the detail of an automated system.

If an automated system is devised, the product must be relatively standard at each echelon. The greatest disagreement noted during analysis of the survey results concerned the design of the matrix. The majority of those surveyed (25) stated they would not modify the arrangement of the matrix at all, but the other 15 had numerous recommendations for modification based on their experiences.

Since the model and matrix may have application at levels of command above battalion, several variations to the matrix may be required. Higher levels of command have many more assets which must be synchronized and therefore a modified matrix may be necessary at these levels. Therefore, the matrix format presented in this thesis should probably be presented to the Army as one of many possible techniques for arranging the combat activities in graphic form.

Before automating the matrix, users in the field should be consulted to determine the best and simplest matrix design. Once the design has been established, the necessary planning factors can be incorporated into the computer system to speed production and dissemination of the completed matrix during operations.

Another factor which may affect the production of an

effective automated aid is current tactical doctrine. The Army constantly develops new terms and incorrectly uses current doctrinal terms. Synchronization is an example. Our doctrinal literature currently is full of examples of inconsistently defined terms. TRADOC schools have recently begun to correct this deficiency, but in some cases the branch schools contribute to the problem.

Thirty-six of 40 officers surveyed agree that doctrine must be more precise in defining the synchronization process; however, six of those who stated it should be more precise believe that the clarification should be written in the tactics techniques and procedures manuals rather than in the basic doctrinal publications.

While some of the synchronization matrix procedures and the matrix itself may be nothing more than one technique for demonstrating the synchronization process, our doctrinal manuals must define and discuss synchronization using standard terms. For example, if synchronization is defined as 'the arrangement of activities' in *FM 100-5*, it should not be defined as 'the sequencing of functions' in another doctrinal manual.

The US Army is a profession. Like the medical profession, we have a lexicon of terms which must convey exact meanings. Doctors do not go from one hospital to another and learn new terms for the parts of the heart. If they did, the operating room would indeed be a confusing place for the new doctor who learned in medical school to

identify the aorta only to arrive at St. Elsewhere, where they call it 'the big blue boy.'

Right now the US Army has a problem with precise definition of terms and it is time to correct this problem. Doctrinal manuals need to define doctrinal terms very clearly, and synchronization is a doctrinal term. The terms used to define synchronization must also be defined in doctrine.

The terms which need to be defined in doctrinal manuals regarding synchronization are battlefield activities, battlefield operating systems (also called battlefield functions), and the term planning factors should be redefined. The terms time, space, and purpose should be clarified in doctrine.

The definition and amplification of these terms should not be an academic pursuit. They define a tenet of our basic Warfighting doctrine. It is time the Army gained an understanding of this doctrinal tenet, and the understanding begins with clear, consistent doctrinal definitions.

The synchronization model presented in chapter three of this thesis defines these terms, but may require amplification. The model and matrix may have application at echelons of command above the battalion level simply because the terms defined in chapter three clarify the definition of synchronization. With one exception, all those surveyed stated that an understanding of the synchronization process

would improve tactical planning from battalion through corps level.

Further, of the 40 officers surveyed, 31 believed the specific methodology described in this thesis was applicable at corps, 35 stated it was applicable at division 36 at brigade, 37 at battalion, and 22 stated it also had application at the company level.

When asked where the synchronization methodology should be taught, all 40 believed it should be taught at CGSC, 33 also recommended CAS², 35 of 40 agreed it should also be taught at the officer advance course (OAC), and 24 believed it should be taught in the basic officer course as well.

Concerning the teaching of the methodology in the Pre Command Course (PCC), respondents generally favored teaching the methodology to battalion, brigade, and general officer Pre Command Courses. 36 of 40 favored teaching the methodology at battalion and brigade while only 30 of 40 favored the teaching of the methodology during general officer PCC.

Conclusions

Based upon the results of the survey, the synchronization model and matrix are relatively easy to understand. Once the model is understood it can easily be applied. There is a requirement to plan tactical operations in the detail described in this thesis. To achieve the

level of coordination and exchange of information necessary for successful TF tactical operations requires an increased level of individual professional knowledge. Doctrinal publications can help clarify synchronization, but need to be more precise and consistent in their definition and application. Before the doctrinal manuals can have an impact, however, the required knowledge level of the officer corps must be identified and improved.

One way to remedy any lack of knowledge is through additional training at unit level. A concurrent measure which must be taken is to improve the knowledge level of officers currently attending TRADOC schools.

Synchronization training involves Army officers of all grades. The second lieutenant who will lead an engineer platoon, a stinger or vulcan section or one who will be charged with the intelligence preparation of the battlefield (IPB) must receive enough synchronization training to help prepare them for their vital roles in the staff planning process at the battalion task force level.

Officer basic courses (OBC) is where the training of our officer corps begins and this is where knowledge of synchronization skills must start. All branch schools have a requirement to teach not only the specific skills of their branch, but also how these skills compliment those of the other branches. This is where the key terms which clarify synchronization must be taught.

Officer advance course (OAC) prepares officers to

serve as unit level commanders and for junior level staff positions. OAC was once nine months long. Officers received more information, but the information they received did not focus on the seven battlefield functions. Rather, it was generally oriented on branch specific skills. This course is an appropriate place to teach synchronization skills that apply to battalion operations.

Since CAS³ is a staff officer development course, they spend little time concentrating on tactical knowledge skills. Because CAS³ is a staff officer's course, the synchronization process should be taught. The only function a battle staff serves in war is to help commanders synchronize combat operations. This is the first time in the education of an officer where all branches are represented and can start learning how the synchronization process functions.

CGSC students receive some synchronization training, but because the college focuses at the division and corps level, they leave Fort Leavenworth with little additional tactical knowledge applicable at the brigade or battalion level.

The synchronization model and matrix is a way to help present all the considerations necessary to synchronize a battle during the planning process. Relationships between staff sections can be vividly demonstrated through the use of the synchronization matrix. Big arrows on a map take on new meaning when all the combat, combat support, and combat

service support activities are analyzed in detail and their associated time considerations are arranged in relationship to one another. The tactical knowledge level of the officer corps can no longer be confined to only branch specific skills. Once individual combat systems knowledge improves, the Army will still be faced with the problem of inconsistency in its application of terms throughout the doctrinal manuals.

This will not be an easy problem to remedy, due to established procedures for publishing doctrine. There is not a defined hierarchy of tactical doctrinal manuals specified, and although there is a logical hierarchy, starting with *FM 100-5 Operations*, and proceeding down to basic platoon level manuals, the publication schedules don't follow this logical arrangement. Consequently, subordinate level manuals frequently are published before higher level manuals. In addition, there does not appear to be a single proponent who checks for consistency between all doctrinal publications. Rather, this currently appears to be a diffused task delegated to numerous proponent schools and various other US Army agencies, violating a basic principle of war-Unity of Command.

Recommendations

After conducting this detailed study of synchronization, I have arrived at a number of recommendations concerning doctrine (which includes TTP),

training, and areas concerning synchronization that require further study.

First, the definitions proposed in chapter three of this thesis appear to be applicable to virtually all levels of command. The definitions for battlefield activities, battlefield functions, and planning factors should be evaluated for possible application in Army doctrine. In addition, the terms time, space, and purpose used in the definition of synchronization should be clarified in doctrine at each level of command.

As stated previously, the synchronization matrix designed for this thesis is one technique applicable at battalion, but there are others which may have more applicability than the one presented. Numerous variations are possible. Because there are so many possible ways to arrange the matrix, and still arrive at the same end, I recommend that the matrices at appendix C and D be considered for inclusion in a battalion level TTP manual rather than in basic doctrine.

The second recommendation concerns training. Since the synchronization model and matrix seem to be a logical method for synchronizing combat activities and visually portraying the necessary command and staff relationships, I recommend it be employed by all TRADOC schools. Synchronization must be taught in all TRADOC officer and senior non-commissioned officer courses.

Officer basic is the right time to present the

definitions for the terms mentioned earlier. The new officer must understand the concept of synchronization and have a basic knowledge of why his unit must attain ARTEP standards. Through a basic understanding of synchronization, the reason becomes clear. At the advance course, the officer should sharpen his tactical skills and learn the time critical skills of the other arms involved in the combined arms battle.

CAS² is the time and place in an officer's education where he should learn to master the synchronization planning process. The synchronization matrix is a tool that may assist in mastering this complex process.

The defensive synchronization matrix (Appendix C) is arranged in a logical planning sequence that follows the same format as the five paragraph field order. By using the defensive matrix as it is currently designed with the battlefield functions providing the format, each staff officer's functional area of responsibility is represented. The offensive matrix (Appendix D) is arranged for utility in planning offensive operations. Only after a student masters the use of the defensive matrix can he fully understand how to employ the offensive matrix.

Recommendations for Further Study

There appears to be a problem with the process of reviewing Army doctrine. Inconsistencies in doctrine result in confusion as new terms emerge and procedures become

obscure. Why does this happen and how can we fix it?

A second related area which requires additional study is the identification of combat activities at all levels of command. In this thesis I have identified some but not all of the activities which must be synchronized at the battalion task force level. The activities at battalion and brigade are essentially the same, and can be measured, but the process becomes more complicated at brigade because there are more resources and consequently more activities that must be synchronized.

At division level and above, the activities are more obscure and much more numerous because the activities which must be synchronized are really groups of subordinate unit activities. For example, at division, suppression of enemy air defense (SEAD) is an activity which involves artillery activities and may include repositioning of forces, prestocking of additional ammunition, site survey, laying in units, and establishment of special radio nets with aviation units.

All the artillery activities are timed events which must occur before the first round is fired, but must be considered when planning a SEAD operation. These activities and many others are applicable at division and corps. A consolidated list organized and arranged using the seven operating systems would be a helpful aid in the planning of division and corps level operations.

There are two possible research questions which might

be pursued. First, is there a comprehensive list of activities defined in Army literature, for corps and division level? Second, should a list of activities be included in Army doctrinal manuals at all levels of Command? If the answer to these questions is yes, and the products of research are incorporated into US Army doctrine, one of the most difficult tasks associated with synchronization planning will have been solved.

APPENDIX A

SURVEY INSTRUMENT (ATZL-SWO-89-01)

RANK

SPECIALTY_____

CURRENT POSITION_____

SIZE OF LAST UNIT YOU COMMANDED (CIRCLE) CO, BN, BDE, DIV

INSTRUCTIONS:

This survey has been designed to provide a basis for the comparison of thoughts between former battalion level and higher commanders, doctrine writers, and CGSC instructors concerning the synchronization model and matrix presented in the attached thesis entitled *Synchronization of Combat Power at the Task Force Level: Defining a Planning Methodology*.

After reading the thesis, please circle the responses of your choice. Additional comments are appreciated but are not mandatory. This questionnaire survey is strictly voluntary.

1. Do you understand the methodology? Yes No

2. Was the methodology easy for you to understand? Yes No

3. Do you believe that battalion, brigade, and division staff officers can easily and quickly grasp this concept for planning? Yes No

4. Do you believe it is necessary to plan operations in this kind of detail? Yes No

5. Do you know of a simpler method to teach staffs how to synchronize their plans? Yes No
If so please describe.

6. Should an effort be made to compile a single source planning factors manual which reduces activities to time for each echelon of command? Yes No

EXPLAIN: _____

7. Should an attempt be made to automate sending Yes No
and receiving the completed matrix?

8. The matrix uses the BATTLEFIELD OPERATING SYSTEMS as the major grouping of activities and displays them over time. Would you include these or any others in the construction of the matrix?

DECEPTION EW CAS BI AI MP SOF NBC

OTHERS -----

9. The matrix places the intelligence BOS (enemy courses of action and intelligence collection) above maneuver. The maneuver forces are arrayed on the matrix within the battlefield framework. Other BOS elements are then ranked as follows: FIRES, ENGINEER, ADA, C3, and CSS. Should this arrangement be modified, and if so what is your recommendation?

YES NO -----

10. Do you think that a deception block is a necessary part of the matrix?

YES NO ONLY AT CERTAIN ECHELONS

Explain -----

11. Should US doctrinal manuals be more YES NO TTP ONLY
precise in describing the synchronization
process at each echelon of command?

12. Do you believe that an understanding of this YES NO
synchronization process and the associated matrix
would assist in improving the tactical planning
and execution of operations at each level of command
Battalion through Corps?

13. At what echelon of command does the methodology have
application? (Circle all applicable levels).

CO BN BDE DIV CORPS

NONE-THIS METHODOLOGY IS NOT SUITED FOR ANY LEVEL OF COMMAND.

14. Assuming that the methodology does have applicability,
where should the methodology be taught? (Circle applicable
schools and courses)

TRADOC SCHOOLS BASIC COURSE ADVANCED COURSE CAS 3 CGSC

PRE-COMMAND BN BDE GOPCC
COURSES

15. What are your thoughts concerning the process which have
not been covered in this brief survey?

APPENDIX B SURVEY RESULTS ON THE

SYNCHRONIZATION MODEL

RESPONSES TO SURVEY QUESTIONS

QUESTIONS	NUMBER IN SURVEY SAMPLE (40)	<u>DOCTRINE</u> (11)		<u>FORMER</u> (15)		<u>CGSC</u> (14)	
		<u>WRITERS</u>		<u>COMMANDERS</u>		<u>INSTRUCTORS</u>	
		YES	NO	YES	NO	YES	NO
1. Do you understand the methodology?	**Sort of (1)	11	0	15**	0	14	0
2. Was the methodology easy for you to understand?		10	1	13	2	13	1
3. Do you believe that battalion, brigade, and division staff officers can easily and quickly grasp this <u>concept</u> for planning?		11	0	12	3	12	2
4. Do you believe it is necessary to plan operations in this kind of detail?		10	1	14	1	14	0
5. Do you know of a simpler method to teach staffs how to synchronize their plans? If so please describe.		2	9*	1	14.	2	12
*DON'T KNOW OF ONE							
6. Should an effort be made to compile a single source planning factors manual which reduces activities to time for each level of command?		9	2	11	4	11	3
7. Should an attempt be made to automate sending and receiving the completed matrix?		9	2	12	3	9	5
9. The matrix places the intelligence BOS (enemy course of action and intelligence collection) above maneuver. The maneuver forces are arrayed on the matrix within the battlefield framework. Other BOS elements are then ranked as follows: FIRES, ENGINEER, ADA, CSS, and C&C. Should this arrangement be modified, and if so, what is your recommendation?		4	7	8	7	3	11

10. Do you think the deception block is a necessary of the matrix?

9	1	6	2	11	0
OACE		OACE		OACE	
1		7		3	

11. Should US Doctrinal manuals be more precise in describing the synchronization process at each echelon of command?

7	1	11	2	12	1
TTP		TTP		TTP	
3		2		1	

12. Do you believe that an understanding of this synchronization process and the associated matrix would assist in improving the tactical planning and execution of operations at each level of command Bn-Corps?

11	0	14	1	14	0
----	---	----	---	----	---

8. The matrix uses the BATTLEFIELD OPERATING SYSTEMS as the major grouping of activities and displays them over time. Would you include these or any others in the construction of the matrix?

DOCTRINE WRITERS							
DECEPTION	EW	CAS	BAI	AI	MP	SOF	NBC
4	1	2	2	1	2	3	3
FORMER COMMANDERS							
DECEPTION	EW	CAS	BAI	AI	MP	SOF	NBC
5	4	5	3	2	2	1	5
CGSC INSTRUCTORS							
DECEPTION	EW	CAS	BAI	AI	MP	SOF	NBC
12	3	3	2	2		1	5

13. At what echelon of command does the methodology have applicability.

DOCTRINE WRITERS					
CO	BN	BDE	DIV	CORPS	NONE
8	10	10	11	11	
FORMER COMMANDERS					
CO	BN	BDE	DIV	CORPS	NONE
6	14	14	11	9	
CGSC INSTRUCTORS					
CO	BN	BDE	DIV	CORPS	NONE
8	13	12	13	11	

14. Assuming that the methodology does have applicability, where should the methodology be taught?

DOCTRINE WRITERS

BASIC COURSE	ADVANCED COURSE	CAS 3	CGSC	ALL TRADOC
6	9	9	11	SCHOOLS
PRE-COMMAND COURSE	BN	BDE	GOPCC	NOT IN PCC
	8	8	6	3

FORMER COMMANDERS

BASIC COURSE	ADVANCED COURSE	CAS 3	CGSC	ALL TRADOC
8	13	11	15	SCHOOLS
PRE-COMMAND COURSE	BN	BDE	GOPCC	
	15	15	11	

CGSC INSTRUCTORS

BASIC COURSE	ADVANCED COURSE	CAS 3	CGSC	ALL TRADOC
10	13	13	14	SCHOOLS
PRE-COMMAND COURSE	BN	BDE	GOPCC	
	13	13	13	

APPENDIX C BATTALION DEFENSIVE SYNCHRONIZATION MATRIX

H-HOUR TIME LINE OR KEY EVENTS

TIME

I E C

N W O POSSIBLE ENEMY COURSES OF ACTION

T A

E

L

N SEC

A

N M

E B

U A

V

E RES

R

DEEP

REAR

DP (DECISION POINTS)

TAI (TARGET AREAS OF INTEREST)

COL (COLLECTION ASSET TASKED TO OBSERVE DP OR TAI)

PIR/IR (COMMANDER'S INFORMATION REQUIREMENTS-WHAT THE COLLECTION ASSET IS LOOKING FOR)

DECISION (WHAT THE COMMANDER'S DECISIONS MIGHT BE IF INTEL COLLECTOR SEES WHAT COMMANDER WANTS TO KNOW)

F 155(DS)

I

R 155(R)

R

MORT

R MOB

N

G CM

R

SUR

A

D STINGER

A

VULCAN

C FUEL

S

S FIX

ARM

C CMD GP

&

C MAIN CP

CBT TMS CP

NOTES:

APPENDIX D BATTALION OFFENSIVE SYNCHRONIZATION MATRIX

H-HOUR TIME LINE OR KEY EVENTS

TIME

M SEC

A

N MA

K

U SA

V

R RES

R

DEEP

REAR

I E C

H O

H A

T DP (DECISION POINTS)

E TAI (TARGET AREAS OF INTEREST)

L COL (COLLECTION ASSET)

PIR/IR (COMMANDER'S INFORMATION REQUIREMENTS TO HELP HIM MAKE THE DECISIONS)

DECISIONS (COMMANDER'S DECISION OPTIONS BASED ON INFORMATION RECEIVED)

F 155(DS)

I

R 155(R)

K

MORT

K MOB

N

G CM

R

SUR

A

D STINGER

A

VULCAN

C FUEL

S

S FIX

ARM

C CMD GP

A

C MAIN CP

CBT TNS CP

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