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DIRECT SUPPORT (PLUS)

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A Monograph  
by  
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Field Artillery



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First Term AY 90-91

Approved for Public Release; Distribution is Unlimited

91

91-03586



# REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

<b>1. AGENCY USE ONLY (Leave blank)</b>	<b>2. REPORT DATE</b> 22 / 01 / 91	<b>3. REPORT TYPE AND DATES COVERED</b> MONOGRAPH	
<b>4. TITLE AND SUBTITLE</b> DIRECT SUPPORT (PLUS) (U)		<b>5. FUNDING NUMBERS</b>	
<b>6. AUTHOR(S)</b> MAJ PETER E. HAGLIN, USA		<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> SCHOOL OF ADVANCED MILITARY STUDIES ATTN: ATZL-SWV FORT LEAVENWORTH, KANSAS 66027-6900 COM (913) 684-3437		<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>		<b>11. SUPPLEMENTARY NOTES</b>	
<b>12a. DISTRIBUTION/AVAILABILITY STATEMENT</b> APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.		<b>12b. DISTRIBUTION CODE</b>	
<b>13. ABSTRACT (Maximum 200 words)</b> SEE ATTACHED			
<b>14. SUBJECT TERMS</b> ARTILLERY COMMAND AND CONTROL COMMAND RELATIONSHIPS OPERATION URGENT FURY		<b>15. NUMBER OF PAGES</b> 50	
		<b>16. PRICE CODE</b>	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> UNCLASSIFIED	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> UNCLASSIFIED	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> UNCLASSIFIED	<b>20. LIMITATION OF ABSTRACT</b> UNLIMITED

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This study investigates the command and control structures and relationships that best support the AirLand Battle Future (ALBF) Concept by focusing on one type organization doing a representative mission. Specifically, this study discusses command and control of close support artillery in a combined arms maneuver brigade (CAMB). The mission is to expand a lodgment.

This monograph introduces the AirLand Battle Future concept and relates it to the 1986 AirLand Battle Doctrine. In order to enhance this continuity between the futuristic concept and today, the 199th Separate Motorized Brigade (SMB) is introduced as the surrogate for the combined arms maneuver brigade. This organization is relatively new to the Army force structure. It encompasses many of the attributes of organizations envisioned by the ALBF concept. However, unlike the ALBF concept, the 199th SMB is a reality today. This makes the 199th SMB a good vehicle for studying C<sup>2</sup> of close support artillery.

Different command and control options, including direct support, organic, and direct support (plus), are defined and discussed. Two historical examples, Inchon and Grenada are used to illuminate issues for further analysis.

The Wass de Czege Combat power Model is used to analyze the different command and control options against criteria developed from the AirLand Battle tenet, agility. The criteria include the ability to *act quickly, shift the main effort, change missions, and maximize pre-battle training*. The results of the analysis indicate that the direct support (plus) option is superior for providing agile close support field artillery. This information is summarized in the conclusions portion of the paper. Implications are also developed from the study which indicate that now may be the opportune time to fully develop the direct support (plus) doctrine and implement it without waiting for full development of the AirLand Battle Future concept.



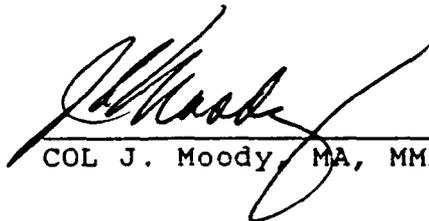
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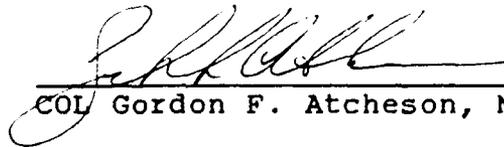
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Title of Monograph: Direct Support (Plus).

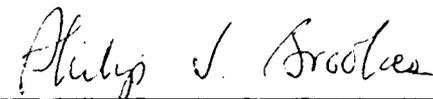
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Accepted this 30th day of January 1991.

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## I. INTRODUCTION

*The fundamental tenets of AirLand Battle Doctrine describe the characteristics of successful operations.*<sup>1</sup>

FM 100-5

The fundamentals of the world's geopolitical makeup are beginning to change at an extremely rapid and unpredictable pace. These changes are shaking some of the precepts upon which the Army has developed its past doctrine, force structure, and training. Europe is no longer the dominating centerpiece for the Army's developmental efforts.

The Army has chosen to conduct its newest combat development activities with an eye to this global state of change. The framework for these activities is a concept known as AirLand Battle - Future (ALBF).<sup>2</sup> This concept provides an azimuth for doctrine, organization, training, materiel, and leader initiatives as the Army moves into the 21st Century.<sup>3</sup> By design, this concept is broad in scope and general in terms.

The ALBF concept proposes that the future Army will fight as combined arms maneuver brigades (CAMB) under the leadership of a division headquarters. The division headquarters itself is designed primarily as a warfighter.<sup>4</sup> The decision to fight as CAMBs has fundamental impacts on how the Army will train, equip, and fight. Therefore, the decision deserves the closest analysis in all its facets and implications.

Command and control (C<sup>2</sup>) is one facet which is central to the entire ALBF concept. Within C<sup>2</sup>, there are a myriad of implications which relate directly to the CAMB decision. One such implication is the adequacy of current C<sup>2</sup> doctrine for combat support assets. How important can doctrine be in this, the "Technology Age?" Martin Van Creveld observed:

*Napoleon, it will be remembered, was able to revolutionize war by employing organizational and procedural means in order to overcome and transcend the limits imposed by the technology of the time.<sup>5</sup>*

This paper will analyze some of the C<sup>2</sup> implications of ALBF to develop organizational and procedural means that will be of use to the Army's divisions and CAMBs. Specifically, this paper will address the command and control of the CAMB close support field artillery assets. The objective is to identify and develop organizational and procedural means that, if implemented, will result in a more powerful force.

These "means" will be addressed within the context of a mission that a brigade will likely receive in the event of hostilities. The reason for this is to try to avoid the pitfall of making an analysis based on a scenario that is unlikely to occur. An inappropriate scenario could skew the analysis results toward an improper set of conclusions.

The conduct of the analysis itself centers on two

vignettes taken from the United States' more recent major actions, Korea and Grenada. These actions encompass many of the conditions that have remained relatively constant over the history of modern warfare. As successful operations, this constancy also extends to include the tenets of the Army's AirLand Battle doctrine.

The AirLand Battle (ALB) tenets of *synchronization*, *initiative*, *depth*, and *agility* remain descriptive of successful operations like the battles noted above. The tenets should remain just as appropriate for the actions envisioned by the ALBF concept. Trying to discuss the central theme (C<sup>2</sup>) of this paper in terms of each of the tenets is too much, however. The problem is that the ALB tenets encompass so much collectively that this monograph effort would fail to transcend general platitudes without some sort of additional focus. This additional focus comes from choosing the one tenet most central to a C<sup>2</sup> theme. The central issue for this paper lies within the cybernetic domain of command and controlling fires. Therefore, this paper will deal with the tenet which is most central to this theme - Agility.

Agility is defined by FM 100-5 as "*the ability of friendly forces to act faster than the enemy.*"<sup>6</sup> Acting faster, as well as the other components of agility found in FM 100-5, provides good criteria for evaluating different command and control options. These other

components of agility are *acting without hesitation, shifting the main effort quickly, and maximum pre-battle training*. I will use these components of agility as the criteria for judging the combined arms maneuver brigade's command and control of its field artillery.

The agility criteria will be applied to help determine the relative strengths of three command and control options. In order to do this, I will use the combat power model developed by Brigadier General Wass de Czege to define the attributes that make up successful C<sup>2</sup>. The Wass de Czege model also helps to structure a direct comparison between C<sup>2</sup> options. The model portrays the contribution that each option makes to the overall strength of the force's combat ability.

For this study, the three options include the currently used *Direct Support - DS*, the simple *Organic*, and the new proposal from the ALBF concept, *Direct Support (Plus) - DS(+)*. The results from the analysis of these options will indicate which C<sup>2</sup> option best suits the CAMB needs.

This paper is organized to introduce first the general topic, the general analysis components, and then the specific research question. After this introduction, Part II includes the concepts and some detailed background that frames the tactical C<sup>2</sup> issues. This part will include more detailed discussions of the ALBF

concept and the methodology for analysis. Part II also describes and defines the C<sup>2</sup> options that are currently under consideration for implementation with ALBF. Part II concludes with two historical vignettes that spotlight key C<sup>2</sup> issues. These issues will help focus the quantification process in the remainder of the paper.

Part III of this paper contains the analysis of each of these C<sup>2</sup> options introduced in Part II. The analysis builds on the historical vignettes based on the application of the Wass de Czege Combat Power Model. The results of the analysis include tabulated comparisons of the different options which lead to interesting conclusions and implications.

Part IV articulates the conclusions and implications derived from the analysis. These results are specific and based on the research question:

*How should the command and control of close support field artillery battalions be structured to support ALBF inspired combined arms maneuver brigades as they conduct the mission to expand the lodgment?*

This paper will answer that question by examining past battles and applying the criteria associated with the ALB tenet of agility. The objective of the paper is to develop and define the C<sup>2</sup> option which contributes most to the combat power of the ALBF force as a whole.

## II. CONCEPTS AND BACKGROUND

*...it was a question above all of making such flexible use of one's resources as to outnumber the enemy at any given point.<sup>7</sup>*

*Van Crevel'd*

The structure of this part of the paper is fairly complex. I will begin by addressing some fundamentals of ALBF and the force structure that it is spawning. I will also propose a mission that the CAMB must be prepared to execute. I will detail the criteria and the specific C<sup>2</sup> mission relationships that will be analyzed later in Part III. Finally, I will introduce two vignettes to relate the ALBF force structure and missions to an historical framework. The vignettes will serve also to illuminate issues for the analysis in Part III. But before proceeding further, I must begin with discussing the basic ALBF concept.

When the AirLand Battle doctrine of FM 100-5 was written, the bulk of United States ground forces was oriented toward fighting a major war on the European continent against the forces of the Warsaw Pact.<sup>8</sup> The prospect of undertaking this formidable task required the design of a doctrine which made full use of every facet of each combat unit's strength. The tenets of agility, depth, synchronization, and initiative were born. They were the plan for being able to fight outnumbered and to win. Today, these tenets are still just as valid, even

without the onus of approaching battle with the Warsaw Pact. This will remain so into the future.<sup>9</sup> A unit should be able to measure its capabilities against these tenets to validate its potential for successful operations in "future" battles.

The rapidly changing political landscapes in Europe, the Middle East, South and Central America, and Southwest Asia have significant, and probably unpredictable, effects on the United States and the Army over the next decade. One of the first changes that *will* be seen in the way the Army conducts business in the decade of the 1990's is where the Army will be based.<sup>10</sup>

Basing for the Army has been heavily forward deployed to conform with the national strategy of containment. However, containment as a strategy is in the process of being logged onto the inactive rolls of interesting history. In its place will stand a new set of international policy strategies that are just now taking shape in terms of both rhetoric and action. For the Army, one of the first casualties of this change is the forward basing of large, armor heavy, troop formations.

The confluence of huge budget deficits, a less immediately threatening Soviet Union, and the re-creation of a united Germany under the NATO Alliance has resulted in an opportunity for the United States to withdraw the bulk of its forward deployed units from Europe.<sup>11</sup>

Contingency forces, based in the United States, will replace these units. Strategic deployability will be a key design restraint which will manifest itself in fewer "main battle tanks". The concept for AirLand Battle - Future accommodates these global and national conditions and provides an azimuth for future combat developments.<sup>12</sup> The first task for this paper is to translate this azimuth into a specific organization and mission.

The force structure that I will use is one of the first organizations designed to reflect the expanded requirements for strategic mobility. It is the 199th Separate Motorized Brigade (SMB) being organized at Fort Lewis, Washington. While not designed specifically as an ALBF unit, the 199th SMB meets many of the ALBF design parameters as a strategically deployable, combined arms maneuver brigade capable of "plugging into" a divisional headquarters. This brigade is designed to contain enough tactical mobility and combat power to be able to perform the independent missions which are implied in the ALBF concept.<sup>13</sup> The particular focus of this paper is on the strengths of the C<sup>2</sup> relationships between the brigade headquarters and its field artillery.

I will use the 199 SMB force structure as the base line CAMB to examine the question of how best to organize its C<sup>2</sup> of the artillery. This examination will be

conducted within the context of a mission that a CAMB can expect to receive after a force(d) entry. That mission is to "Expand the Lodgment".

In the event of hostilities, contingency forces will, by design and geographic necessity, begin operations with a strategic move into a designated lodgment area. This lodgment will be either an airhead or a beachhead, depending on the transportation assets used.<sup>14</sup> What will not change due to mode of transportation is the necessity to transition from the strategic movement to tactical operations.

That transition will take place at the lodgment regardless if it is an airfield or a sandy beach. The tactical operations that facilitate this transition take place under the mission to expand the lodgment. This mission is normally conducted to provide the incoming force the security and real estate required to continue to build up its forces before the initial ground operations begin. Time has changed the urgency of the "Expand" mission.<sup>15</sup>

In today's world of massed vehicles, the lodgment must be expanded quickly just to provide the ground and port facilities to off-load the equipment. Then facilities must be successfully protected themselves. The physical requirements needed to park the divisions' worth of material as it is assembled for future operations

demands even more space. Finally, many third world countries now hold sophisticated weapons, munitions, and delivery capabilities that can threaten the lodgment's security from far beyond what has historically been a relatively close-in perimeter defense.<sup>16</sup>

For the purposes of this document, the 199th SMB will be given the expand the lodgment mission to perform as the vanguard of inbound units still conducting the strategic movement. The mission is consistent with the American military experience. That experience provides numerous examples to use as comparisons and insights.

I will examine two separate instances of American units given a like mission to Expand a Lodgment; Inchon and Grenada. The units involved range in size from brigade through division. Both Army and Marine units will be included in the analysis to ensure that the best of the tactics, techniques, and procedures used by both type forces are assessed.

Capturing different tactics, techniques, and procedures is a fairly easy process. The hard part is deciding which are "the best". The key is defining appropriate criteria. For these criteria, I refer back to the AirLand Battle tenet of agility. The need for agility is a trait common to both the Inchon, Grenada, and the ALBF concept. But a unit must meet several criteria before it passes as an agile force.

"Acting faster" is the first of these and is also "the first prerequisite for seizing and holding the initiative."<sup>17</sup> For a unit to capitalize on its inherent agility, that unit must be able to "act without hesitation."<sup>18</sup> This means that the unit must be able to accept the instructions of its leadership and act on it without pause.

Agility also requires a unit to be able to shift "the main effort with minimum delay and with the least possible necessity for reconfiguration and coordination."<sup>19</sup> The unit must also adapt to changing requirements. This has implications both for the unit itself, its organic subordinates and its parent headquarters. Higher and lower echelons must be organizationally adept and operationally trained in shifting the main effort. The echelons must also be organizationally balanced in order to change missions to accommodate changing requirements. The problem is that acting fastest, shifting the main effort, and being able to rapidly change missions are not instinctive skills.<sup>20</sup>

There is a fourth criterion that must be met to be successful. That criterion deals with training. Current doctrine recognizes that the best way to build better agility is through aggressive pre-battle training. This training encompasses both individual training and unit

training. Some C<sup>2</sup> options facilitate better pre-battle training than other options.<sup>21</sup> Therefore, training must be considered as a criterion just like the other components of agility.

These four criteria for agility, act fastest, shift the main effort, change missions, and maximize training, all serve to focus on the C<sup>2</sup> system's overall contribution to combat power. For this reason, agility occupies the position of primacy for designing and evaluating the field artillery command and control structure. The only remaining problem is the problem of judging and comparing the C<sup>2</sup> options in any terms more specific than general platitudes. Because the cybernetic domain resists accurate physical measurement, it is very difficult to arrive at any sort of comparison based on quantifiable inputs. The best we can do is a comparison based on relative values.

One way to judge relative worth is to use a model designed to quantify relative contributions to combat power. The Wass de Czege Combat Power model is useful for this purpose.

I will apply some of the cybernetic attributes of the Wass de Czege Combat Power model against the C<sup>2</sup> options in order to compare relative contributions to combat power. These attributes include span of control, standard operating procedures, doctrine, staff

efficiency, communications efficiency, leadership technical proficiency, and leadership understanding of unit capabilities.<sup>22</sup> In order to translate combat potential into combat power, the "best" command and control structure maximizes its abilities in each of these areas. The attributes can then be measured against the agility criteria to produce a measure of relative agility between the C<sup>2</sup> options. This completes the formal analysis process.

Now that the analysis process is fairly well defined, there still is a requirement to rigorously define the three command and control options that are available for examination. These options are a mix of the traditional as well as the new. Taken together, they form an array of options which are all potentially successful. The purpose of the paper includes identifying which one is "best". I will start with the most familiar option in today's doctrine.

*DIRECT SUPPORT (DS).* Today, a field artillery battalion providing close fire support to a maneuver brigade is assigned to a division artillery and given a mission of *direct support*. The mission and relationships are clearly defined and understood to encompass the inherent responsibilities that are depicted at Figure 1. These inherent responsibilities provide the best vehicle for explaining the differences between the three command

and control options. Because *DS* is the current method for structuring close support of field artillery, it will be used as the base for discussing command and control options.<sup>23</sup>

Two categories within the *DS* inherent responsibilities will receive special treatment. They are the items which change from option to option. The categories are priority for answering calls for fire and positioning authority.

DIRECT SUPPORT	
Answer calls for fire in priority from:	1. Supported unit. 2. Own observer. 3. Force FA HQ.
Have zones of fire:	Zone of action of supported unit.
Furnish FIST/FSO:	Provide temporary replacements as req'd.
Furnish LNO:	Not required.
Establish communications with:	FSOs and supported maneuver unit HQ.
Is positioned by:	DS FA unit commander or as ordered by force FA HQ.
Has its fires planned by:	Develops own fire plans.

FIGURE 1

For an artillery battalion given the mission of *DS*, these two categories really impact on how the control of

fires is structured. First, the priority for answering calls for fire lists three elements in order, the supported unit, the artillery battalion's own observers, and finally, the force artillery headquarters. This means that while the supported unit gets its calls for fire answered first, the calls for fire from the artillery "higher headquarters" still get answered on an as available basis.<sup>24</sup>

Second, the implications of positioning authority impact directly on the control of fires. In the *DS* option, the artillery battalion is positioned either by its own commander or as ordered by the force artillery headquarters. This codifies a major source of control that the artillery "higher headquarters" holds over the close support artillery battalion. By regulating when and, to an extent, where a battalion is positioned, a force artillery headquarters can greatly affect when massing of fires can take place and which zones of action are covered by those massed fires.<sup>25</sup> This option is the model for today's standard close support artillery battalion.

*ORGANIC.* The artillery battalion supporting the 199th SMB is organized under the *organic* option. The artillery battalion which is *organic* to a maneuver brigade has the most simple and unambiguous command and control option. The table at Figure 2 provides the

inherent responsibilities that the battalion would be expected to fulfill.<sup>26</sup> Once again, the responsibilities are straight forward. The two categories highlighted in the discussion of the *DS* option change for the *organic* option. Calls for fire from the supported unit are answered first. Calls for fire from the artillery battalion's own observers are answered second.

ORGANIC	
Answer calls for fire in priority from:	1. Parent unit. 2. Own observer.
Have zones of fire:	Zone of action of parent unit.
Furnish FIST/FSO:	Provide temporary replacements as req'd.
Furnish LNO:	Not required.
Establish communications with:	FSOs and parent maneuver unit HQ.
Is positioned by:	FA unit commander.
Has its fires planned by:	Develops own fire plans.

FIGURE 2

There is no "force artillery headquarters" as a higher headquarters to an artillery battalion organic to a maneuver brigade. Therefore, there is no third priority for calls for fire. There is no other agency embedded in

the formal call for fire priority structure. Hence, the supported maneuver brigade can expect to receive the benefit of almost all the fires delivered by its *organic* artillery battalion.

There is a cost to this benefit. External fire support agencies will find it almost impossible to utilize these artillery fires during times that they might otherwise be available.

Positioning authority rests solely with the artillery battalion under the *organic* option. This allows the artillery battalion to position itself to maximize its close support for its parent brigade. It also allows the battalion to displace and move to support only its maneuver brigade. Streamlined responsibilities simplify positioning decisions, but also decrease the ability of an external fire support agency to influence massing of fires. A division artillery cannot position this battalion in advance or regulate displacements and moves during the battle. The resulting ability to mass fires within the division zone is thereby reduced.

*DIRECT SUPPORT (PLUS)*. The third option for structuring the command and control relationship of the close support artillery battalion stems from the ALBF concept itself. Known as *DS(+)*, this relationship attempts to find a middle ground between the streamlined but inflexible *organic* and the more flexible but somewhat

less responsive *DS* options.<sup>27</sup>

As in *direct support*, the artillery battalion is assigned to the division artillery. The artillery battalion is given the mission of *DS(+)* which carries with it the inherent responsibilities listed in Figure 3.

DIRECT SUPPORT (PLUS)	
Answer calls for fire in priority from:	CAMB commander.
Have zones of fire:	Zone of action of supported unit.
Furnish FIST/FSO:	Provide temporary replacements as req'd.
Furnish LNO:	Not required.
Establish communications with:	FSOs and supported CAMB unit HQ.
Is positioned by:	CAMB commander.
Has its fires planned by:	Develops own fire plans.

FIGURE 3

There are two significant changes from the traditional *DS* option.<sup>28</sup> Under the *DS(+)* option, both the priority of calls for fire and positioning authority rest solely with the commander of the combined arms maneuver brigade. There is no direct provision for a force artillery headquarters to affect either area of responsibility.

This has the immediate result of ensuring that the close support fires go to the supported CAMB. The CAMB commander will not routinely lose his artillery assets to another force only to get his unit back later, low on fuel, bullets and mission capability.

Beside the assigned relationship to DIVARTY, *DS(+)* differs from *organic* in that it does provide specifically for the division commander to "command override" for shifting and massing organic field artillery fires. This command override rests solely with the division commander and is implemented through the DIVARTY.<sup>29</sup> Thus, the ALBF option walks the middle ground between the first two options. Centralized tactical control rests with the maneuver commander. Command remains with the division artillery. The benefit is that the division retains some ability to mass fires, even though it may also be necessary to issue repositioning instructions on occasion.

Given the three structures listed above as options for the command and control structure of the close support field artillery, I will now examine them in historical settings. This will serve to isolate issues which spotlight insights for analysis of which C<sup>2</sup> option is best.

The expand the lodgment mission has been conducted many times over the course of history. The two vignettes

that serve this paper are drawn from Operation Chromite of the Korean War and Operation Urgent Fury on the island of Grenada. Overall, both are categorized as successful operations. However, each has its own select group of positive and negative lessons to be learned.

#### *OPERATION CHROMITE.*

*A proper command system should be able to set itself goals, and then strive to attain those goals in spite of the clear realization that things will go wrong...30*

*Van Creveld*

The amphibious landing at Inchon, Korea was a joint and combined operation. It pitted Army, Marine and Republic of Korea forces against the coastal defenses of an over-extended North Korean army. The success of the operation makes it an ideal candidate for study of lodgment operations.

The amphibious assault of Inchon began on 15 September, 1950. The 1st Marine Division attacked with two Marine regimental combat teams (RCTs) conducting the initial assaults.<sup>21</sup> The force was supported by a Marine artillery regiment and one additional Army artillery battalion. One Marine artillery battalion was placed in direct support of each assaulting RCT. The division's other regimental combat team (7th Marine RCT) was not scheduled to land until 21 September. Initially, the 7th RCT was still given an artillery battalion in direct

support. This artillery battalion deployed under its parent artillery regimental headquarters. Later, when the 7th RCT was deleted formally from the Inchon troop list, the artillery battalion participated in the operation alongside the artillery regiment's other battalions.<sup>32</sup>

After successfully seizing the beachhead, the 1st Marine Division transitioned to the mission to expand the lodgment on 17 September. The "expand" mission began with the move inland to seize Kimpo Airfield. The mission lasted until Yongdungpo was seized and the Han River crossed.<sup>33</sup> The 1st Marine Division began the mission with no change to its field artillery command and control. By 18 September, a new force was introduced on its flank - the Army's 7th Division.

The 7th Division moved up the southern flank of the 1st Marine Division and began to establish liaison. As the two forces adjusted to each other's way of operating, matters generally went well. This included some fire support, especially air support which was provided for the Army units by the 1st Marine Aircraft Wing. The support was so good that the 7th Division Artillery Commander recommended adopting the Marine procedures as the standard for the Army.<sup>34</sup>

One incident was not so good, however. During the approach to Yondungpo, members of the Marine 1st Regimental Combat Team requested fires across their

boundary and into the 7th Division zone. There was no structured method for getting massed fires onto the out-of-zone targets except to go back up through 1st Marine Division to X Corps and then down through the 7th Division. After several hours of watching elements of the North Korean Peoples' Army dig in, the Marines learned that the requests for fire were denied. No massed field artillery fires ever engaged those targets.<sup>35</sup> This clearly demonstrates what can happen when artillery, assigned to one headquarters, has no structured mechanism for answering calls for fire from another headquarters.

These snapshots of a complex operation bring out two important issues. First, because the Marine artillery battalions were given the mission of direct support to the RCTs, the artillery regiment remained intact and in support of the division. This method of structuring C<sup>2</sup> saved the command from losing an artillery battalion even after one of the RCTs was dropped from the troop list.

Secondly, the structure to provide massed fires in "adjacent" zones must be clearly delineated. This includes embedding flexibility into doctrine at every opportunity. The expand the lodgment mission at Inchon was originally conceived as a relatively independent operation for both the Marines and the Army. Even so, fire missions requiring massed, coordinated fires still occurred. This will occur in future conflicts as well.

*OPERATION URGENT FURY*

*Pronouncing judgment over historical events is something never to be lightly undertaken, especially when, as in this case, the events are still quite recent and controversial.<sup>36</sup>*

*Van Creveld*

Much of the historical information surrounding the precise orders and the tactical planning of Operation Urgent Fury remains classified and therefore not suitable for inclusion in this study. Some information is available through interviews of the participants. Even though these interviews are incomplete, several key issues still emerge. These issues are also in consonance with the experience from Korea.

Some thirty three years after the Inchon Invasion, the United States Army was again conducting a lodgment mission. This time the invasion and lodgment was conducted on the tiny island of Grenada. Instead of multiple divisions landing over beaches, the scale of Operation Urgent Fury was proportionally smaller as elements of the 82d Airborne Division made up the bulk of the land forces.

Like the Marine artillery at Inchon, the close support assets for the 82d Division were assigned to the division artillery and given the mission of direct support to the division's maneuver brigades.<sup>37</sup> What is different about the C<sup>2</sup> of artillery during Urgent Fury is the fact that the artillery unknowingly came very close

to what ALBF now calls *Direct Support (Plus)*. There is some confusion over the precise language used in establishing the operation's command and control relationship between the close support artillery and the supported brigades. In the opinion of several key leaders, the initial move of artillery units to Grenada was conducted as "attached" to the maneuver brigades. To others, the artillery was simply placed in *direct support* to the brigades.<sup>38</sup> This had the effect of moving the command and control relationship even closer to the brigades than the habitually associated *direct support*. Whether the artillery units were formally attached or placed in *direct support* to the maneuver brigades is not really important. What is key is the fact that all the commanders involved were comfortable in the utility of the closeness of the command and control structure. This is a reflection of the training that was habitually conducted at Fort Bragg.<sup>39</sup>

Another remarkable thing about this operation from the standpoint of the participating brigades is the operation's compressed emergency deployment time schedule. In an alert sequence that was supposed to allow for set periods of time for planning, packing, and loading, the initial elements of the 82d Division were deploying much earlier.<sup>40</sup> The supporting artillery was still fully integrated into this more rapid deployment.

As such this integration is a testament to the agility of the units' C<sup>2</sup> structure. There was no confusion over the inherent responsibilities which were incumbent on the artillery to meet. There was no debate over who had positioning authority and what the priorities for calls for fire were. In both cases, the maneuver brigade called the shots.<sup>41</sup> In the final analysis, this deployment was a success. The deployment points out some of the strengths that accrue from a C<sup>2</sup> relationship that approaches *DS(+)*.

Now that the deployment has been scrutinized, the focus of the vignette shifts to the expand the lodgment mission itself. The Salines Airfield itself was essentially secure after three enemy BTR-60 armored vehicles attempted a limited counterattack against the lead elements of the 82d Division on the airfield. The vehicles were destroyed.<sup>42</sup> However, the security of the lodgment was not complete until the next morning when the 2d Brigade was given the mission to move to contact to seize the high ground, and attack to seize Calliste Barracks.<sup>43</sup>

As the operation began, it became apparent that the need for massed fires lay in the vicinity of Calliste barracks itself. The Bravo Company Commander of the assaulting battalion had been killed during the initial reconnaissance of the routes forward. Calliste Barracks

would not be taken down without a fight.<sup>44</sup>

The 2d Brigade began the operation with two battalions in the lead supported by the brigade's habitually associated artillery. The artillery support did not consist of the entire battalion's complement of tubes, which was caused by airlift constraints getting the guns to the island and not to a flaw in the artillery command and control structure. What tubes were present, were organized to support the 2d Brigade.<sup>45</sup>

This focusing of fire support requirements was handled easily by the artillery command and control structure. Fire plans were in place and executed without confusion. The result was again a successful operation as the lodgment was expanded and secured.<sup>46</sup>

The artillery command and control relationship remained relatively constant throughout the Grenada operation. The artillery also retained enough flexibility to permit plans for massing fires later in the operation. This was not the case for some of the other combat support elements beside the artillery.<sup>47</sup> The experience of the military police (MP) platoon operating in support of the 2d Brigade, serves as an example for what can happen to combat support assets which routinely operate on a "mission basis".

The 2d Brigade integrated its slice of supporting MPs fully into its operations, beginning with security of

the brigade command post and prisoner of war collection. Given the relatively low density of MPs in the brigade, their proportional contribution to the overall effort was high. This state of affairs was satisfactory for the initial portion of the Grenada operation. However, by the third day of the operation, this changed. The division provost marshal command began to pressure the brigade to consolidate the MP assets back under division control to facilitate division operations. There was a perceived need to facilitate division operations by centralizing the control of MP assets. This consolidation was done with the result that the division function was served by stripping the brigade of its needed assets.<sup>48</sup>

While it may not be immediately apparent what this MP experience has to do with close support artillery, it does have relevance in highlighting the danger of implementing a C<sup>2</sup> structure that is "too" flexible. Radical changes in the middle of offensive operations cast doubt on the wisdom of having too much flexibility!

As with Operation Chromite, this review of the Grenada operation spotlights several key C<sup>2</sup> issues that are relevant to ALBF forces. The first of these issues is the threat of confusion if the Army implements a command and control structure different from the current doctrinal structure.

Second, training at home station is an important

tool for both maintaining competence in technical artillery matters and for establishing and streamlining the command and control relationships necessary for a smooth operation. This training is linked with the establishment of doctrine. They must be done in concert.

Third, the benefits of close command and control relationships extend beyond easier fire planning and execution. The benefits include the ability to execute quicker deployments and transition to initial operations. The rapid deployment to Grenada is a perfect example of the results that can be achieved if the C<sup>2</sup> is tight.

Finally, command and control relationships need to have an aspect of permanence throughout an operation without losing flexibility. Stripping assets away from a brigade while it is in the middle of an operation hinders building trust and full integration in future operations.

The concepts and background detailed in this second part of the paper lay the groundwork for further, detailed analysis in Part III. The analysis will build on the force structure and missions that have been introduced and the vignettes which introduced key C<sup>2</sup> issues. Finally, the analysis will follow the basic roadmap already laid out that includes the application of agility criteria and the cybernetic attributes from the Wass de Czege Combat Power Model.

### III. QUANTIFYING THE UNQUANTIFIABLE

*The role of uncertainty in determining the structure of command should be...decisive.*<sup>49</sup>  
Van Creveld

The concepts and background from Part II establish a firm base for discussion of command and control issues. The historical vignettes are relevant and current. What is missing is a framework that allows the comparison of command and control options that goes beyond general issues. The Wass de Czege Combat Power Model will establish this framework. The comparison will be made and the agility criteria can be applied. The result is a set of C<sup>2</sup> options that provide some measure of assurance to the future CAMB commander that his force agility will be facilitated.

The attempt to accurately quantify combat power has bedeviled operations and research modelers for years. The major hurdle is the question of accurately replicating the synergistic effects of the command and control system. One model which seems to come very close to viability in this area is the Combat Power Model developed by Brigadier General Huba Wass De Czege.

The introduction that BG Wass De Czege wrote for this combat power model includes a warning against taking his analytical framework in too much of a prescriptive vein. "This model provides a guide to "how to think", and not necessarily "what to think"..."<sup>50</sup>

This warning is especially important when dealing with what are normally considered to be issues and items that seem to be too amorphous to quantify. The contribution that this model makes to the process is in providing a good effort at identifying the inter-relating components and descriptors of the cybernetic process. These cybernetic components and descriptors are divided among four basic divisions within the model, maneuver, firepower, protection, and leadership.<sup>51</sup>

These four divisions incorporate numerous subcomponents and descriptors which lay outside the bounds of this study. However, there is a discrete group of attributes among the list of components of combat power which are of interest. These attributes relate the descriptors of a successful cybernetic structure to the criteria which describe the AirLand Battle tenet of agility. This group includes, *span of control, SOPs and doctrines, staff efficiency, communications efficiency, technical proficiency of leadership, and leadership understanding of unit capabilities*. Because the relationships between these attributes and the tenet of agility may seem to be tenuous at first, a brief definition and description of each is included for clarity:

*Span of Control* - defined in terms of all items requiring the commander's attention during a critical

moment. A span judged as "too big" results in command and control gridlock and slowed action.<sup>52</sup> For the application within the model, ask if the span of control associated with the option has a positive effect, no effect, or a negative effect on the agility criteria.

*SOPs and Doctrines* - defined in terms of a unit's tactics, techniques and procedures. It is an aid to control by facilitating communications and coordination of desired actions. These items can not be "too complete".<sup>53</sup> For use in conjunction with agility, determine what effects a change in C<sup>2</sup> SOP and doctrine has on a unit's agility.

*Staff Efficiency* - defined in terms of facilitating the decision process by providing the right amount of the right information to the right commanders. Too much information is as bad as not enough or not the right mix of information. In either case, agility suffers.<sup>54</sup>

*Communications Efficiency* - defined in terms of the rapid flow of information and directions. This is fundamental across all criteria relating to agility.<sup>55</sup>

*Technical Proficiency of Leadership* - defined in terms of understanding the doctrines and procedures applicable to his/her unit and having the ability to use them. To apply to the agility criteria, ask how technical expertise is fostered or hindered by the C<sup>2</sup> option.<sup>56</sup>

*Leadership Understanding of Unit Capabilities* -

defined in terms of maximizing combat power by maximizing all variables and assets available to the unit at any particular point in time. Very closely linked to span of control issues as well as technical proficiency. It is applied to agility in a like manner.<sup>57</sup>

These combat power model attributes are an excellent vehicle for trying to come to grips with a satisfactory means of quantifying a system and process that is filled with unquantifiables. Unfortunately, attempting to attain truth through absolute numbers is an exercise in frustration. Failing to try at all leaves the analyst no further along than discussing historically generated issues. This paper will try to get at least "half way" by comparing the C<sup>2</sup> options and their impact on the attributes and agility criteria. The "answer" will come out as a number. That number will have meaning as a comparison against the "numbers" of the other options. It will provide a comparison based on something more structured than just historical vignettes. A search for anything beyond this should draw the warning from Martin Van Creveld: *...the ideal command system, like Plato's Republic, exists only in heaven.*<sup>58</sup> Like Plato's Republic, the command system cannot be fully quantified.

The analysis of this paper does measure the combat power model attributes within each of the three command and control options and quantifies their contributions

across each of the criterion for agility. The purpose is to determine the option with the best overall Agility Rating.<sup>59</sup>

The details of the analysis are tabulated by mission in Figures 4, 5 and 6. Each table shows a numerical score of plus one (+1) assigned to an attribute which positively affects one of the criterion of agility. If an attribute is not related to a criterion, the entry is a zero (0). If the attribute does not affect a criterion one way or the other, it also gets a zero (0). If the attribute negatively affects a criterion, it is assigned a minus one (-1). The values for each table are totaled to arrive at the mission "Agility Rating". The Agility Rating for DS is 9. The Agility Rating for the organic option is 8. The Agility Rating for DS(+) is 12. Therefore, the DS(+) mission contributes more to CAMB agility than does either the organic or DS mission.

Even though there are numbers involved, this rating does retain a subjective component. The rating is based on a best available list of attributes. The analysis ratings also draw from the Operation Chromite and Urgent Fury experiences. Overall, it is compiled within the spirit of BG Wass de Czege's intent which is to provide a framework for "how to think".<sup>60</sup>

The first table at Figure 4 below shows the results of the analysis of the baseline DS option. There are two

areas that received significant decrements. The first area is staff efficiency. With an artillery batt. ior in DS, there are three staffs that must coordinate and synchronize actions. The brigade, the DIVARTY, and the artillery battalion all must work together.

MISSION	ATTRIBUTES	CRITERIA FOR AGILITY			
		Act Quick	Shift Main Effort	Change Msn	Maximize Training
DS	Span of Control	1	1	1	1
	SOPs & Doctrine	1	1	1	1
	Staff Efficient	-1	-1	0	-1
	Commo Efficient	1	1	1	1
	Ldrship Technic Profic'nt	1	1	1	1
	Ldrship Knows Cap'bil	-1	-1	-1	-1
TOTAL:				9	

FIGURE 4

The second weak area is knowledge of capabilities by the leadership. Artillerymen have more difficulty learning the maneuver capabilities and the maneuver leaders have the same problems with artillery capabilities when the headquarters are not closely linked. This is simply because the contact between the

two organizations is reduced if the link is not close.

The C<sup>2</sup> option which received the best overall score for agility is *Direct Support (Plus)* and is at Figure 5.

MISSION	ATTRIBUTES	CRITERIA FOR AGILITY			
		Act Quick	Shift Main Effort	Change Msn	Maximize Training
DS (PLUS)	Span of Control	1	1	1	1
	SOPs & Doctrine	-1	-1	-1	-1
	Staff Efficient	1	1	1	1
	Commo Efficient	0	0	0	0
	Ldrship Technic Profic'nt	1	1	1	1
	Ldrship Knows Cap'bil	1	1	1	1
<b>TOTAL:</b>					<b>12</b>

FIGURE 5

The *DS(+)* option received the top score for two major reasons. First, the option received high scores in the categories of technological proficiency of leadership and leader understanding of unit capabilities. This option provides the best mix of fixing responsibility for maneuver commanders and staffs to learn the intricacies of field artillery while still retaining the positive technical proficiency that comes with the overwatch of

the division artillery.

Second, the DS(+) option received negative ratings for only SOPs and Doctrine. This reflects the potential for confusion that was evident in the Grenada vignette. The soldiers of the 82d Division avoided initial confusion because of their strong pre-battle training. Not every unit has this strong of a program, and they will suffer the resulting confusion. The confusion will likely not last long though. The changes are relatively simple and straight forward. The opportunities for peacetime training are enhanced. In all likelihood these negatives should turn from negatives to positives fairly quickly.

The relatively low score of the *organic* command and control option, shown at Figure 6, is somewhat of a surprise. While it suffered the low scores in SOPs and Doctrine like *direct support (plus)* did, the option did score well in the areas of staff and communications efficiencies. Where this option was clearly deficient was in the attributes of span of control, and technical proficiency. Adding an artillery battalion to an already complex brigade will detract from the agility of the overall force. The commander's attention capabilities will be stretched to his limits on a routine basis.

MISSION	ATTRIBUTES	CRITERIA FOR AGILITY			
		Act Quick	Shift Main Effort	Change Msn	Maximize Training
O R G A N I C	Span of Control	-1	0	0	-1
	SOPs & Doctrine	0	0	0	0
	Staff Efficient	1	1	1	1
	Commo Efficient	1	1	1	1
	Ldrship Technic Profic'nt	0	0	0	-1
	Ldrship Knows Cap'bil	1	1	0	1
TOTAL:					8

FIGURE 6

The technical proficiency of the leader score is decremented based on lessons from the Army's past. Experience has shown that technical skills tend to deteriorate when units become organic to headquarters that do not have a resident pool of expertise responsible for standards of pre-battle training. Two examples of this are resident in the Army's recent history. First, the introduction of Redeye sections as organic to maneuver and artillery units failed because of the units' inability to conduct effective low density training.<sup>61</sup> The second example is the attaching of artillery

battalions to maneuver units to conduct riverine operations during Vietnam. This also failed within a year as the technical skills of the artillerymen began to deteriorate. In both cases the loss in technical skills occurred in the short term and was significant.<sup>62</sup> While there is no guarantee that this deterioration will always occur, the risk is simply not worth the potential gain.

#### IV. CONCLUSIONS AND IMPLICATIONS

*... Historical advances in command have often resulted less from any technological superiority that one side had over the other than from the ability to recognize those limitations and to discover ways - improvements in training, doctrine, and organization - of going around them.<sup>63</sup>*

*Van Creveld*

The requirements and demands on the Army doctrine, organization, training, materiel, and leaders are ever changing. A continuing effort to evaluate current capabilities for adequacy is required. Where adjustments are appropriate, they should be made without delay and without unnecessary regard for "the way it has always been done". Timely corrections to improve capabilities preclude the need for drastic and more risky major revisions in a rapidly changing world.

The present doctrine for assigning close support field artillery battalions to division artilleries and then giving them missions in direct support of maneuver brigades is probably due for an "adequacy check" with respect to agility. The change in doctrine to ALBF introduces an increased emphasis on the transition from strategic movement to tactical operations. This transition will certainly stress C<sup>2</sup> structures to their fullest. Increased agility offers the solution to this stress. The ability of a unit to *act fast, shift the main effort without delay, change missions, and maximize its*

*training opportunities* will become hallmarks of success. The challenge is to identify and detail the paths to this improved agility in doctrine for implementation before they are needed on the battlefield.

The conservative approach to decision making on matters concerning doctrine says that things are adequate until proven otherwise. It is true that the current doctrine provides for close support to the maneuver brigades. The doctrine also provides for the flexibility in massing fires that past battles show as important. Therefore, the first conclusion of this paper is that the *direct support* option is adequate for current missions. The results of the analysis support this, as do the historical vignettes.

The second conclusion is closely related to the first. The *organic* option is not as good an option as is *direct support*. Furthermore, the *organic* option is probably inadequate for current missions based on the historical vignettes and analysis. The problems that this option has with maintaining technical proficiency cast significant doubt on its utility in all but the most special situations.

The third conclusion is that the *direct support (plus)* option is viable and adequate for current operations. Based on the historical vignettes and analysis, it is also superior to the other C<sup>2</sup> options

given the key criteria of agility. Additionally, *DS (plus)* is flexible enough to have utility in most organizations and will probably enhance agility there, also. However, the restructuring of command and control doctrine does raise significant implications and concerns.

There are two related questions that must be answered before proceeding headlong into restructuring. How much longer will the current *direct support* doctrine remain adequate? And, when is the best time to modernize the doctrine to keep up with the incremental changes of a changing world?

Guessing the date that the doctrine becomes inadequate is fruitless. However, given the rapid pace of change in the world, that time will be perhaps sooner than later. The need for improving agility continues to grow as the Army begins to place greater emphasis on lodgment operations. By incremental adjustments of the doctrine, the Army stands a better chance of not being caught "too far wrong" at the time the doctrine is put to the test.<sup>64</sup> This is especially true if the proposed change in doctrine results in both improved agility as well as a bridge between generations of major capability changes. Therefore, the best time to update the doctrine is probably as soon as it is determined that the change will have a positive effect on combat power through

increased agility in both the current and foreseeable organizations. This keeps the Army from having to wrench itself through major changes by evolving from improvement to improvement.

In the specific case of the field artillery battalions of today and the combined arms maneuver brigades envisioned for tomorrow, the time to consider updating doctrine is now. The leading candidate to replace the doctrine of direct support is the new *direct support (plus)*.

The relationships that come with the *direct support (plus)* option improve agility. Close support fires of current organizations can reflect this increase in agility without showing a loss in flexibility. Perhaps best of all, the cost for making the change is measured in terms of initial SOP and doctrine adjustments. This bill is easily paid with the increased opportunities for pre-battle training.

The other implications stemming from upgrading the doctrine rest in the areas of leadership, and training. Commanders at each echelon from artillery battalion to division must become familiar with the changed procedures. Their staffs will require training to adjust to the new planning policies that will help implement the change.

While there will be some initial inefficiencies

associated with updating training and SOPs, the positive results from increased agility should be greater. *Direct Support (Plus)* should accent the strengths from both the old *DS* and the *organic* options. One thing is certain. A CAMB commander will know where his artillery is, and how much capability it has left. He will also receive the full benefit of the fires.

How should the command and control of close support field artillery assets be structured to support a combined arms maneuver brigade which is conducting the mission to expand the lodgment? Assign to a division artillery and assign a mission called *Direct Support (Plus)*.

## ENDNOTES

1. US Army Command and General Staff College, FM 100-5, Operations, 1986: 22.
2. US Army Combined Arms Combat Development Activity, AirLand Battle Future Umbrella Concept (ALBF) (Draft), 1 June 1990: 1-8.
3. Ibid., 1-12.
4. Ibid., 30,32.
5. Martin Van Creveld, Command In War, 1985: 191.
6. FM 100-5: 16.
7. Van Creveld: 190.
8. ALBF: 16-21.
9. Ibid., 20-21.
10. Ibid., 17.
11. Ibid., 19.
12. Ibid., 1-32.
13. Army Development and Employment Agency (ADEA), Operational Concept For An Infantry Division (Motorized), 1985: 1-5. The 199th SMB force structure is a direct result of this study. The original study became manifested in the force structure of the 9th Infantry Division (Motorized). The division was designed to maximize strategic deployability while maintaining tactical mobility and firepower. This motorized concept, as a division, became a casualty of the force structure cut decisions of 1989, and re-emerged as a brigade-sized organization. The unit resides at fort Lewis, Washington and is composed of many of the personnel and equipment of the 3d Brigade, 9th Infantry Division. It is a unit designed to be capable of independent operations while retaining the capability to operate within a divisional organization.
14. ALBF: 17.

15. The Armed Forces Staff College has designed this issue into one of its major joint exercises. The entire problem of structuring the transition from strategic movement to lodgment and then from lodgment to expanding the lodgment is a difficult one which has not yet been fully resolved. As such, this problem has become integral to the entire exercise. What is fairly certain is that the expand the lodgment mission will have to take place and be done early on.

16. ADEA, 4.

17. FM 100-5: 16.

18. Ibid., 16.

19. Ibid., 16.

20. The results of numerous brigade rotations to the NTC clearly indicated that the time period beginning at "change of mission" is critical to success and can be trained. Units routinely show significant improvement in this area as they progress through their rotations.

21. An example of this phenomenon is the training success that comes with attaching fire support personnel to their supported maneuver units during training exercises as opposed to utilizing the more traditional "habitually associated" relationship. Responsibility and accountability seem to be more clearly understood and the training benefits accordingly.

22. Brigadier General Huba Wass De Czege, Understanding And Developing Combat Power, 1984: 30-31, 42-44.

23. US Army Field Artillery School, FM 6-20, Fire Support in the AirLand Battle, 1988: 2-9.

24. Ibid., 20.

25. Ibid., 20.

26. Ibid., There is a problem with discussing a command relationship, which organic is, at the same time that assigned missions such as direct support are being discussed. The inherent responsibilities for the DS mission are quite well specified. The same specificity for the organic relationship is not there. Therefore, this is my best interpretation of the doctrine. This interpretation has been concurred with by Major Robert F. Guenther, the Chief, Warfighting Branch, Fire Support and Combined Arms Operations Department, US Army Field

Artillery School during a telephone interview conducted on 20 November, 1990.

27. US Army Field Artillery School, Division Artillery Operational And Organizational Plan, not dated: 1. This O&O Plan is the only hard copy document which lists the definitions of Direct Support (Plus). The table in the text is my representation of this information. It is consistent with an interview conducted on 14 November, 1990, with Mr. William Rittenhouse, Chief of Systems Priority Integration Division, Concepts and Technical Branch, US Army Field Artillery school.

28. Ibid., William Rittenhouse, Interview, 1990.

29. DIVARTY O&O Plan: 1.

30. Van Creveld: 194.

31. X Corps (US). War Diary Summary, X Corps, 15 August 1950 - 30 November 1950, 1950.

32. US Army Combat Studies Institute, CSI Battlebook 2-D, Operation Chromite (Inchon), 1984: 59-77.

33. Lynn Montross and Nicholas Canzona, U.S. Marine Operations in Korea, 1950-1953, Volume II, The Inchon - Seoul Operation, 1955: 153-185.

34. Ibid., 335-340.

35. CSI Battle Analysis: 83-84.

36. Van Creveld: 226-227.

37. August Fucci, Interview, 1990.

38. This information was distilled from reading numerous classified afteraction reports and interviews. These interviews included the DIVARTY Commander, Colonel Fred N. Halley, the brigade commanders and the brigade fire support officers.

39. Fucci, Interview.

40. Charles Jacoby, Interview, 1990.

41. Fucci, Interview.

42. Adkin, 225.

43. Jacoby, Fucci confirmed this issue in separate interviews.
44. Daniel Bolger, Americans at War, 1988: 330-332.
45. Fucci, Interview.
46. Fucci, Interview.
47. Fucci, Interview.
48. Ibid.
49. Van Creveld, 268.
50. Wass de Czege, 1.
51. Ibid., 8-10.
52. Ibid., 25.
53. Ibid., 25.
54. Ibid., 25
55. Ibid., 32.
56. Ibid., 31.
57. Ibid., 31.
58. Van Creveld: 262.
59. Morris Hamburg, Statistical Analysis for Decision Making, 1983: 567-596.
60. Wass de Czege: 1.
61. Excerpt from an interview with Colonel James Moody, ADA. The conversation included discussions on the failure of Redeye sections to be integrated into maneuver battalion training and operations. The result was a failure, and Redeye have been reconsolidated into ADA battalions.
62. Lieutenant General Johnnie H. Corns, Discussions, conducted at Fort Leavenworth in June 1985.
63. Van Creveld: 275.
64. Michael Howard, Quotation displayed in Seminar 2 room.

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