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**The Electronic Pivot of Maneuver:
The Military Intelligence Battalion
(Combat Electronic Warfare Intelligence)
[MI BN (CEWI)]**

A Monograph
by
Major Patrick Kelly III
Military Intelligence



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**School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas**

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Intelligence) [MI BN (CEWI)]

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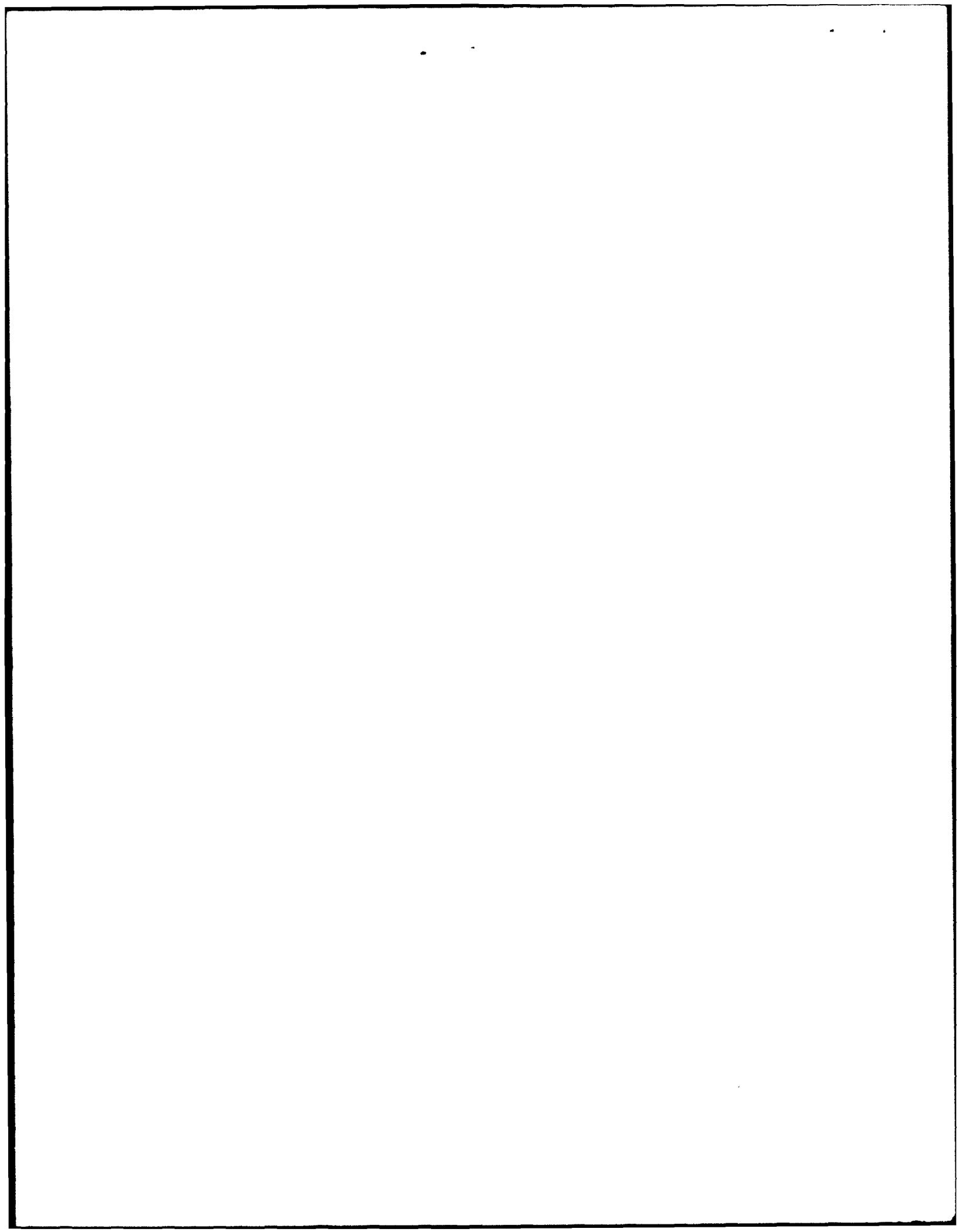
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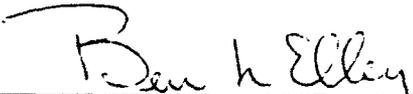
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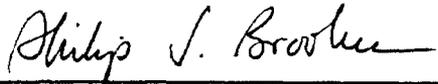
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ABSTRACT

THE ELECTRONIC PIVOT OF MANEUVER: The Military Intelligence Battalion (Combat Electronic Warfare Intelligence) [MI BN (CEWI)] by MAJ Patrick Kelly III, USA, 56 pages.

This monograph examines the question can the military intelligence battalion (Combat Electronic Warfare Intelligence) [MI BN (CEWI)] maneuver on the modern battlefield and function as a viable combat multiplier. The evolution of the US Army doctrine from active defense to AirLand Battle paralleled the birth of CEWI. CEWI organization, equipment, and doctrine reacted to the army doctrine by slowly adjusting from a baseline defense mentality to the realities of maneuver warfare.

The monograph examines the classical theoretical origins of maneuver and the doctrinal evolution from active defense to AirLand Battle. Next the evolution of military intelligence maneuver doctrine is examined. Artillery maneuver doctrine is examined as a foil for how another branch incorporates maneuver. Having explored the theoretical and doctrinal origins of military intelligence maneuver doctrine, the doctrine is compared against the Desert Storm tactics, techniques, and procedures of heavy division MI BNs (CEWI) to evaluate actual operations against the doctrinal standard.

The monograph concludes a thorough understanding of AirLand Battle doctrine, with assistance from intelligence doctrine, guided maneuver training in Desert Storm. Aggressive maneuver training assured MI BNs (CEWI) effective maneuver. Absent an electronic opponent, successful maneuver proved MI BNs (CEWI) a viable combat multiplier. Finally, successful maneuver is pivotal to future intelligence and electronic warfare operations.

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INTRODUCTION

The evolution of the military intelligence battalion [Combat Electronic Warfare Intelligence (CEWI)] paralleled the modern doctrinal debate centered around FM 100-5, Operations. As the army wrestled with the transition from active defense through AirLand Battle, military intelligence battalion organizations and doctrine also evolved. The concept of maneuver was central to both army doctrinal and intelligence electronic warfare evolution. Efficient maneuver is essential for the military intelligence battalion to function as a viable combat multiplier.

Although electronic warfare is perceived as a recent component of the modern battlefield, the interception, direction finding, and jamming capabilities of an army heavy division are a logical extension of the same capabilities which predate the World War I battlefield.¹ The integration of intelligence and electronic warfare (IEW) assets with the remainder of the army is new. Previously the veil of secrecy guarded the presence and employment of intelligence and electronic warfare assets. The creation of the CEWI concept in the 1970's removed the veil and introduced requirements for both the army and the intelligence service to understand each other.

One critical requirement is the ability of

intelligence electronic warfare systems and teams to maneuver on the modern battlefield. However, the concept of maneuver must be understood in a much broader concept than the dictionary definition of "planned and regulated movement of troops."² The concept of maneuver must be examined in its broadest military definition as an element of combat power, a style of warfare, and the codification of a variety of concepts mobility, movement, survivability, and synchronization.

An understanding of military intelligence maneuver starts with classical theories. This monograph will examine the evolution of both army and intelligence and electronic warfare doctrine by providing military intelligence maneuver an observable context. Next intelligence and electronic warfare maneuver is compared to an artillery foil.

Having established the theoretical and doctrinal foundations of intelligence and electronic warfare operations, the monograph will examine the tactics, techniques, and procedures (TTP) of current CEWI units. The examination will be based on an appraisal of heavy division military intelligence battalions' (CEWI) maneuver during Desert Storm which provides an opportunity to evaluate actual operations against the doctrinal standard. Finally, maneuver implications for future CEWI units will be explored as military

intelligence moves to the next generation of equipment and organizations.

CLASSICAL THEORIES OF MANEUVER

Any discussion of maneuver on the modern battlefield begins with an examination of the classical theories of maneuver. The ideas of Sun Tzu, Clausewitz, Jomini, and Liddell Hart have impacted current U.S. maneuver doctrine. Immediately obvious is the fact that each theorist articulated differently the significance of maneuver to warfare.

Sun Tzu introduces the concept of maneuver in an entitled chapter. The inherent complexity of a maneuver definition is highlighted by a footnote clarifying the literal definition as "'struggle' or 'contest of the armies' as each strives to gain an advantageous position."³ In his aphoristic style, Sun Tzu warns, "Nothing is more difficult than the art of maneuver."⁴ The essence of Sun Tzu is contained in his discussion on the interrelationship of cheng (normal or 'direct') and ch'i (extraordinary or 'indirect'). "He who knows the art of the direct and the indirect approach will be victorious. Such is the art of maneuvering."⁵ Sun Tzu also reminds the reader that "both advantage and danger are inherent in maneuver."⁶ Mixed with Sun Tzu's duality

of warfare is an understanding that maneuver is the art of employing troops which allows the general to move to an advantageous position.

Clausewitz also provides the reader a chapter entitled Maneuver.⁷ However, Clausewitz is far less enamored with maneuver. Clausewitz previously disparages strategic maneuver as a characteristic of pre-Napoleonic warfare, "...This game (the whole art of maneuver) was rated the highest form of skill (among great commanders)...This is a view so lacking in logic and insight that it must be considered a hopeless confusion of values."⁸

Clausewitz defines maneuver as "a play of balanced forces whose aim is to bring about favorable conditions for success and then use them to gain an advantage over the enemy."⁹ Clausewitz's discussion focuses on the juxtaposition of two pairs of opposites --outflanking or operating on interior lines and concentration or dispersal over numerous posts. Disenchanted with the whole concept, Clausewitz concludes:

We are therefore certain that no rules of any kind exist for maneuver, and no method or general principle can determine the value of the action; rather, superior application, precision, order, discipline, and fear will find the means to achieve palpable advantage in the most singular and minute circumstances.¹⁰

Clausewitz does embrace concepts included in a modern definition of maneuver. Clausewitz introduces the

concept of relative superiority to describe the skillful concentration of superior strength at the decisive point.¹¹ In summary, Clausewitz viewed maneuver as a component of warfare, not an end unto itself. This theme reappears during the modern debate.

Antoine Henri Jomini reincarnated the prescriptive "old school" who glorified the art of maneuver warfare. His understanding of maneuver is different from Clausewitz. He stressed the unity of fractions in the execution of the decisive maneuver to accomplish victory.¹² Jomini details the various formations available which a skillful commander may use. Maneuver's purpose is to overwhelm a wing or dislodge the enemy by outflanking or turning an opponent's position.¹³ The result of successful maneuver is the turning of the enemy's position. This turning maneuver is a pre-condition for routing the enemy's army through battle or successive inconsiderable affairs, which will place the enemy army at even greater disadvantage.¹⁴ Jomini concludes as a firm believer in maneuver, especially when applied at the decisive point of battle. Jomini introduced the concept of fire and maneuver which will also dominate the modern debate.¹⁵

After an exhaustive historical discourse, B. H. Liddell Hart codified the concept of the indirect approach. Without a direct definition, Liddell Hart

implies that there are two essential components to maneuver (the strategy of indirect approach): mobility and surprise.

Strategy's purpose is to diminish the possibility of resistance, and it seeks to fulfil this purpose by exploiting the elements of movement and surprise...the two elements react on each other. Movement generates surprise, and surprise gives impetus to movement.¹⁶

The decisive battle as articulated by Clausewitz and Jomini is still possible, but less likely due to the mobility of the indirect approach. In the future, the prospects for achieving decisive action are more likely using movement than fighting.¹⁷

Although not defining maneuver, Liddell Hart captured the dynamic nature of maneuver in his discussion of the indirect approach and the role of mobility and surprise. Returning to ideas introduced centuries earlier by Sun Tzu, the definition quest appears to have gone in a circle. However, many of the concepts which appear highlight the modern definition and debate.

U.S. ARMY MANEUVER DOCTRINE

The 1976 version of FM 100-5 initiated the modern doctrinal debate over the role of maneuver. Previously, maneuver had been defined in its capacity as a principle of war. "Maneuver is the positioning of forces to place the enemy at a relative disadvantage."¹⁸ Maneuver was

also listed as one of the three principle tasks of offensive action. Combat power was defined as consisting chiefly of firepower combined with maneuver.¹⁹

The 1976 version of FM 100-5 is closely associated with its chief architect, General William DePuy. The general and his manual have been credited with revitalizing the post-Vietnam Army and focussing the Army on the lethalties of modern warfare and the anticipated conflict in Europe. The doctrine itself came under intense critique, especially its emphasis on firepower at the expense of maneuver.²⁰

The concept of maneuver pervades the 1976 manual, as colonels were expected to "maneuver combat service support resources."²¹ However, the 1976 edition did not provide a clear-cut definition of maneuver stating, "coordination of suppression with the maneuver of forces is the essence of success."²² In the absence of a clear definition, the concepts of mobility, movement, and maneuver became confused.²³

In the debate over preeminence between firepower and maneuver, the 1976 edition of FM 100-5 clearly favored firepower. The advantages of the defense played a prominent role in the doctrine which became known as the active defense.²⁴ One of the least debated features of the 1976 manual was the elevation of intelligence and electronic warfare to a form of combat power.²⁵

The role of maneuver in modern warfare was one of the most hotly debated issues raised by FM 100-5. The new doctrine attempted to produce a "tailored maneuver doctrine" cognizant of the realities of budget constraints, weapon lethality, and strategic reality.²⁶ The critics of FM 100-5 viewed the document as too defensively and firepower oriented. However, one early critic, Mr. William Lind, would prove instrumental in introducing maneuver warfare to the Marine Corps.

Just as Liddell Hart developed his strategy of the indirect approach based on historical analysis, Mr. Lind also developed a detailed theory based on his reflections on maneuver warfare. His maneuver warfare theory is based on the time-competitive, observation-orientation-decision-action loop or the Boyd Cycle.²⁷ Maneuver warfare was described as a continuous process to render the enemy's actions irrelevant. Mobility, a component of maneuver, becomes maneuver when it inflicts command paralysis on the enemy.²⁸ The inability of FM 100-5 to distinguish between maneuver, mobility, and movement drew criticism.

The critiques of FM 100-5 were not limited to external pundits. Factions within the Army also proclaimed dissatisfaction with the active defense focus, the emphasis on firepower-attrition models, and the lack of worldwide applicability. A new edition of FM 100-5

would provide the solution.²⁹

Although the debate carried on for years, a solution was found in the AirLand Battle doctrine of the 1982 edition of FM 100-5. The revised manual reintroduced maneuver as a principle of war and provided the following definition. "Maneuver places the enemy in a position of disadvantage through the flexible application of combat power."³⁰ Included in this principle of war are the concepts of flexibility, mobility, and maneuverability. Maneuver was also listed, along with protection, firepower, and leadership, as an element of combat power.

Maneuver is the dynamic element of combat...More specifically, it is the employment of forces through movement supported by fire to achieve a position of advantage from which to destroy or to threaten destruction of the enemy.³¹

Maneuver was further highlighted in the discussion of the second and fifth combat imperatives. Maneuver combines with surprise to create the imperative -- direct friendly strengths against enemy weakness. This imperative echoes Liddell Hart's earlier strategy of the indirect approach based on movement and surprise. Maneuver also combines with mass to create the imperative -- move fast, strike hard, and finish rapidly. This imperative conjures up Clausewitz's concept of relative superiority at the decisive point. Finally, the 1982 edition of the manual discusses forms of maneuver in a chapter on offense.

A 1985 article in Military Review forewarned that the 1986 edition of FM 100-5 "will update and refine the AirLand Battle. It will be a second edition of current doctrine rather than a revision."³² This was certainly the case regarding maneuver. Maneuver's significance as a principle of war and an element of combat power did not change. However, a newer definition appeared, "Maneuver is the movement of forces in relation to the enemy to secure or retain positional advantage."³³ Although the number of imperatives increased, their discussion relative to the principles of war diminished the understanding of maneuver. The manual's emphasis on the operational level of war created the requirement to define operational maneuver which "seeks a decisive impact on the conduct of a campaign."³⁴

The 1992 preliminary draft of the next edition of FM 100-5 also appears to be an evolutionary not revolutionary document when discussing maneuver. The phrase "potent combat forces" has been inserted to the combat power definition of maneuver. The principle of war definition has also been modified so that it echoes the combat power definition; yet, the principle of war definition omits the "potent combat" phrase.³⁵ The combat imperatives are gone so there is no discussion of maneuver within this context.

The comfort level of the US Army regarding the

concept of maneuver has vastly increased in the past ten years. Disciples of the maneuver warfare theory, as ascribed by Mr. Lind, continue to proselytize.³⁶ However, a balanced analysis can be found. "Maneuver is important, but only insofar as it seizes the initiative and maintains freedom of action. Maneuver is not an end in itself; neither is nonlinearity."³⁷ It remains to be seen if military intelligence learned the same lessons as the remainder of the Army.

The US Army does not have the final authority on the definition nor implementation of maneuver warfare. JCS Publication 1-02 defines maneuver as "Employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect to the enemy in order to accomplish the mission."³⁸

The Marine Corps version of maneuver warfare is articulated in FMFM-1, Warfighting. The two basic forms of combat fire and movement translate into the two basic styles of warfare: "an attrition style, based on firepower, and a maneuver style, based on movement."³⁹

Warfare by maneuver stems from a desire to circumvent a problem and attack it from a position of advantage rather than meet it straight on....By definition, maneuver relies on speed and surprise, for without either we cannot concentrate strength against weakness.⁴⁰

The varied military definitions of maneuver

highlight the difficulty in understanding it. A correct definition is like trying to describe the color green. Some focus on its primary color components, while others rely on physics, nature, or art to describe it. There are few incorrect definitions, yet none are complete. Each definition misses some essence in its attempt. Military intelligence doctrine interprets rather than defines maneuver warfare. It is now time to examine the military intelligence doctrinal interpretation.

MILITARY INTELLIGENCE MANEUVER DOCTRINE

The tumultuous era that saw the inspiration and implementation of the 1976 edition of FM 100-5 also created the current military intelligence organization. "The overriding theme of FM 100-5 is that the commander operates his battlefield and everything on it or above it. This is why CEWI cannot be performed at echelons beyond the battlefield."⁴¹ The recognition of electronic warfare as a new form of combat power elevated the military intelligence branch and exposed the archaic intelligence command and control arrangements.

The 1975 Intelligence Organization and Stationing Study (IOSS) evaluated the effects of electronic warfare from the 1973 Arab-Israeli War, an impending era of budget constraints, and the necessity to reorganize the

intelligence community. The result was the creation of the division and corps' military intelligence battalion [Combat Electronic Warfare Intelligence (CEWI)].

The relationship between the active defense and CEWI battalions was ideal. CEWI was born during an era of analytical modeling and scarce resources; therefore, research and development not tactics drove equipment design.⁴² Lacking a viable historical model and adequate resources to optimize the new organization exploiting the electromagnetic spectrum, a hybrid battalion evolved. Antiquated equipment, severe personnel shortages, and an absence of doctrine all greeted the new military intelligence battalion.

Prior to the CEWI concept, military intelligence organizations were scattered throughout the Army. The doctrine was likewise scattered and not codified. The 1973 edition of FM 30-5, Combat Intelligence, focussed on intelligence requirements of maneuver units. There is no mention of mobility or maneuver issues for intelligence units. The 1973 edition of FM 30-9, Military Intelligence Organizations, focusses on the tactical orientation of Field Army intelligence groups and battalions. Intelligence analysis, imagery interpretation, and counterintelligence assets belonged to this organization, yet once again the doctrine did not address mobility or maneuver issues.

The third component in the pre-CEWI triad was the US Army Security Agency (USASA). Five classified manuals did describe USASA's role, but none contained a specific chapter on mobility or maneuver. However, a phased plan for continuous coverage or displacement did exist.⁴³

The first doctrinal concepts which guide CEWI employment and doctrine are contained in the 1976 edition of FM 100-5. Electronic Warfare (EW) systems should be forward deployed and EW operations coordinated with fires and maneuver.⁴⁴ A new movement technique employed only by military intelligence was also coined. "In both offensive and defensive operations, commanders should 'leapfrog' or 'jump' their collection resources so that they have continuous coverage to meet their needs."⁴⁵

A series of prophetic statements about the requirements of EW are also included in the manual. First, vulnerability dictates ground based radio direction finding (DF) assets will form the nucleus of divisional electronic warfare. Second,

Jamming units must be able to perform electronic combat missions while deploying and when in contact with the enemy. Antennas must be able to be raised and lowered in seconds, not minutes. All equipment must be simple to operate and to maintain.

Third, survival on the modern battlefield requires,

Ground mobile EW elements must be mounted in armored vehicles that are compatible with and of equal mobility to the other elements of the combined arms team.

And finally,

The enemy's use of low power, high frequency (HF) and very high frequency (VHF) tactical communications may dictate the deployment of ground-based, HF Electronic Warfare assets in the division forward area. EW units must therefore accompany brigades and battalions, and be equipped and trained to deploy within sight of the line of contact.⁴⁶

Never again will the essence of military intelligence maneuver be articulated so clearly. Included in this doctrinal discussion are the principles of maneuver, speed, simplicity, mobility, survivability, risk, and synchronization. Nearly twenty years later, these simple doctrinal precepts could all be rewritten as CEWI lessons learned or recommendations for the future. They certainly capture the frustrations that CEWI units experienced as they transferred from the active defense to AirLand Battle.

During the late 1970's the military intelligence community survived initial growing pains and began to produce doctrinal "How-to-Fight" (HTF) manuals. Unfortunately, these documents were obsolete almost upon final printing since AirLand Battle was almost simultaneously superseding active defense.

The first doctrinal manual addressing divisional military intelligence was FM 34-10 (HTF), Military Intelligence Battalion (CEWI). There is no discussion of movement, mobility, nor maneuver in this how-to-fight manual. The essence of the defensive focus and static nature of CEWI operations is revealed.

Both collection and jamming equipment normally require line-of-sight to targets. Such equipment must be positioned on high ground with good concealment. It is also necessary to coordinate the location and measures for physical security with the supported brigade.⁴⁷

Even jammers, whose vulnerability the manual clearly recognized, will be protected through mission management -- not maneuver -- by shifting missions from jammer to jammer.⁴⁸

A companion manual, FM 34-12, Collection and Jamming Company, Military Intelligence Battalion (CEWI) (Div), published in September 1982, is the first military intelligence doctrinal manual which addresses maneuver -- albeit briefly. Maneuver strategies for both the movement to contact and the offense are suddenly added to the existing defensive baseline techniques. During the movement to contact,

One platoon sets up near LD [line of departure], ...the battalion operations center determines generally when and where the second platoon sets up operations. The first platoon then moves forward...This procedure is repeated to provide continuous support. When necessary, all three collection and jamming platoons may be used to support the advance guard or covering force.⁴⁹

Likewise during offensive operations, operating far forward, system effectiveness will decrease as battlefield tempo increases. Displacement will be necessary to continue operations.

Since displacement causes a temporary lessening of company support, an increased reliance on aerial resources is created until ground operations are once again at optimum levels.⁵⁰

It is important to remember that the 1982 collection and jamming company contained assets that are now scattered among the collection and jamming company, the electronic warfare company, and the headquarters company. In effect, this earlier company doctrinal concept now applies to the entire military intelligence battalion.

The ubiquitous "leapfrog" movement is the technique to accomplish military intelligence maneuver. "Place two collection and jamming platoons in direct support of the advance guard or covering force. The two platoons then leapfrog to maintain continuous support."⁵¹

While the military intelligence battalion wrestled with organization, activation, modernization, and integration the remainder of the army embraced the new AirLand Battle doctrine.⁵² The initial impact of AirLand Battle on military intelligence was the loss of EW as an autonomous form of combat power. EW remained a component of the battlefield environment and an "effective tool of battle in a combined arms context."⁵³

The requirements of AirLand Battle caught the emerging military intelligence battalion off guard. Focus on the brigade close-in battle and the forward line of troops (FLOT) battle resulted in doctrine and systems not prepared for the requirements of deep operations.⁵⁴

The military intelligence battalion was not organized and equipped to rapidly shift to the new

requirements of the changing doctrine.

The designers and proponents of CEWI failed to anticipate our doctrinal evolution. Viewed in light of our emergent AirLand Battle doctrine, much of our expenditure of energy and heavy investment in force structure and systems development has led to hollow victories. Military Intelligence -- most specifically the divisions' CEWI organizations -- continues to follow a path that diverges from the AirLand Battle effort.⁵⁵

Whereas some viewed the situation as yet another challenge to overcome, "internal solutions involve CEWI battalions balancing good maintenance with effective technical and practical tactical training to maximize operational capabilities."⁵⁶ Others were pessimistic:

A relative abundance of ground-based intelligence systems have been fielded. These systems are lethargically mobile, at best, and each demands precision placement and requires excessive setup and tear down times...Only one division-level system, QUICKFIX (emitter locator heliborne system), can currently rise to the rigorous demands of AirLand Battle offensive operations.⁵⁷

The publication of the 1986 edition of FM 100-5 found the military intelligence community much better prepared for the evolutionary shift of doctrine. A family of manuals (FM 34 series) published between 1981 and 1984 articulated the military intelligence role on the battlefield. Starting in 1986, these manuals were revised and updated. CEWI embraced the AirLand Battle concept; unfortunately, the doctrine continued to ignore maneuver concepts.

The keystone military intelligence document is FM 34-1, Intelligence and Electronic Warfare Operations.

While discussing organization for combat, the manual states the nine principles of war guide AirLand Battle. "In organizing for combat, four of the nine principles take precedence for consideration by MI commanders. They include: objective, economy of force, unity of command, and simplicity."⁵⁸ Conspicuously absent from this list are the principles of maneuver and offensive.

Even as military intelligence units donned the cloth of AirLand Battle, its parochial past precluded the mental maturation toward maneuver warfare. The 1986 edition of FM 34-80, Brigade and Battalion Intelligence and Electronic Warfare Operations, describes how military intelligence units operate on the battlefield. Only seven pages discuss offensive operations. Thirty-five pages are allocated to defensive operations.⁵⁹

The manual which discusses armored cavalry regiment operations probably provides the best guidance for military intelligence units operating on the modern fluid battlefield.

Because MI assets need more time to prepare to move than screening forces, they must have advance notice if they are to stay with the forces and still maintain battlefield coverage. Thus to properly support a screening force operation, MI assets must be mobile. MI assets must be able to move all of their equipment and systems quickly and efficiently with organic IEW equipment.⁶⁰

Recognizing maneuver is more than just movement or mobility, the manual describes the moving screen:

In a moving screen, MI assets must consider both

the speed of the main body and locations suitable for collection along the route. Aerial assets are substituted when ground assets cannot tear down, displace, set up, and resume operations and still keep pace with the main body.⁶¹

This articulation of the subelements of military intelligence maneuver is a dramatic improvement. Tactics, techniques, and procedures are still desperately needed to translate the complex requirements of maneuver warfare to IEW operations. If this is not accomplished then COL Nowak is correct in his assessment that IEW has been left in AirLand Battle's dust.

Today, the basic truth is that CEWI, as currently equipped and configured, is an amateur in a race with world-class athletes, such as our new M1 Abrams and M2/M3 Bradley family of fighting vehicles, and long-range shooters, epitomized by the MLRS (multiple launch rocket system).⁶²

AN ARTILLERY FOIL

Before examining the existing tactics, techniques, and procedures of military intelligence maneuver, a comparison with the shooters of the US Army will help clarify some of the doctrinal shortfalls. An examination of artillery doctrine is also appropriate because electronic warfare has been readmitted as an element of combat power. The 1992 Preliminary Draft of FM 100-5 clarifies electronic warfare as a form of non-lethal fires under the definition of firepower.⁶³

Artillery also wrestled with the transition from

active defense to AirLand Battle. In an extended sense artillery has transitioned from its heyday as the "King of Battle" during World War I to a component of the existing combined arms maneuver warfare. The most obvious difference between artillery and military intelligence doctrine is the recognition of the symbiotic relationship between fire support and maneuver.

Maneuver, as it pertains to the fire support system, is maneuver by fire. This implies the capability to transfer and distribute massed fires quickly from one point or area to another over a wide frontage and out to a great depth. It also implies the mobility to displace rapidly and to keep pace with the maneuver arms. The fire support system must maintain a sufficient degree of flexibility in altering missions, command relationships, and priorities of fire as battlefield conditions mature.⁶⁴

Electronic warfare doctrine would be well served through a similar articulation. Simply substituting intelligence and electronic warfare for fire support would go a long way towards clarification.

The next striking difference is the attention given to movement and positioning. An entire chapter of the tactics, techniques, and procedures manual develops ideas which military intelligence assumes or ignores. The designation of primary, alternate, and supplementary positions is a concept long overdue in intelligence electronic warfare operations. Survivability, long the bane of military intelligence, is specifically addressed in quite similar language. Reconnaissance and survey are

also addressed in terms appropriate to intelligence electronic warfare operations.

One significant doctrinal difference is the discussion of displacement. Whereas intelligence relies on the ill-defined leapfrog, artillery clearly articulates four types of displacement, "by unit, echelon, battery, or element (that is, by platoon, section, or vehicle)."⁶⁵ Although movement is highlighted, the artillery march techniques are probably not ideal. Close column, open column, and infiltration are only a partial solution. An extrapolation of the movement techniques used by air defense artillery (traveling, travelling overwatch, bounding overwatch, and dismounted with guidance to use the same movement technique as the supported unit), is more appropriate.⁶⁶

Another area of comparison is the balance between dispersion and concentration of effects. Dispersion is essential to survival from indirect fires and air attacks on the modern battlefield; however, the dispersion can not degrade the requirement to quickly mass fires. Automated systems like [tactical fires] TACFIRE allow a balance to be maintained between dispersion and concentration. A similar automated system linking jammers would allow electronic warfare to likewise strike a balance between dispersion and massing of effects.⁶⁷

The final doctrinal supposition applicable to

intelligence electronic warfare operations is the offensive mission consideration to "anticipate frequent moves and hip shoots."⁶⁸ The shoot on the move capability is a severe restriction to ground intelligence electronic warfare operations. Planning and training to optimize existing capabilities is necessary to address this shortfall.

Fire support operations provide an excellent foil to intelligence electronic warfare operations. An alternate interpretation and integration of maneuver doctrine reveals some shortfalls in military intelligence doctrine. The absence of adequate maneuver warfare doctrine does not negate the requirement to successfully maneuver on the battlefield.

DESERT STORM TACTICS, TECHNIQUES, AND PROCEDURES

Many claim Desert Storm as vindication of a decade of emphasis on AirLand Battle. Suspended in the debate is the role of divisional CEWI battalions. An examination of the tactics, techniques, and procedures of the ground based signals intelligence (SIGINT) assets during Desert Storm will contribute to the doctrinal debate. Recalling the charge as set forth in the 1976 edition of FM 100-5, the army received a failing grade in terms of equipment procurement. Issues of survivability,

mobility, speed, movement and integration with maneuver units were all points of contention fifteen years after the initial manual. Yet, the soldiers and leaders of the division CEWI battalion overcame these obstacles and were not left in AirLand Battle's dust.

The issue of survivability is the hardest to defend. The absence of a viable indirect artillery and air threat did not challenge the survivability of military intelligence assets. Collection and jamming teams are still mounted on thin-skinned wheeled vehicles despite the fact that they deploy forward near the forward edge of the battle area. The heavy assets are tracked but their systems are also in vulnerable shelters and the personnel equally at risk.⁶⁹ The lack of Iraqi indirect fires saved countless lives, but perpetuated the myth that existing military intelligence teams can survive on the modern battlefield.

A comparison of the helicopter borne and ground based AN/TLQ-17 jammer reveals the absence of emphasis on survivability. The ground based system is mounted on a commercial utility cargo vehicle (CUCV) or highly mobile and multiwheeled vehicle (HMMWV). The Kevlar shelter for the system provides minimal artillery protection. There is no organic positioning system. Finally, the vehicle cab and engine are not even protected against small arms fire. By contrast, recognizing the threat of air defense

weapons against helicopters, the AN/ALQ-151 QUICKFIX is equipped with a radar warning receiver, a general purpose chaff and flare dispenser, an infrared countermeasures set, a hover infrared suppressor system, three different countermeasure sets, and a laser warning device.

Although these systems are not unique to QUICKFIX, they do represent a concerted effort by the aviation community to provide helicopters battlefield survivability.⁷⁰

At first glance the question of mobility would also be difficult to defend based on the desert experience. The exact opposite is true. Both the wheeled and tracked vehicles proved themselves quite mobile in the desert environment. The absence of a modern Bradley family of intelligence vehicles highlights how successful military intelligence soldiers were at moving their older, less reliable assets. The flat contours of the desert assisted mobility, but it was the maintenance, training, and dedication of military intelligence battalion soldiers which kept military intelligence equipment moving while their maneuver brethren operated the newest generation of vehicles.

As long as a military intelligence vehicle is not the slowest vehicle on the battlefield, the assertion that mobility depends upon the entire force's ability to traverse a specified piece of terrain guarantees military intelligence mobility.⁷¹ Currently, a fully loaded

artillery howitzer towing an ammunition carrier is just slower than military intelligence assets. In the scheme of maneuver developed by VII Corps, this fact allowed military intelligence teams an acceptable degree of mobility. One exception to this rule was the generator trailers associated with the AN/TSQ-138 TRAILBLAZER system. The combination of tracked vehicles and wheeled trailers resulted in mobility problems for the trailers.⁷² The intention to modernize military intelligence systems on a Bradley chassis similar to the Electronic Fighting Vehicle System (EFVS) will only improve military intelligence mobility.

Speed is critical when examining emplacement and displacement techniques. Well-honed crew battle drills reduce setup and tear down times.⁷³ Every disciplined, battle trained team in the desert, dedicated to mission accomplishment, discussed how they would jury-rig, bypass, ignore, or invent solutions to the myriad of real and assumed problems. Most were overcome through rigorous mission oriented training.

Crew drills, battle drills, and actions on contact were all so well rehearsed that emplacement and displacement times were drastically reduced. AN/TLQ-17 TRAFFICJAM teams mastered the thirty second "hip shot jam" on the whip antenna while AN/TRQ-32 teams reduced their set up times from the doctrinal fifteen minutes to

under three minutes. The toil of trained military intelligence soldiers ensured mission success and provided the element of speed.⁷⁴

Without denigrating any particular unit's performance, the distinction between movement as a physical act of location or relocation and maneuver warfare as an attitude or state of mind, captures the different experiences of CEWI units in the desert.⁷⁵ The 533rd MI Bn (CEWI) was the last to arrive in theater with only a few weeks to acclimate, organize, and train. Their scheme of movement resembled a battalion road march in the division main body. At the other extreme was the 124th MI Bn (CEWI) with six months preparation. They balanced live collection requirements with many battalion and maneuver brigade exercises to attain the proverbial tactical and technical training proficiency. Some where in between was the 501st MI Bn (CEWI) and the 502nd MI Co (CEWI) with eight to ten weeks preparation. Their schemes of maneuver included task organization, integration with lead maneuver units, and a focussed maneuver training program.

The essence of these maneuver training programs is contained in an article LTG Richardson wrote ten years earlier to energize the armor community to the realities of the impending AirLand Battle.

We have not trained up to the level of our weapons systems, nor have we optimized the tactics and

techniques using those systems in our current organizations...Troop units have the responsibility of developing and maintaining a maneuver capability for the Army. This comes with constant practice -- taking the unit to the field frequently and practicing battle drills, innovative maneuvers, and command and control procedures.⁷⁶

Although written for an earlier generation of maneuver commanders, the message was assimilated by the military intelligence battalion commanders who recognized the requirement to maneuver their units to accomplish their assigned missions.

A good example of the inclusion of simplicity in military intelligence maneuver was the movement techniques employed by platoons and companies. Given the requirement to travel well forward in vanguard brigade formations, units trained on maneuver techniques long standardized in maneuver units. Wedge, diamond, echelon, and column formations were rehearsed until everyone mastered these fundamentals. Although trained and ready to travel in a wedge, the formation was changed to a column prior to crossing the LD. The primary reasons were the absence of artillery and air threat diminished the dispersal requirement and wheeled vehicles travelling in the armored vehicles tracks reduced the mine warfare threat. Additionally, adverse weather and night operations required the employment of the close column for effective command and control and well as movement.⁷⁷

Another example of simplicity was the use of the

Bravo Company (EW), 511th MI Bn (CEWI), Tactical Exploitation (TE), SIGINT assets by 2nd Armored Cavalry Regiment. These reinforcing corps SIGINT assets were organized as pure system platoons rather than collection and jamming platoons. The commander considered task organizing into collection and jamming platoons. Simplicity contributed to the decision to retain the reinforcing company assets in their pure configurations and give them the follow and support mission while the organic cavalry collection and jamming platoons were given the mission to maneuver with the lead squadrons.⁷⁸

Risk assessment is another component of maneuver warfare which was incorporated into CEWI schemes of maneuver. The example of Bravo Company (EW), 511th MI Bn (CEWI), (TE), demonstrates the types of risk assessment which occurred. Although originally reinforcing the 2nd ACR in its offensive covering force mission, the company had a "be prepared mission" to reinforce the lead divisions to weight the main effort with intelligence electronic warfare capabilities. Given the pace of operations, the availability of airborne systems, the lack of training on this mission, and the absence of a viable threat this mission was not executed. Although it would have been possible to move the unit to the corps' northern flank to reinforce 501st MI Bn (CEWI), it did not accentuate the maneuver of the entire unit.⁷⁹

Executing a company lateral move across the corps sector was determined to be too risky given the events as they unfolded. However, movement of a collection and jamming platoon across a division sector was essential to the 501st MI Bn (CEWI) scheme of maneuver. 2nd Platoon, Alpha Company, 501st MI Bn (CEWI) maneuvered with and supported all three maneuver brigades while conducting its general support mission.⁸⁰ Using the Intelligence Electronic Warfare Support Element (IEWSE) allowed the platoon leader and company commander to effect coordination with maneuver battalion and brigade commanders during the fast paced operations.

When questioned about the role doctrine played in their battalion schemes of maneuver, the CEWI commanders interviewed agreed that doctrine played a minimal role. All of the interviewed commanders recognized doctrine influenced their decisions, but experience and accumulated knowledge were more important. One commander admits to being a product of his experiences at the National Training Center while assigned to the 522nd MI Bn (CEWI). Another had assimilated his knowledge of doctrine while a tactics instructor at Fort Leavenworth. Finally, a third calculates the process at about seventy-five percent experience and twenty-five percent doctrine while admitting the doctrinal manuals did not arrive until the day before the ground war. Exactly how the

commanders translated the doctrinal guidance of "leapfrog to provide continuous coverage" is quite revealing.⁸¹

502nd MI Company (CEWI) was reinforced until its final task force configuration of six SIGINT collectors, three electronic intelligence (ELINT) collectors, five jammers, and three QUICKFIX rivaled the seventeen ground based and three aerial systems in a divisional CEWI battalion. The three phases of its operation were defensive covering force, offensive covering force for the two division movement to contact, and an offensive covering force for the massed corps hasty attack.⁸²

The defensive phase was closest to doctrinally correct. The use of SIGINT and ELINT baselines reinforced with QUICKFIX and available jammers closely approximated a defensive border environment which the units had experienced in Germany. Establishing the collection and jamming platoon leader as the liaison with the forward squadrons approximated the IEWSE found within the divisional structure.⁸³

The second phase resembles the doctrinal employment of a divisional collection and jamming company in a movement to contact as outlined in FM 34-12. However, the 1982 edition of FM 34-12, had been superseded by the 1987 edition of FM 34-10 and was technically obsolete.

The reinforcing EW company was used to establish a baseline at the border LD which was backed up by

QUICKFIX. Because the 2nd ACR movement preceded the remainder of the VII Corps they were able to establish a second baseline using the 502nd collection and jamming platoons inside Iraq. The initial baseline then displaced forward. The military intelligence task force had effectively leapfrogged companies vice platoons to provide coverage to the unopposed, both physically and electronically, LD crossing. At this point the scheme of maneuver diverged from the intelligence electronic warfare doctrine while supporting maneuver warfare doctrine. The focus shifted to rapid movement. QUICKFIX provided continuous coverage, while ground elements were prepared for immediate actions upon enemy contact.

The C&J platoons advanced with the squadrons in prearranged positions within their tactical formations. We gave B/511th a follow and support mission...Platoon and team drills were central to this phase's success with automatic, well rehearsed actions occurring at every halt.⁸⁴

In phase three, the regiment deployed three squadrons abreast and the task force deployed all collection and jamming assets forward. Having established conditions of electronic supremacy, the CEWI task force had successfully maneuvered as a member of the regimental combined arms team.

The major difference between the regimental task force and the divisional CEWI battalion is the presence of TRAILBLAZER. This system provides a unique direction finding capability and some additional maneuver

challenges. As already mentioned the combination of tracked vehicles with wheeled trailers resulted in the inability of four 124th MI Bn (CEWI) TRAILBLAZER trailers to maintain the tempo of the movement to contact. A conscious maneuver scheme moved the TRAILBLAZERS as a platoon rather than dispersing the assets throughout the division sector. 501st MI Bn (CEWI) divided Charlie Company into two EW platoons of TRAILBLAZER and TEAMPACK teams. The platoons moved along parallel routes in the center of the lead brigade balancing command and control against required lateral dispersion time.⁸⁵

The concept of operations for the 501st MI BN (CEWI) was divided into three phases: assembly area operations, movement to contact, and hasty attack. Since the 502nd MI Co (CEWI) had a requirement to establish a baseline to provide security for the corps assembly area, they transported military intelligence assets directly to the border during the movement from the tactical assemble area to the forward assembly area. The 501st MI Bn (CEWI) focused almost exclusively on maneuver training in the tactical and forward assembly areas.

The highlight of this training was the maneuver of the military intelligence battalion within the division scheme of maneuver during the rehearsal march from the tactical assembly area to the forward assembly area. This rehearsal validated the previous month of emphasis

on maneuver and provided confidence to the battalion and the division. Even after this successful rehearsal there was an attempt by the assistant division commander to reposition military intelligence assets behind the forward support battalion in the brigade wedge. The battalion commander with assistance from the G-2, the DIVARTY commander, and lead brigade commander convinced the general that the position of military intelligence assets was critical and belayed the action.⁸⁶

Preparation for the movement to contact phase began even before the battalion deployed to Saudi Arabia. In October 1991, while participating in a command post exercise (CPX), Alpha Company, 501st MI Bn (CEWI) conducted a field training exercise (FTX) to investigate the requirements for CEWI support for the flexible corps concept. The lessons learned from the FTX provided the nucleus for the battalion scheme of maneuver during the movement to contact phase of the Desert Storm.⁸⁷

Rapid deployment of the baselines after enemy contact guided the battalion's scheme of maneuver. This objective provided the focus for team, platoon, and company battle drills. Units emphasized doctrinal maneuver techniques and integration with the maneuver unit's scheme of maneuver. The electronic intelligence preparation of the battlefield confirmed a diminished threat and target array and also influenced the focus on

movement not collection during the movement to contact phase. Finally, as doctrinally proposed, QUICKFIX provided continuous aerial coverage to compensate for a lost ground capability.

Without the programmed pause, the third phase of the operation caught the military intelligence battalion slightly off guard. In order to meet the division commander's intent to prevent surprise, the battalion commander thought it critical the battalion "keep a foot on the ground at all times." This was even more significant than usual because the severe weather conditions jeopardized the QUICKFIX aerial capability.⁸⁸

The technique employed to accomplish this mission was a modification of the leapfrog technique which the author describes as a "rolling baseline." One collection and jamming platoon remained stationary and operational while the other two continued to move with the division. Every ten kilometers, which corresponded to an established phase line, another platoon stopped and established operations. The initial platoon then displaced forward passing through the new baseline and continuing to catch up with the moving division. As the initial platoon caught up with the division vanguard, the third platoon stopped and established operations, the second displaced forward and the first continued to move with the division.

The process was repeated for approximately sixty kilometers until the division initiated the hasty night attack. The trail platoons continued forward and displaced laterally behind the attacking brigades. The platoons supported the attack with one platoon located in each brigade's sector.⁸⁹ The flexibility and mobility demonstrated by the collection and jamming platoons during this hasty attack demonstrated that military intelligence teams can maneuver on the modern battlefield and support the heavy division.

This review of tactics, techniques, procedures reveals that intelligence electronic warfare doctrine had a minimal role in the maneuver of CEWI units on the Desert Storm battlefield. Much more important was a generation of leaders who were imbued with the spirit of AirLand Battle doctrine. Through initiative, CEWI commanders synchronized intelligence electronic warfare operations throughout the depth of the battlefield to provide agility and a maneuver warfare spirit to the electronic battlefield.

IMPLICATIONS FOR THE FUTURE

The Military Intelligence Corps is aware of many of the maneuver issues raised. The 1992 Branch Concept articulates the future vision of the US Army intelligence

branch. There are plans in effect that will address many of the shortcomings. However, there remain a number of unresolved issues which warrant closer examination.

The Ground Based Common Sensor (GBCS) is the system which will modernize army ground collection and electronic countermeasures. This state of the art system will replace the entire diverse single discipline systems currently deployed on the battlefield with a multidiscipline expert system which will provide SIGINT, imagery intelligence (IMINT), and measurement and signatures intelligence (MASINT).⁹⁰

Two versions of the system are currently planned: a light version mounted in a heavy HMMWV, and a heavy version mounted in a Bradley chassis Electronic Fighting Vehicle (EFV). Fielding of ground collection and jamming assets in a mobile and survivable tracked vehicle will finally address maneuver issues which have plagued military intelligence since the creation of CEWI. Unfortunately, two major maneuver issues will remain after this eagerly awaited system is fielded.

The first unresolved issue surrounding GBCS is the appropriate command and control arrangements. The heavy division is programmed to receive six GBCS's to replace the seventeen systems currently fielded. Two different proposals exist to distribute the GBCS. The first would allocate one to each brigade direct support military

intelligence company, with the remaining three in the divisional general support company. The alternate proposal which is incorporated into the most current concept plan allocates all six to the general support company. Division level allocation is critical because there will be no reinforcing corps GBCS. The shortfall will be alleviated by the fielding of the Advanced QUICKFIX (AQF). The required distribution for AQF is six per division, but only four are currently programmed.⁹¹

With only six (GBCS) available to support both the brigade and division fight, there will not be enough systems for everyone. Difficult prioritization issues will be raised. Additionally, although now possessing equal mobility to the maneuver forces, the procedures to maneuver critical single vehicle systems on the battlefield do not exist. When contrasted with the various displacement options available to artillery units, only the displacement by element will be feasible. GBCS will still require positioning near the FEBA and in proximity to dominate terrain. The coordination of passage of lines, emplacement, displacement, obstacle breaching, and logistic support requires a degree of maneuver savvy just developing within the military intelligence corps. The absence of a dedicated platoon and company structure to address these issues will place unreasonable demands on the team chief.⁹²

The second maneuver issue surrounding GBCS is the collocation of collection and jamming systems on the same vehicle. Even with technological advances, the collocation of a passive collection asset with an active jamming asset is a formula for failure. Any future opponent will know that these systems are essential to the division fight. A concerted enemy effort to identify, locate, target, and destroy the jamming system will likewise destroy the collection system.

The classical dilemma of battalion scout platoons highlights the issue. A scout platoon without a Bradley cavalry fighting vehicle is less likely to actively engage the enemy while conducting reconnaissance and surveillance. The capability of the Bradley tempts the passive collector into an active role. A similar dilemma faces the GBCS team. Given a limited number of operator positions, the GBCS team chief will have to balance his mission management between SIGINT collection, electronic support measures (ESM) collection, and active electronic countermeasures (ECM). The operator, system, and product are the same, but the strategies may differ.

Military intelligence branch is making a concerted effort to provide the best possible intelligence electronic warfare support within the anticipated constrained resource environment. GBCS is one of Military Intelligence's flagship programs receiving

priority attention and funding. Two other flagship systems are the Joint Surveillance Target Acquisition Radar System (J-STARS) and Unmanned Aerial Vehicles (UAV). Just as the army of the seventies was enamored with electronic warfare and SIGINT, today's army is enthralled by imagery intelligence and its associated J-STARS and UAV systems.

One of the most important lessons learned from the fielding of the SIGINT heavy CEWI organization is the potential exists to repeat mistakes with the IMINT CEWI organization. The Common Ground Station (CGS) is the system by which future IMINT and SIGINT will be transmitted to the commander. Current fielding plans include a large number of HMMWV mounted systems.

A definite mobility and survivability potential exists if these systems are to support maneuvering brigade and division commanders on future battlefields. A conscious investment is required to field these systems in the same command and control vehicle from which the commander operates. The lessons learned by Air Force Air Liaison Officers (ALO) and Fire Support Officers (FSO) and their associated command and control vehicles are definitely applicable.

The 1992 Branch Concept is aware of the doctrinal impacts of the quickly changing Intelligence System of Systems (ISOS). An appendix on doctrine discusses the

required changes in doctrinal focus to provide multidisciplined support. The evolution of FM 34-1 and linking it with FM 100-5 is also recognized. "State of the art Tactics, Techniques, and Procedures (TTP) for applying the equipment, systems, and doctrine of ISOS to the particular needs dictated by METT-T should be distributed in Training Circulars (TC)."⁹³

A word of caution about doctrinal continuity is required. Most of the systems discussed in the Branch Concept and designed for the ISOS will not be fielded for ten or more years. In the interim, the Army will continue to operate with what it has already fielded. Doctrinal shortfalls and TTP's are required which solve today's problems. It must be remembered, the design, fielding, and wartime employment of the Abrams tank and Bradley infantry fighting vehicle took twenty years. For many years tank and infantry battalions had third generation TTP, but only second generation equipment. Viable tactics, techniques, and procedures for CEWI maneuver are required for the interim until ISOS does become a reality. Commanders deserve the best intelligence and electronic warfare operations, including maneuver, CEWI soldiers and leaders can provide. Desert Storm proved focussed maneuver training assures CEWI can maneuver on the battlefield.

CONCLUSION

The classical theories of maneuver introduced maneuver as a component of warfare. US Army maneuver doctrine expanded this definition by recognizing maneuver as an element of combat power, a principle of war, and a style of warfare. Intelligence electronic warfare doctrine slowly adjusted to the requirements of these various definitions of maneuver.

The tactics, techniques, and procedures employed by the heavy division military intelligence battalions (CEWI) during Desert Storm demonstrate that CEWI can maneuver on the modern battlefield. Understanding US Army maneuver warfare doctrine and intelligence electronic warfare doctrine, CEWI leaders maneuvered their units and conducted maneuver warfare.

Successful maneuver is a precondition to providing a viable combat multiplier. As military intelligence transitions to the future, this fundamental precept must not be forgotten. The lessons learned during the transition from active defense to AirLand Battle must be incorporated into the next generation of intelligence electronic warfare equipment, organizations, and doctrine. Maneuver warfare doctrine must be central to the intelligence doctrine because it is pivotal that CEWI continues to maneuver on the modern battlefield.

ENDNOTES

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17. Ibid., 346.
18. US Army, FM 100-5, Operations (Washington DC: Department of the Army, 1954), 26.
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24. LTC (P) Huba Wass de Czege and LTC L. D. Holder, "The New FM 100-5," Military Review, 62, no. 7 (July 1982): 54.
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34. Ibid.
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37. Col James R. McDonough, "Building the New FM 100-5: Process and Product," Military Review, 71, no. 10 (October 1991): 10.

38. Joint Chiefs of Staff, Publication 1-02 Department of Defense Dictionary of Military and Associated Terms (Washington, DC: Office of the Chairman, Joint Chiefs of Staff, 1989), 218. JCS Pub 1-02 lists four definitions of maneuver used by Department of Defense. 1. A movement to place ships or aircraft in a position of advantage over the enemy. 2. A tactical exercise carried out at sea, in the air, on the ground, or on a map in imitation of war. 3. The operation of a ship, aircraft, or vehicle, to cause it to perform desired movements. 4. Employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect to the enemy in order to accomplish the mission.

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42. Ibid., 6.

43. The manuals are: (S) FM 30-18 Intelligence Collection Operations (U) November 1875, (S) FM 32-10 (Test) United States Army Security Agency in Support of Tactical Operations (U) August 1976, (C) FM 32-20 Electronic Warfare (U) September 1970, (S) FM 32-20-1 Electronic Countermeasures (U) Mar 1970, and (S) FM 32-1 SIGINT (U) August 1975. Although not elaborate, the plan for continuous operations is confidential, preventing a more detailed examination.

44. FM 100-5, Operations, 1976 edition, 3-8.

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46. Ibid., 9-6 to 9-8.

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50. Ibid., 38.
51. Ibid., 31.
52. An excellent example of how complicated the activation of a CEWI battalion could be is LTC Richard Sheridan's article "CEWI: From Concept to Reality," in the October/December 1980 issue of Military Intelligence magazine, which highlights the activation of 533rd MI Bn in Europe.
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54. MAJ Charles W. Thomas, "Combat Intelligence for the Deep Attack," Military Review, 63, no. 4 (April 1983): 48. and Col Leonard G. Nowak, "Division Intelligence: Left in AirLand Battle's Dust?," Military Review, 62, no. 11 (November 1987): 54.
55. Nowak, "AirLand Battle Dust," 53.
56. Thomas, "Deep Attack," 49.
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60. US Army, FM 34-35, Armored Cavalry Regiment and Separate Brigade Intelligence and Electronic Warfare Operations (Washington, DC: Department of the Army, 1990), 4-2.
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63. FM 100-5, Operations, 1992 Preliminary Draft edition, 2-12.
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65. US Army, FM 6-20-1, Tactics, Techniques, and Procedures for The Field Artillery Cannon Battalion (Washington, DC: Department of the Army, 1990), 3-19 to 3-20.
66. US Army, FM 44-3, Air Defense Artillery Employment: Chaparral/Vulcan/Stinger (Washington, DC: Department of the Army, 1984), 11-6.
67. FM 6-20-1, Field Artillery Cannon Battalion, 3-23.
68. Ibid., 2-5.
69. Thomas, "Deep Attack," 47. The phrasing is a rework of MAJ Thomas description of a previous generation of assets.
70. The exact nomenclatures of the systems are: AN/APR-39(V)2, M-130, AN/ALQ-144(V)1, Hover IR Suppressor System, AN/ALQ-136(V)2, AN/ALQ-156(V)2, AN/ALQ-162(V)2, and AN/AVR-2. Complete descriptions can be found in chapter four of FM 34-10-7, QUICKFIX Operations, 30 September 1991.
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72. LTC Robert Reuss, Commander, 124th MI Bn (CEWI), telephonic interview with author, 10 November 1992.
73. Nowak, "AirLand Battle Dust," 55.
74. Based on the personal observation of the author.
75. Westwood, "Maneuver: A Broadened Concept," 18.
76. LTG William R. Richardson, "Training for Maneuver Warfare," Armor, 50, no. 4 (July-August 1981): 31.
77. Personal observation of author, confirmed with telephonic interview with LTC Seth Nottingham, Commander, 501st MI Bn, 6 November 1992.

78. MAJ Daniel Baker, "Deep Attack: A Military Intelligence Task Force in Desert Storm," Military Intelligence, 17, no. 4 (October-December 1991): 40. The initial ideas contained in the article were expanded during a telephonic interview with LTC Baker, 9 November 1992.

79. Based on telephonic interviews with LTC Seth Nottingham, Commander, 501st MI Bn (CEWI) and LTC Dan Baker, Commander, 502nd MI Co (CEWI).

80. Personal observation of the author confirmed during telephonic interview with LTC Seth Nottingham, Commander, 501st MI Bn (CEWI).

81. Based on telephonic interviews with the three commanders and their answer to the question, How doctrine influenced their preparation and execution?

82. Baker, "A Military Intelligence Task Force," 40. Article ideas were supplemented through a telephonic interview.

83. Ibid.

84. Ibid., 41.

85. Personal observation of the author and telephonic interview with LTC Reuss, Commander, 124th MI Bn (CEWI) and LTC Nottingham, Commander, 501st MI Bn (CEWI).

86. Telephonic interview with LTC Nottingham, Commander, 501st MI Bn (CEWI).

87. Personal observations of the author confirmed during telephonic interview with LTC Nottingham, Commander, 501st MI Bn (CEWI).

88. Telephonic interview with LTC Nottingham, Commander, 501st MI Bn (CEWI).

89. Personal observations of the author confirmed during telephonic interview with LTC Nottingham, Commander, 501st MI Bn (CEWI).

90. US Army, FM 34-10-2, Intelligence and Electronic Warfare Systems (Washington, DC: Department of the Army, 1991), 2-25. The GBCS will replace the AN/TRQ-30, AN/TRQ-32(V) TEAMMATE, AN/MSQ-103 TEAMPACK, AN/PRD-11, AN/PRD-11, AN/PRD-12, AN/TSQ-138 TRAILBLAZER, AN/PPS-5 and AN/PPS-15 Ground Surveillance Radars, Remotely Monitored Battlefield Sensor System (REMBASS), AN/TLQ-

17(V) TRAFFICJAM, and the AN/MLQ-34 TACJAM.

91. US Army Intelligence Center, U.S. Army Intelligence Branch Concept Coordinating Draft (Revised) 15 June 1992 (Fort Huachuca, Arizona: Directorate of Combat Developments, U.S. Army Intelligence Center, 1992), 37-38.

92. Regardless of the final fielding plan, fewer leaders will be involved in the process. The existing command and control structure to coordinate SIGINT assets includes two commanders and first sergeants, five platoon leaders and platoon sergeants, and seventeen team chiefs. This structure will be replaced by four multidiscipline company commanders and first sergeants who will have assets scattered throughout the division and brigade areas of operation. The requirements of providing multidiscipline direct support to the brigade will force the direct support commanders to locate near the brigade command post. This may not be the optimal location on a complex mobile battlefield when such essential operations as orders briefings, rehearsals, vehicle recovery, maintenance, or passage of lines are required. The one platoon leader and platoon sergeant will have the mission to coordinate six teams scattered throughout the division. Having observed an exceptionally talented TRAILBLAZER platoon leader attempt to command and control five TRAILBLAZERS during REFORGER 90, the author is extremely skeptical that this is possible. This leaves the six team chiefs to coordinate directly. The author believes the staff sergeant team chief should not be primarily responsible for the multitude of coordination issues which exist on the battle field. The team chief must command his team and fight his system. The command and control system must establish the conditions which allow him to do this.

93. US Army Intelligence Center, Branch Concept, 61.

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