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Combat Engineers -- A Neglected Reconnaissance Asset?

A Monograph
by

Major William J. Bayles
Corps of Engineers

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United States Army Command and General Staff College
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This monograph investigates the idea of utilizing heavy force combat engineers to assist with intelligence collection efforts. Tactical commanders face large reconnaissance requirements but have limited assets to meet them. Supporting engineers have the potential of helping satisfy some of the commander's critical information requirements.

The monograph examines reconnaissance roles of combat engineers in the World War II era, as well as that of both U.S. and Soviet combat engineers today. U.S. reconnaissance doctrine is examined in light of its contribution to tactical intelligence. The study compares the current practice of the U.S. Army to our current combined arms and intelligence doctrines and to successful tactics and doctrine from the other armies and times. It also compares the reconnaissance training of combat engineers and cavalry scouts to determine if engineers have missions congruent with increased reconnaissance responsibilities.

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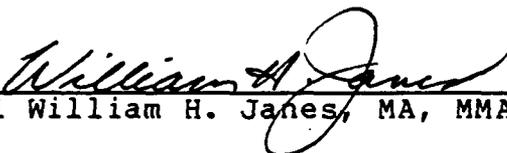
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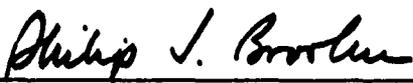
Major William J. Bayles

Title of Monograph: Combat Engineers--A Neglected
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Approved by:


Lieutenant Colonel John P. Dunigan, MA Monograph Director


Colonel William H. James, MA, MMAS Director, School of
Advanced Military
Studies


Philip J. Brookes, Ph.D. Director, Graduate
Degree Program

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Abstract

COMBAT ENGINEERS--A NEGLECTED RECONNAISSANCE ASSET? by Major William J. Bayles, U.S. Army, 44 pages.

This monograph investigates the idea of utilizing heavy force combat engineers to assist with intelligence collection efforts. Tactical commanders face large reconnaissance requirements but have limited assets to meet them. Supporting engineers have the potential of helping satisfy some of the commander's critical information requirements.

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Section I. Introduction

**Moses sent them to spy out the land of Canaan, and said to them, "Go up into the Negeb yonder, and go up into the hill country, and see what the land is, and whether the people who dwell in it are strong or weak, whether they are few or many, and whether the land that they dwell in is good or bad, and whether the land is rich or poor, and whether there is wood in it or not. Be of good courage and bring some of the fruit of the land."
-Numbers 13:17-20**

Throughout the history of warfare, commanders have valued effective reconnaissance. Moses sent leaders from the twelve tribes of Israel to "spy out" the land of Canaan. Napoleon dispatched trusted subordinates to evaluate the terrain in preparation for campaigns. Karl von Clausewitz valued accurate intelligence and reports, though he reminded his readers that they must cut through false intelligence and outright lies streaming into their headquarters.

With the value of effective reconnaissance established in history, it's surprising that the U.S. Army had to relearn its value at the National Training Center (NTC). During the past several years, the topic of reconnaissance has dominated discussions of heavy force operations. These focus on the effectiveness of the opposing forces (OPFOR) reconnaissance, how U.S. forces can counter it, the relative ineffectiveness of U.S. reconnaissance, and the proper organization and equipment for battalion scout platoons.

Results indicate that as a whole, the U.S. Army has not mastered reconnaissance for a variety of reasons. Based on journal articles and bulletins, one is tempted to conclude that battalions have to solve the reconnaissance equation during their NTC rotation. Many observations deal with the organization and planning of the intelligence collection effort. Often, too few assets are allocated because the commander is constrained by available time and forces. Poor templating leads to wasted effort. Scouts get "killed" during the mission. These, along with proposed solutions via new or different equipment form an endless debate filling pages of branch magazines and lessons-learned bulletins.

The research question of this monograph is to determine whether combat engineer units and soldiers should be assigned terrain reconnaissance missions forward of maneuver forces, or whether such missions should be left to cavalry units and scout platoons. If the analysis indicates that such missions require engineer soldiers, a secondary question arises: determining whether the engineers should be amalgamated in scout patrols, or should work independently.

Augmenting the intelligence collection efforts of battalions and brigades with combat engineers could potentially increase their information gathering capability. Such capability comes at a price, however. Doctrine, tactics, patrol procedures, types of collection, stealth, enemy capabilities, and terrain all enter into the cost-benefit analysis facing the commander.

This monograph examines a number of issues impacting on this analysis. It begins by examining the historical precedents for engineer reconnaissance from World War II. Operations of the German Wehrmacht, the Red Army of the Soviet Union, and the U.S. Army disclose procedures and organizations that contributed to the success or failure of the force as a whole. Examining current Soviet doctrine provides a link to the lessons of World War II. Finally, the monograph focuses on current U.S. doctrine, training, and application.

The following definitions are provided to aid readers of this monograph:

Engineer soldier--a soldier trained or working in MOS's 12B (Combat Engineer), 12C (Bridge Crewman), or 12F (Engineer Tracked Vehicle Crewman) and their equivalents in the force being discussed.

Engineer unit--a military formation comprised chiefly of engineer soldiers and offering close combat support to maneuver forces. Examples are engineer battalions in U.S. divisions, their subordinate formations, and engineer companies in Soviet regiment-sized formations. In this monograph, this excludes technical engineer units such as construction or firefighting units.

Scout--a soldier trained or working in MOS 19D (Cavalry Scout) and his equivalent in the force being discussed.

Scout platoon--the reconnaissance and security platoon organic to a

U.S. maneuver battalion.

Intelligence--"the product resulting from the collection, evaluation analysis, integration, and interpretation of all available information" on the enemy and area of operations having military significance.¹

Terrain intelligence--information concerning effects of terrain on friendly and enemy operations.²

Tactical intelligence--intelligence of particular value for maneuver units such as enemy dispositions and strengths.

HUMINT(Human Intelligence)--intelligence derived from human observation such as prisoners of war, refugees, or friendly forces.

Reconnaissance--the act of gathering information about the enemy and terrain in a given area through observation or measurement. This is generally a subset of HUMINT, but may also employ electronic, photographic, or other means.³

The monograph focuses on reconnaissance activities of heavy forces for two reasons. First, heavy forces are likely to require more engineer support for their passage over obstacles due to the high density and dependence upon vehicles. Secondly, heavy forces comprise the bulk of the U.S. Army and are the focus of the current reconnaissance debates. This focus prevents the analysis from being exhaustive, but provides sufficient evidence to support the conclusions.

¹Department of the Army, *Field Manual 34-1, Intelligence and Electronic Warfare Operations*, Washington, D.C., HQ, Department of the Army, July 1987, p. 2-8.

²*Ibid.* p. 2-11.

³*Ibid.* p. 3-35.

Section II. Historical Examples

The Second Battle of Schmidt illustrates a costly failure of terrain intelligence. On 2 November 1944, the 28th Infantry Division launched an attack toward Schmidt, Germany to seize its road junction thus gaining maneuver space and additional supply routes for future operations. The attack also drove the allies close to one of several large and operationally important dams on the Roer River.⁴ The plan of attack called for elements of the 112th Infantry Regiment to secure the village of Schmidt, with supporting armored forces following to blunt the edge of any German armored counterattacks. Thus the division's success depended upon getting armored vehicles to Schmidt.

The V Corps Commander assigned General Norman D. Cota's 28th Infantry Division an important objective and allocated many assets to support its attack. A towed antitank artillery battalion added its fires to the tank battalion and tank destroyer battalion normally attached to the division. The bulk of V Corps artillery and the entire 1171st Engineer Combat Group supported the division in this operation.

The "Keystone Division," so named to reflect its Pennsylvania National Guard origins, needed all the help it could get. In addition to a resolute enemy, it fought very difficult weather and abominable terrain. The weather in the region was wet and cold, though generally above freezing in early November. Constant rains soaked the ground so roads quickly became quagmires under almost any type of traffic. The clouds and low ceilings associated with the rain grounded U.S. aircraft charged with isolating the Schmidt battlefield from German reserves.⁵

The terrain was perhaps more hostile than the weather, because between the 28th Division and its objective was the steep-sided valley of the Kall River. This gorge was over a thousand meters wide and about one hundred fifty meters deep.

⁴Charles B. MacDonald and Sidney T. Mathews, *The United States Army in World War II. The European Theater of Operations, Three Battles: Arnville, Altuzzo, and Schmidt*, Washington, D.C., Center for Military History, 1952, p. 251.

⁵Charles B. MacDonald, *The United States Army in World War II. The European Theater of Operations, The Siegfried Line Campaign*, Washington, D.C., Center for Military History, 1984, p. 345.

The sides were thickly forested, and only one cart track offered the potential for armored or supply vehicles to cross. In evaluating the terrain, Charles MacDonald, author of two official histories of this attack assessed the situation: "General Coda could only hope that the cart track across the Kall, which had to serve as a main supply route, would prove negotiable: on aerial photographs parts of the track did not show up."⁶

Even though the trail and the bridge across the Kall River were vital to the success of the operation, the 28th Division did little to ascertain their condition. The division relieved the 9th Division on 26 October, and planned to attack on 31 October. The attack was later pushed back to 2 November. Thus, time for intelligence collection was available. The 1171st Group tasked its 20th Engineer Battalion to provide three reconnaissance teams. The 3d Battalion, 112th Infantry had an experienced patrol section led by its S-2, 1LT Greene, and known as the "Greene Hornets." Though assets for reconnaissance were available, little patrolling occurred because of the presence of the enemy and the forbidding terrain.⁷ After the attacking infantry passed through the gorge on 3 November, sketchy and false information was passed back to decisionmakers concerning the conditions of the trail and bridge. As the 3d Battalion dislodged German defenders from Schmidt, the "Greene Hornets" guarded the battalion's flank north of the gorge and never traversed the treacherous trail.

Because the conditions in the gorge were unknown to the leaders who could focus engineer effort, the trail remained a bottleneck. The 20th Engineer Battalion's primary mission was to clear the trail and it had assigned its A and B Companies to the task. Mobility efforts started on the trail only after nightfall on 3 November and only three platoons of engineers worked on the trail during the night. These soldiers worked with hand tools until a bulldozer arrived in the middle of the night and worked for about an hour before it broke down. The 20th Engineers did not employ other assets until after the afternoon of 4 November when General Cota personally ordered the 1171st Group commander to send "a competent officer" to take charge of

⁶Tbid.

⁷MacDonald. *Three Battles...* p. 255.

the trail clearing operation.⁸

The engineer effort was clearly too little and too late to relieve the bottleneck. Three small tracked vehicles called weasels carried supplies to Schmidt during the night of 3-4 November and three tanks traversed the gorge with great difficulty on the morning of 4 November. This support was likewise too little and too late, as the Germans counterattacked that morning. Their tank and infantry force drove the Americans out of Schmidt. The fight for Schmidt continued for several more days. Some additional vehicles managed to traverse the difficult Kall Gorge, but the 20th Engineers never made it an acceptable supply and reinforcement route. The disabled tanks from the first abortive attempts to force the passage blocked the trail.

Had General Cota been provided accurate information concerning the difficulties that the Kall Gorge would present his division, he could have devised a plan to overcome the obstacle. The most crucial engineer asset at his disposal was a command structure to oversee the mobility efforts on the trail and insure that resources were ready to start the work as soon as the area was secured. However, absent terrain intelligence hobbled General Cota's operation from the start. The Kall Gorge cost the Keystone Division's success at Schmidt.

U.S. Army planning for Rhine River crossings the following spring reflected costly experiences such as the Battle of Schmidt. In contrast to the operation of the 28th Infantry Division, the 79th Infantry Division conducted extensive reconnaissance prior to Operation Flashpoint--the crossing of the Rhine.

Extensive terrain reconnaissance was a vital part of the preparation for Operation Flashpoint. During planning stages, the corps engineer merged the S-2 sections of the supporting 1148th and 1153d Engineer Combat Groups. These staff sections coordinated an intelligence collection effort (and performed their own reconnaissance) to determine detailed information of the crossing area and the river. They focused on determining soil trafficability, as well as locating potential bridging, rafting, and assault sites. All sites were further reconnoitered by the infantry commanders accompanied by engineer leaders down to the platoon level. During the

⁸ibid. p. 313.

actual assault operation on 24 March 1945, the divisional engineers crossed in the first wave and reconnoitered routes of advance, mines, and found weak spots in the German obstacles on the far shore. Operation Flashpoint was a walkover because there was almost no enemy resistance, however extensive terrain intelligence enabled the 79th Division to accomplish detailed planning and rehearsals vital to heavily opposed crossings.⁹

Combat engineers in the European and Mediterranean Theaters frequently conducted terrain reconnaissance and evaluation missions. There are also examples of engineers augmenting maneuver forces during reconnaissance operations. To summarize, even though "there was initially a marked reluctance to permit engineers to collect their own intelligence and put it into a form suitable for use by engineers..."¹⁰, they contributed to intelligence collection efforts throughout the European Campaign.

The U.S. Army organized and equipped the combat engineer battalions of World War II much like the wheeled corps combat battalions of today. The nondivisional combat battalion was identical to its counterpart in the infantry division. These units had organic reconnaissance sections,¹¹ as did the Armored Engineer Battalions of the Armored Divisions.¹² The Headquarters and Headquarters Company of the Engineer Combat Group also had a reconnaissance section. Doctrine charged the group S-2 to be a combined collection planner, intelligence agency, and liaison with division G-2's.¹³

Like the structure to support the reconnaissance mission, doctrine and training heavily favored engineer reconnaissance. Every mission outlined for combat engineers by FM 5-6, *Engineer Field Manual: Operations of Engineer Field Units* placed reconnaissance as the first step. This manual devoted an entire chapter to

⁹Headquarters, 79th Infantry Division, *After Action Report: 79th Infantry Division Crossing of Rhine. 24 March 1945, 15 May 1945.*

¹⁰Headquarters, European Theater, *Final Report of the Chief Engineer, ETO. 1942-45. Volume 1, p. 90.*

¹¹Field Manual 5-5, *Engineer Field Manual: Engineer Troops*, Washington, D.C., HQ, Department of the Army, 11 October 1943, p. 53-54.

¹²George Forty, *U.S. Army Handbook, 1939-45*, New York, Charles Scribner's Sons, 1979, p. 64.

¹³Field Manual 5-5, p. 4.

reconnaissance, outlined sources of terrain information, and defined engineer reconnaissance as "searching for engineer information--topography, resources, information on enemy installations and activities affecting engineer operations."¹⁴ FM 5-5 indicated that the engineer headquarter's S-2 at all echelons was responsible for the collection plan, gathering and evaluating engineer information and supervising reconnaissance training.¹⁵ Outside the engineer community's doctrine, the combat engineer was clearly expected to make a contribution, as indicated by FM 100-5, *Operations*: "Small engineer groups should constitute a portion of ground reconnaissance units to obtain and report information concerning routes of communication and movement, demolitions, land mines, and obstructions."¹⁶

History shows that combat engineers were organized, trained, employed for reconnaissance during World War II. Sometimes the engineer S-2's effort was duplicated by his maneuver counterpart, or information wasn't shared soon enough, but the system established by the doctrine produced the necessary information most of the time. Nevertheless, the European Campaign provided the example of the tragic cost of no terrain intelligence--the Battle of Schmidt.

The idea of using combat engineers to conduct terrain reconnaissance was not a purely American idea. As early as 1937, Colonel Heinz Guderian advocated that engineers accompany reconnaissance elements leading Panzer thrusts.¹⁷ The Soviet Army also tasked its engineers for intelligence collection. Before exploring contemporary practice, consider the application of engineers to reconnaissance by the German and Soviet Armies of World War II.

The Polish and French campaigns of 1939 and 1940 provided examples of engineer reconnaissance in the Wehrmacht. As a general rule, several echelons of advance troops, including engineers preceded the panzer forces. Their mission was to test and repair bridges and conduct road reconnaissance to speed the passage of the main body. They undertook only limited repairs or breaches to maintain the

¹⁴Field Manual 5-6, *Engineer Field Manual: Operations of Engineer Field Units*, Washington, D.C., HQ, Department of the Army, 23 April 1943, p. 25.

¹⁵FM 5-5, p. 13.

¹⁶FM 100-5, *Operations*, Washington, D.C., HQ, Department of the Army, 15 June 1944, p. 5.

¹⁷Heinz Guderian, "Armored Forces," *Infantry Journal*, Vol. 44, No. 5, p. 43, Sep-Oct 1937.

momentum of the attack.¹⁸

An example of this employment was the action of the 3d Company of the 19th Engineer Battalion near the Albert Canal in May 1940. Captain Paul Thompson, a prewar observer of the Wehrmacht for the U.S. Army, wrote of the unit performing "one reconnaissance mission after another," locating road blocks and devising means to bypass or breach ahead of the main columns.¹⁹ In the same campaign, Lieutenant Grubnau, the commander of a special bridging company braved fires from French machine guns on the west bank of the Meuse to reconnoiter the approaches and banks of the river. Grubnau's action speeded the passage of tanks leading Guderian's Armored Corps past Gaulier. As Lieutenant Colonel Hermann Balck's 1st Rifle Regiment was finishing its assault and General Guderian anxiously waited, Grubnau's unit began assembling a ferry.²⁰ The timely reconnaissance by Lieutenant Grubnau at 1630 on 13 May 1940 enabled his unit to begin ferrying vehicles across the river within an hour, and to complete a sixteen ton capacity bridge by midnight.²¹ Thus the hasty reconnaissance by a combat engineer was crucial to the momentum of the blitzkrieg attack.

Although not specifically organized for terrain reconnaissance, the Wehrmacht's engineer troops satisfied this requirement with small sapper detachments, often led by officers and commanders. The engineer battalion of the infantry division contained three companies. One company was motorized, but the other two that were foot mobile, with heavy equipment in horse-drawn wagons. There was no dedicated reconnaissance element in the formation.²² Often, the commander of the supporting engineer unit did the force's terrain reconnaissance, as did Lieutenant Grubnau. The Wehrmacht also employed patrols, consisting of a lieutenant and enlisted men on motorcycles ahead of the advancing columns. This practice was often costly. One such patrol of the 57th Engineer Battalion suffered

¹⁸F.O Miksche, *Attack: A Study of Blitzkrieg Tactics*, New York, Random House, 1942, p. 21-22.

¹⁹Paul W. Thompson, *Engineers in Battle*, Harrisburg, PA, Military Service Publishing Company, 1942, p. 27.

²⁰Alistair Horne, *To Lose a Battle: France 1940*, Boston, Little, Brown, and Company, 1969, p. 342.

²¹Horne.

²²Thompson, *Engineers in Battle*, p. 1. and Thompson, "Engineers in Blitzkrieg," *Infantry Journal*, Volume 47, Number 5, pp. 424-432, September-October 1940.

three killed during an encounter with a French tank during operations on 18-19 May 1940. Thus the momentum of the blitzkrieg was due to the aggressive employment of engineers having little specialized equipment for terrain reconnaissance--the sapper's eyes and ears were the main intelligence collectors.²³

Like the Wehrmacht, the Red Army aggressively employed its engineers, however it centered more on the enemy and his fortifications than on the terrain. In the 1984 edition of *Combat Engineer Support*, Kolibernov and his co-authors write:

The goal of reconnoitering enemy defenses was to discover the nature of their engineer support and most of all, to establish the presence and disposition of barriers and the types of mines employed. Engineer observation posts (INP), reconnaissance and search groups were designated for reconnaissance and sappers were assigned to subunits and units conducting reconnaissance in battle...²⁴

Soviet commanders closely integrated the extensive reconnaissance efforts of their engineers during planning. The Chief of Engineer Troops cooperated closely with the Chief of Intelligence on reconnaissance taskings. At large unit levels this collection effort was a systematic "step by step operation" that began with map and aerial photo studies, employed questioning of partisans and enemy prisoners, and then assigned reconnaissance tasks on a mission or area basis that gathered detailed terrain information. Lower echelons of command repeated the processes, resulting in extensive terrain intelligence that supported "comprehensive engineer plans that covered all rivers and major terrain features."²⁵

The Red Army's engineer units organized in a variety of ways to collect information. A few units contained reconnaissance detachments and higher level staffs had special reconnaissance sections.²⁶ Generally, units of sappers organized and trained for the mission as an additional duty conducted reconnaissance. When employed for reconnaissance, such a detachment was called an IRD (*inzhenernoe razvedyvatel'nye dozor*-engineer reconnaissance patrol). By 1944, the engineer

²³Ibid.

²⁴Yevgeniy S. Kolibernov, et.al., *Inzhenernoe Obespecheniye Boya* (translation: *Combat Engineer Support*), Moscow, 1984, (Translated by Foreign Broadcast Information Service, Report JPRS-UMA-085-020-L, 26 August 1985), (FOUO), p. 18.

²⁵Barry W. Fowle, "Soviet Engineer Support to River Crossing Operations in the Great Patriotic War.," *Engineer*, Volume 17, No. 1, p. 37, 1987.

²⁶Ibid.

sapper battalions of rifle divisions designated one platoon as a scout platoon and gave it special training as such. Observation posts (INP) were manned by nearly any properly briefed individual, but were sometimes supplemented by photography. Often, units already in contact supplied troops for IRD's and INP's to mask attack preparations or the identity of units earmarked for upcoming operations. Such groups were especially active during breakthrough preparations and the resulting terrain intelligence was generally credited with the success of exploitation and pursuit operations.²⁷

Patrols and observation posts used a variety of methods to gather information and completed their missions under many adverse conditions. Engineers of the 7th Guards Army of the Steppe Front used both ground reconnaissance and aerial photos to investigate a river channel diverted from the old river bed by demolition of a hydropower plant at Dnepropetrovsk. The 57th Combat Engineer Brigade sent four platoons, and the 104th Ponton Bridge Battalion sent one platoon in a combined IRD to survey low water and float bridge sites which were covered by German defenders' fire.

One standard technique was for engineer patrols to go behind enemy lines in preparation for deep operations. The 27th Army of the 2d Ukrainian Front dispatched an IRD from the 4th Assault Combat Engineer Brigade during the period 4-9 March 1944. This group moved 15 kilometers behind the German front line locating six fords and 26 bridges for use in the operation that culminated with the encirclement of the First Panzer Army. During the Vistula-Oder offensive in January 1945, some IRDs were given motor vehicles while others were airdropped. During this fluid operation engineer subunits operated with maneuver force combat reconnaissance patrols to capture and hold river crossings.²⁸ Engineers also conducted raids to complete the intelligence picture. During Vistula-Oder, the 1st Ukrainian Front launched 118 raids in both "tactical and operational depth of enemy defenses," while the 47th Army of the 1st Belorussian Front made 45 raids in the four days immediately prior to the offensive. These enabled planners to determine their own engineer task

²⁷Kolibernov, p. 18.

²⁸Fowle.

organization and breaching methods.²⁹

Soviet engineer reconnaissance evolved and expanded in scope during the war. Throughout the conflict, detailed and centralized planning ensured that it supported the maneuver plan. As the war continued, the Soviets refined their techniques and organizations, concentrating more on enemy fortifications and dispositions rather than maintaining the terrain orientation of the Wehrmacht and U.S. Army engineers. The Soviets expected their engineers to collect information behind enemy lines or in front of friendly formations where enemy contact was likely. The effectiveness of their efforts were measured in the successes of mobile operations that characterized the final year of the war.³⁰

²⁹Kolibernov, p. 37.

³⁰Fowle.

Section III. Current Reconnaissance Doctrine

Before analyzing the tactical reconnaissance practices of the U.S. Army, it is instructive to investigate the doctrine of the Soviet Army. No other army has applied the experiences and lessons of World War II so thoroughly and systematically as the Soviets.

A study of Soviet reconnaissance doctrine provides valuable insights for the U.S. Army. The Soviets have studied thoroughly and have written extensively about the subject. They integrate reconnaissance with intelligence and maneuver at all levels—even making it a part of their troop leading procedures.³¹ The proof of their effectiveness may be seen in their operations during the closing year of World War II. Additionally, U.S. Army personnel may have to counter Soviet reconnaissance in the future.

To the Soviets, reconnaissance is part of a larger, more all-encompassing concept called *razvedka* which embraces a wide variety of important activities. *Razvedka* includes intelligence, target acquisition, reconnaissance, analysis, intelligence production, and dissemination. Marshall Sokolov highlighted the importance of thorough reconnaissance with direct reference to the Soviet "Great Patriotic War" of 1941-45:

The entire experience of the war, both of some failed operations at its beginning and of successfully conducted ones in its subsequent periods, showed convincingly that success in battle depends first and foremost on how carefully the enemy has been reconnoitered and how accurately and reliably fire has been delivered on the major objectives and targets of his defenses.³²

With this opinion concerning the importance of reconnaissance in defeating the enemy and locating his defenses for destruction by fire, it's not surprising to find that the Soviets make reconnaissance the responsibility of all units. The emphasis begins at the highest levels where the Soviets use centralized planning to coordinate the

³¹Varenyshev, B.V., et al., *Voyenno-Inzhenernaya Podgotovka*, (Translation: *Military-Engineering Training*), Moscow, 1982, (Translated by Foreign Technology Division, Wright-Patterson AFB, Ohio, Report FTD-ID(RS)T-0531-83, 27 October 1983.), p. 384.

³²Michael Dueveke, "Soviet Reconnaissance: An Overview," *How They Fight*, pp.15-18, April-June 1988.

intelligence collection effort. There is even a Chief of Reconnaissance at some levels of command who works directly for the Chief of Staff.³³ Within the structure of divisions and regiments, dedicated reconnaissance units conduct *voyskovaya razvedka*--troop reconnaissance that is primarily enemy focused. Even with redundant organic units, Soviet doctrine emphasizes that reconnaissance must be done continuously, at every level of command, and by all troops.

Keeping with this doctrine, engineer reconnaissance is an integral part of *razvedka* at the tactical level, playing an important part in the planning of operations. The Soviets consider mobility operations conducted by supporting engineers to take increased importance with increasing mechanization of ground forces³⁴ and with their desire to seek surprise by advancing on difficult, improbable axes.³⁵ With this comes increased importance of engineer reconnaissance, listed in multiple sources as a primary engineer task. This mission focuses on both terrain reconnaissance and locating enemy forces. The information provided is used by maneuver forces to plan operations and by engineer staffs to plan support missions.³⁶

Both organic subunits and task organized formations allow the Soviet engineer to fulfill his reconnaissance mission. Many of the formations or units may work as subsets of one another or may be part of combined arms formations of various sizes.

The Engineer Battalion organic to the Motorized Rifle and Tank Divisions has a dedicated reconnaissance platoon in the headquarters that is equipped with the BRDM scout car, mine detectors, and diving equipment. The Engineer Company organic to the Motorized Rifle and Tank Regiments has sapper platoons that have reconnaissance as a secondary mission. These platoons may form the nucleus for some of the mission oriented formations discussed below.

There are several mission oriented patrols and detachments whose

³³....., "Tactical Troop Reconnaissance", *How They Fight*, pp. 9-13, July-September 1988.

³⁴Anthony Parr, "Soviet Combat Engineer Support," Garmisch, GE, U.S. Army Institute for Advanced Russian and East European Studies, April 1978, p. 3.

³⁵I.F. Lysukhin, *Inzhenernoye Obespecheniye Forsirovaniya Rek (translation: Engineering Provision of Assault Crossing of Rivers)*, Moscow, Publishing House Voennoye, 1968, (Translated by Foreign Technology Division, Wright-Patterson AFB, Ohio, Report FTD-ID RS)T-1439-82, 21 January 1983), p. 221.

³⁶Kolibernov, p. 29.

responsibilities sometimes overlap. They are characterized by a preponderance of engineer personnel and attachments for specialized missions such as chemical and radiological reconnaissance. The important ones are³⁷:

Engineer Reconnaissance Patrol, IRD (*inzhenernoe razvedyvatel'niy dozor*)

Mobile Obstacle Detachment, POZ (*podvizhnoe otriad zagrazhdenii*)

Movement Support Detachment, OOD (*otriad obespecheniia dvizheniia*)

Reconnaissance/Obstacle Clearing Detachment, ORR (*otriad razvedki i razgrazhdeniia*)

Engineer Reconnaissance group, IRG

Observation Posts, INP

The IRD is generally based on the reconnaissance platoon from the divisional engineer battalion or a sapper platoon from the regimental engineer company. This patrol operates both independently or as the augmentation to other arm's reconnaissance patrols. There is no fixed structure to the IRD, rather the mission and conditions determine its organization. It operates forward of friendly forces and may attempt to penetrate enemy defenses. Occasionally, it may employ raids to capture prisoners, documents, or materiel. Generally, the IRD focuses on detailed study and measurement of roads, bridges, fords, and river crossing sites. Each patrol member has special collection responsibilities with respect to these missions.³⁸

Though organized for the hasty creation of obstacles, the mobile obstacle detachment (POZ) has limited reconnaissance responsibilities. Mainly, it is concerned with determining avenues of approach for enemy counterattacks in its area of operations. Thus its reconnaissance is focused on mobility corridors and obstacle (chiefly minefield) locations.³⁹

During marches, the Movement Support Detachment, (OOD) and Reconnaissance/Obstacle Clearing Detachments, (ORR) reconnoiter the main route of

³⁷Parr, p. 18.

³⁸Kolibernov, pp. 32-33. and Varenyshev, pp. 405-506.

³⁹Joseph Schroedel, "Tactical Mobility: Organizing Engineers for an All-Arms Problem." MMAS Thesis, Command and General Staff College, 1987, p. 16.

advance in conjunction with their bridging and breaching duties. They also mark the route for following forces. The ORR may be subordinate to the OOD.⁴⁰

Engineer Reconnaissance Groups, (IRG) appear to be similar to the IRD in their size and variable organization. The principal difference appears to be that they operate as part of an operational reconnaissance group deep in the enemy defensive zone.⁴¹

The Soviets also employ Engineer Observation Posts (INP) when the forces are in contact. The INP generally has two or three sapper soldiers occupying a foxhole near the front lines. They observe and report engineer activity on a one to two kilometer zone of front. Frequently, they use photography to track the development of enemy field fortifications. If photography is used, the Soviets refer to the observation post as an IPF.⁴²

Combat engineers also augment combined arms reconnaissance. In these employments they perform both specialized reconnaissance and mobility operations. They may join the Independent Reconnaissance Patrol, ORD (*otdel'nyy razvedyvatel'nyy dozor*); the Combat Reconnaissance Patrol, BRD (*boevoy razvedyvateľ'nyy dozor*); or the Reconnaissance Detachment, RO (*razvedyvatel'nyy otryad*), a larger, company-sized force.⁴³

The reconnaissance tasks assigned to engineers vary with the type of operation the supported force is conducting. The next paragraphs discuss their employment in marches and meeting engagements, attacks, river crossings, and defensive operations.

Engineer reconnaissance is decentralized in the march and meeting engagement. Unimpeded movement of combat forces is understood to be the primary mission and on-the-spot decisions may be needed to maintain momentum. To achieve this, the regimental combat reconnaissance patrol (BRD) may contain an engineer patrol (IRD) under its control. Generally, one IRD based on a sapper squad or engineer scout squad reconnoiters each march route. Their chief mission is to

⁴⁰Peter L. Bunce, "Soviet Engineer Equipment." *Engineer*. Vol. 17, No. 1, p. 11, Spring 1987.

⁴¹Kolibernov, p. 31.

⁴²Ibid.

⁴³Allen E. Curtis and Duane C. Young. "Soviet Reconnaissance, Part 2." *Red Thrust Star*, pp. 8-15, September 1989.

determine route conditions, limiting factors, and the amounts of engineer effort and material needed to make the route passable.⁴⁴ The movement support detachment (OOD) reconnoiters for existing or potential bypasses if it cannot overcome obstacles on the route. It generally travels behind the BRD, but ahead of the security element in the march.⁴⁵ Aerial route reconnaissance using helicopters and photography precedes the march if possible. In the meeting engagement, the IRD and OOD reconnoiter and prepare deployment routes for combat forces.

The primary mission of engineer reconnaissance in the attack is to precisely determine enemy engineer measures, obstacles, deep defensive positions, and routes for the attacking forces.⁴⁶ When forces are in contact, the Soviets employ observations posts (INP) to look for location and patterns in the enemy fortification efforts, their obstacles, and the composition of enemy engineers and their equipment. These are generally placed in every two kilometers of front and often employ photography. Soviet engineers also use aerial photos and observation to collect this information.⁴⁷ Patrols aggressively probe enemy defenses prior to an attack. The Soviet engineer may pre-breach minefields one to two days prior to an offensive as part of an IRD's mission. They pay particular attention to wire obstacles because they believe that these may be mined or electrified.⁴⁸ Generally, engineer subunits of the attacking force conduct the reconnaissance, but sometimes engineers from the units in contact may reconnoiter to preclude the enemy from identifying a new unit.

Because successful river crossings from the march depend so heavily on complete terrain intelligence, the Soviets place great emphasis on thorough reconnaissance of rivers. They emphasize the need for accuracy of the data, especially when they plan to deep-ford tanks using snorkeling equipment.⁴⁹ The engineer patrols conducting river reconnaissance also seek enemy information, with the emphasis on enemy location and strength taking more importance with deliberate river crossings. Both the Chief of Engineer Troops and commanders of bridge units

⁴⁴Kolibernov, p. 36.

⁴⁵Parr, p. 38.

⁴⁶Kolibernov, p. 38.

⁴⁷Ibid. pp. 31-38.

⁴⁸Ibid. p. 99.

⁴⁹Lysukhin, p. 118.

dispatch IRDs to river lines well in advance of crossing operations.⁵⁰

Numerous patrols reconnoiter a river on a broad front prior to the crossing. Generally IRDs work independently with one patrol going to each bridge, assault, or ferry site.⁵¹ The IRD may also accompany tactical airborne assaults or forward detachments attempting to seize the crossing sites.⁵² In such operations contact with the enemy during the course of the mission "does not present special difficulties."⁵³

In the defense, Soviet engineers focus on both the terrain and the enemy. In their terrain orientation, they determine protective and camouflage characteristics of the terrain and aid the maneuver force in selecting positions. They ensure the mobility of their force by inspecting roads and bridges in their defensive area and determine the availability of construction materials.⁵⁴ To observe the enemy, two or three INP's observe from each first echelon battalion's sector to look for attack indicators such as increased enemy mobility efforts, new engineer units, new routes, or breaching attempts. In addition to observation, they may employ raids to gain information and capture prisoners, and IRD's actively patrol to determine whether the enemy has breached minefields.⁵⁵

Thus the Soviet Combat Engineer, like his World War II counterpart, is much less a technician than a combat soldier. He has extensive reconnaissance tasks in all types of operations and he is expected to complete his mission behind enemy lines or ahead of advancing maneuver forces. Perhaps most importantly, his reconnaissance aims at providing information for the engineer missions as well as indicators that support the intelligence effort of the overall force.

⁵⁰Kolibernov, p. 36.

⁵¹Parr, pp. 44-45.

⁵²Kolibernov, p. 36.

⁵³Lysukhin, p. 178.

⁵⁴Parr, p. 27.

⁵⁵Kolibernov, pp. 39-40. Also, Parr, p. 28.

Section IV. Overview of Tactical Intelligence

Reconnaissance is a means of collecting intelligence. Like any other battlefield activity, it must be planned to meet the needs of the commander based on his estimate of the situation. Reconnaissance is conducted by various formations based on an intelligence collection plan that is developed by the intelligence officer. Thus reconnaissance is a critical link in the intelligence effort aimed at allowing the commander to see the battlefield.

One of the main ways for the US commander to see the battlefield is through templating.⁵⁶ In the templating process, the intelligence officer hypothesizes the disposition of the enemy based on the known or potential units facing him, their doctrine, and the terrain. He accounts for enemy capabilities, strengths, weaknesses, and preferences. This process is called Intelligence Preparation of the Battlefield (IPB) and one of the results of the process is called the event template. Multiple event templates may be needed to express the intelligence officer's hypotheses. The intelligence cycle attempts to confirm or deny these and allow the intelligence officer to determine which hypothesis reflects the true enemy disposition and intent.

The intelligence cycle is a continuous process that updates and confirms or disproves the Intelligence Officer's hypotheses. To start the cycle, the Intelligence Officer directs the collection of information suggested by his event template. Collectors such as scouts, ground surveillance radars, and military intelligence radio intercept stations collect the required information and report the results back to the intelligence officer. He also queries higher, adjacent or subordinate units for information. The intelligence staff processes the data in a manner similar to assembling a puzzle, and the results of the processing confirm or deny the intelligence officer's hypothesis. The staff provides the results to using units, and the results themselves raise new questions and requirements for new intelligence, thus restarting the whole process.

⁵⁶This discussion of the templating process and intelligence cycle is derived from several sections of chapters 2 and 3 in FM 34-1, *Intelligence and Electronic Warfare Operations*, Washington, D.C., HQ, Department of the Army, June 1987.

The first two steps of the intelligence cycle provide the link between the event template and tactical reconnaissance. Therefore, the following paragraphs look more closely at these steps, particularly at the collection plan.

The event template is the IPB product impacting most heavily on the intelligence collection plan. One feature of the event template is the named area of interest (NAI). An NAI is a location where the analyst expects to see a given event or activity, (or lack thereof) that confirms or denies the enemy's adoption of a certain course of action.⁵⁷ To formulate an NAI, the intelligence officer uses deductive reasoning to determine the probable indicators of enemy intent to adopt a particular course of action. These indicators, their locations, and the ability of the collection means to "look" there are the considerations for establishing NAIs. Thus the NAI focuses the attention and the collection means of the command to confirm or deny the Intelligence Officer's hypothesis.

The collection plan is the intelligence officer's means of tasking reconnaissance, surveillance, and target acquisition (RSTA) assets to look for given indicators in the NAIs. It seeks to optimize the collection effort, while focusing on the most important NAIs. Ideally, it integrates all collection resources, which are tasked according to their capability and suitability for the assigned mission. The Intelligence Officer seeks to balance requirements to achieve high probability of success with economy in tasking collection assets. Redundancy--looking at an NAI with more than one of a given type asset insures coverage. Mix of assets (i.e. using both IMINT and HUMINT collectors) allows more complete coverage.

Reconnaissance is simply one of the means used by the force to acquire the information the intelligence officer has requested. Reconnaissance and surveillance are similar, related activities that sometimes overlap, often using the same assets. Sometimes target acquisition becomes part of reconnaissance and surveillance missions as well. RSTA activities use a combination of HUMINT, IMINT and SIGINT, although a specific collection asset--i.e., an infantry patrol may collect only one category of intelligence data.

⁵⁷Ibid., pp. 3-15.

Reconnaissance at the brigade and battalion levels is generally associated with HUMINT. At these levels, reconnaissance is generally performed by battalion scout platoons, subordinate maneuver forces, supporting military intelligence assets, or attached cavalry units. The next section examines current reconnaissance doctrine in light of terrain intelligence requirements.

Section V. U.S. Reconnaissance Doctrine

The reconnaissance doctrine of the U.S. Army is found in a large number of publications. To focus on the subject of terrain reconnaissance and what the literature calls "engineer reconnaissance," involves a number of combined arms, intelligence, and engineer publications.

Nearly every source lists the need for the commander to see the battlefield and states how he is to do this in various degrees of detail. Since the reconnaissance target often determines the manner to look at it, the following paragraphs examine the terrain intelligence needs of the commander.

Certain items of intelligence comprise the traditional focus of engineer reconnaissance. Our doctrine agrees that information on trafficability and adequacy of road nets is vital, as are details of major obstacles such as river, canals, and streams. The responsibility of both engineer and scout soldiers to provide data on such structures and obstacles is well founded. In the context of a high intensity war with the Warsaw Pact, however, terrain intelligence assumes greater importance.

Merely detecting an obstacle is insufficient to allow complete analysis. Many pieces of data are needed to completely fill out the picture of the enemy obstacle plan. Therefore, data on enemy obstacles must include location, dimensions, type, (including type of mine and patterns for a minefield), enemy coverage, threat strength, and equipment in the area. Extremely detailed information must be recorded for ford sites and rivers prior to mobility operations. Examples are soil type, bottom type, obstacle width, bank slope, and vegetation.⁵⁸

Recently, the concept of Obstacle Intelligence (OBSINTEL) has supplemented terrain intelligence. OBSINTEL, evaluated data concerning enemy emplaced obstacles, has two purposes. The first is to allow engineer commanders to assess the resources required to breach or bypass the obstacle. The second purpose is to allow the intelligence officer to confirm his situation template by comparing it to the numbers, types, and characteristics of obstacles located through reconnaissance.⁵⁹

⁵⁸FM 34-80, *Brigade and Battalion Intelligence and Electronic Warfare Operations*, Washington, D.C., HQ, Department of the Army, April 1986, p. 1-4.

⁵⁹FM 90-17, *Breaching Operations*, Washington, D.C., HQ, Department of the Army, July 1989, p.

Most of the terrain information needed by S-2s, maneuver planners, and engineer commanders can only be obtained by reconnaissance. Now that terrain information requirements are clear, the following discussion turns to the doctrine specifying how such information is to be gathered.

Field Manual 71-1, *Tank and Mechanized Infantry Company Team*; Field Manual 71-2, *The Tank and Mechanized Infantry Battalion Task Force*, and Field Manual 71-3, *Armored and Mechanized Infantry Brigade* contain the combined arms doctrine for company through brigade levels. Neither the 71-1 nor the 71-3 detail reconnaissance doctrine. The company manual, FM 71-1 discusses leader reconnaissance and mentions that the company team may conduct reconnaissance during movement to contact. It mentions little beyond that. The brigade level manual, FM 71-3 merely states circumstances when reconnaissance is necessary, but doesn't comment on who will do it. On the other hand, FM 71-2 gives specific guidance on reconnaissance conducted by the battalion task force.

In the chapter on offensive operations, FM 71-2 states that "all elements of the task force are required to assist in the reconnaissance effort," and that company teams, scouts, ground surveillance radars and "any other element that has a reconnaissance and surveillance capability" receive specific taskings.⁶⁰ It then limits these statements by listing the elements having this capability: scouts, GSR, remote sensor teams, infantry, and tanks. Conversely, in discussions of integrating combat support during movements to contact and deliberate attacks, the FM specifically mentions engineers conducting obstacle reconnaissance.⁶¹

The manual devotes a chapter to more specialized operations which include reconnaissance by engineers. According to doctrine, scout platoons with engineer augmentation reconnoiter prior to hasty water crossings. In the section on obstacle reduction, the manual calls for the infantry and engineer team to reconnoiter the

2-6 and FC 90-13-1, *Combined Arms Counterobstacle Operations: The In-Stride Breach*. Ft. Belvoir, U.S. Army Engineer School, June 1987, p. 2-9. For example, the Soviets use different patterns and techniques in protective and tactical minefields, thus giving each type a distinctive signature. The obstacles thus identified allow analysts to discover the troop disposition. A detailed discussion of Soviet mine doctrine is found in Kolibernov, pp. 61-77.

⁶⁰FM 71-2, *Tank and Mechanized Battalion Task Force*, Washington, D.C., HQ, Department of the Army, November 1988, p. 3-19 and p. 3-21.

⁶¹Ibid. p. 3-47 and p. 3-57.

obstacle while scouts seek a bypass. The appendix on road marching also suggests augmenting scouts with engineers and other combat support elements.

The manual enumerates three principal missions for engineers as it discusses their combat support role. Engineers are "primarily used for hand-emplacing and breaching obstacles, and augmenting the TF reconnaissance effort." It explains that they operate in support of scouts or reconnaissance patrols as opposed to operating independently.⁶²

In summary, FM 71-2's opening discussion fails to note reconnaissance missions it later ascribes to engineers. It generally accepts that engineers must play a role in the unit's reconnaissance effort, but limits their participation to collection supporting mobility or countermobility efforts. Any potential contribution to the overall intelligence effort is not mentioned. FM's 71-1 and 71-3 offer combat engineers no part in reconnaissance.

FM 17-95, *Cavalry Operations* references engineer support far less than the 71-series manuals. Its general discussion notes that the cavalry commander uses "all worthwhile sources"⁶³ to gather intelligence in the attack. Beyond specifying that engineers may be needed to augment scouts reconnoitering a water obstacle, there is no further mention of engineers conducting reconnaissance missions.

FM 17-95 subdivides the cavalry reconnaissance mission into three types: route, area, and zone reconnaissance. The manual notes that cavalry is capable of gathering information on terrain features, trafficability, and obstacles.

Intelligence manuals in the 34-series likewise assign only a limited role to engineers in reconnaissance. FM 34-80, *Brigade and Battalion Intelligence and Electronic Warfare Operations* states plainly,

Intelligence and electronic warfare support, per se is not endemic to the mission of combat engineers. It is limited to the combat information provided by individual soldiers and engineer reconnaissance or terrain data obtained to support their assigned missions.⁶⁴

⁶²Ibid. p. 6-30 and p. 6-31.

⁶³FM 17-95, *Cavalry Operations*, Washington, D.C., HQ, Department of the Army, February 1986, p. 3-18.

⁶⁴FM 34-80, p. 2-15.

The manual notes that engineers are "critical to the brigade IEW [intelligence and electronic warfare] effort in several respects," in a later chapter, but still limits their role to "engineer reconnaissance" without defining the term.⁶⁵

Other intelligence manuals echo this theme. FM 34-1 *Intelligence and Electronic Warfare Operations*, FM 34-10, *Division Intelligence and Electronic Warfare Operations*, and TC 34-50, *Reconnaissance* all maintain a similar orientation. FM 34-1 mentions the need for forward units to provide terrain data and combat information. Significantly, it stresses the commander's need to know the enemy's obstacle plan and how his defense is organized. Overall, the intelligence doctrine views engineer reconnaissance as limited to collecting technical terrain data and passing spot reports.

Doctrine from the engineer community is marked by aging publications dating from the 1960's as well as new thinking on the engineer's intelligence role. The older manuals emphasize technical collection, while newer manuals put the mission in a combined arms setting.

Both FM 5-30, *Engineer Intelligence* (September 1967) and FM 5-36, *Route Reconnaissance and Classification* (January 1970) adhere to a strict definition of engineer reconnaissance: "terrain reconnaissance conducted to support engineer activities."⁶⁶ FM 5-36 states that the engineer must coordinate with the maneuver commander responsible for the area containing the reconnaissance objective. This statement indicates that the route reconnaissance objective may not be linked to the maneuver commander's collection plan--at least so far as this manual is concerned. It also classifies reconnaissance missions as general or specific with general reconnaissance further broken into the subsets of route, area, or zone reconnaissance. FM 5-30 indicates that the division engineer furnishes "generic" information on terrain, obstacles, and enemy activities to the intelligence officer and assists with the intelligence estimate.⁶⁷

⁶⁵*Ibid.*, p. 2-67.

⁶⁶FM 5-36, *Route Reconnaissance*, Washington, D.C., HQ, Department of the Army, January 1970, p. 2-53.

⁶⁷FM 5-30, *Engineer Intelligence*, Washington, D.C., HQ, Department of the Army, September 1967, p. 10.

Doctrine written in the late 1980's suggests that engineer reconnaissance is part of a combined arms effort. Three sources indicate this trend--FM 5-101, *Mobility*; FM 90-17, *Breaching*; and the U.S. Army Engineer School branch lecture at the Command and General Staff Officer's Course in August 1989.

"Reconnaissance is essential to mobility operations" is a main theme of FM 5-101. This manual stresses finding bypasses, estimating breaching effort, analyzing road nets, and performing technical classifications as part of the reconnaissance effort.⁶⁸ It continues by charging the mobility planner to forecast locations where obstacles might affect movement, but stops short of suggesting a link between obstacles and enemy defensive positions.⁶⁹ Curiously, this manual classifies reconnaissance missions differently than either FM 17-95 or FM 5-30. It states that there are two types of reconnaissance--area and specific. It places route reconnaissance as a subset of area reconnaissance, but places road reconnaissance as a subset of specific reconnaissance.⁷⁰ The manual explains that engineers, particularly specialized reconnaissance personnel from engineer battalions will accompany task force scouts to provide both specialized collection and movement support.

The branch lecture and new FM 90-17 both reflect a more assertive role for engineers in tactical reconnaissance. They advocate engineer squads augmenting scout patrols and state a need for specific obstacle data to confirm the intelligence officer's estimate. According to the lecture, specific items of obstacle data should be stated priority intelligence requirements and included in the S-2's collection plan. Then, obstacle data reports go through two channels--to the engineer commander who initiates planning for a breaching mission, and the other to the intelligence officer for confirming his template.⁷¹ FM 90-17 further states that engineer patrols may detach from scout patrols to gather data on obstacles while the scouts probe overwatching enemy positions.⁷² These views are quite divergent from both combined arms and intelligence doctrine concerning the methods of engineer reconnaissance as well as the impact of the collection effort.

⁶⁸FM 5-101, *Mobility*, Washington, D.C., HQ, Department of the Army, November 1985, p. 3-3.

⁶⁹*Ibid.*, p. 5-5.

⁷⁰*Ibid.*, p. 7-5.

⁷¹U.S. Army Engineer School Lecture to CGSOC students, Ft. Leavenworth, 3 August 1989.

⁷²FM 90-17, p. 2-7.

The final source of doctrine to consider is the Table of Organization and Equipment (TOE) for the divisional engineer battalion. TOE 5-147L fails to mention any reconnaissance mission or capabilities assigned the engineer battalion. There is no reconnaissance section in the headquarters company of the battalion. Likewise, the TOEs organizing the battalion's subordinate units make no mention of reconnaissance capabilities. The Combat Engineer Company, however, has the capability of performing unspecified infantry combat missions when required.⁷³

To summarize, reconnaissance doctrine from different sources is divergent in several areas. The amount of emphasis placed on the engineer's role in reconnaissance is only one major point. There are also major differences in the view on engineer participation and on the classification of reconnaissance tasks. Finally, the impact of the information gathered appears to be a subject for debate. Combined arms and intelligence manuals imply that it is merely for engineer mission planning, while other doctrine describes its impact on the entire intelligence effort.

⁷³Tables of Organization and Equipment 5-145L, 5-146L, 5-147L, and 5-148L.

Section VI. Collective Training of Scouts and Engineers

The collective tasks for which a unit trains are described in Army Training and Evaluation Program Manuals (ARTEP Manuals). These include the conditions and standards under which the task must be performed. This section compares the collective training of scout platoons and engineer squads using manuals applying to the Scout Platoon (ARTEP 17-57-10 MTP) and Engineer Battalion (ARTEP 5-145, which includes engineer squads and platoons).

Scout platoon training entails a large number of collective tasks that vary widely in scope. The training manual classifies reconnaissance tasks as route, zone, area, and obstacle reconnaissance missions. The evaluation standards for these missions focus on locating enemy, ford sites, bridges, and determining trafficability of the reconnaissance objective. The scout platoon is expected to evaluate terrain features with the same accuracy as engineers. On the other hand, their mission to reconnoiter an enemy obstacle only expects them to determine if it is mined and whether they can breach it using platoon assets. No data gathering on orientation, type, dimensions, or pattern (if a minefield) is expected.⁷⁴

The reconnaissance and patrolling training prescribed for engineer squads is similar to that of the scout platoon. The doctrine states that engineers conduct both mounted and dismounted tactical movement, patrol with likely enemy contact, submit spot reports, and perform route reconnaissance missions. The task listing prescribes other reconnaissance missions whose title describes the objective: bridge, river, crossing site, assault bridge crossing site, and enemy minefield. Area and zone reconnaissance are not included in the task list of ARTEP 5-145, although it lists "catch all" task--"Conduct Special Reconnaissance." The evaluation outlines for these tasks focus on collecting terrain data rather than on locating enemy forces. These evaluation outlines do not mention enemy forces, however, since conditions of some missions are specified as behind the FEBA, this implies that other missions may occur forward of the FEBA.⁷⁵

⁷⁴FM 17-57-10 MTP, *Scout Platoon*, Washington, D.C., HQ, Department of the Army, September 1988, pp. 5-63 to 5-79.

⁷⁵ARTEP 5-145, *Army Training and Evaluation Program, Engineer Battalion, Mechanized and Armored Divisions*, Washington, D.C., HQ, Department of the Army, December 1980, pp. 3-48 to

The comparative focus of these training documents is reflected by the units for which they are written. The scout manual emphasizes security, stealth, and locating the enemy. The engineer manual, on the other hand, almost ignores the enemy and focuses on gathering accurate data. Neither manual addresses what FM 90-17 calls OBSINTEL--orientation, type, dimensions, and signature of enemy obstacles. In all, after considering the implied tasks as well as other doctrinal material listed in the evaluation outlines, the reconnaissance missions expected of scouts and engineers are very similar.

Section VII. Observations of Current Practice

This section uses observations and reports to assess the effectiveness of reconnaissance in current heavy force operations. Principal sources include the Center for Army Lessons Learned (CALL), a RAND Corporation study, and observations from a former NTC observer/controller.

The correlation between reconnaissance success and mission success has become a hallmark of NTC operations. An early CALL Lessons Learned Bulletin⁷⁶ stated, "prior to offensive operations, the most important intelligence that the task force commander needs is the location of enemy obstacles and the disposition of enemy forces." CALL later quantified this observation. First, it defined reconnaissance success as reporting enemy positions and obstacles with sufficient depth to confirm the S-2's IPB by one hour prior to the attack. CALL noted that of units which meet this standard, 83% win; of those who don't, 90% lose.⁷⁷ This clearly shows the critical link between a confirmed template and battlefield success.

However, most observations indicate that U.S. tactical units fail to acquire adequate intelligence to confirm their enemy template prior to offensive operations. Referring to "continuing failures of the BLUEFOR intelligence system," the RAND study quoted one observer: "A frequent and major problem is a lack of reconnaissance prior to the attack, to find out enemy dispositions and particularly the location and extent of obstacles."⁷⁸ In only 60% of 72 battles cited in this study did reconnaissance confirm enemy defensive positions. Thus in 40% of the battles, the attacker was blind--his enemy template was only an unconfirmed hypothesis. These units also experienced difficulty in finding enemy obstacle systems. Obstacles on or near the objective were confirmed with 44% success. Away from the objective area, the failure became more acute: Success at locating obstacles on the axis of advance

⁷⁶Center for Army Lessons Learned, *NTC Lessons Learned*, Ft. Leavenworth, CALL, 31 January 1986, p. 3.

⁷⁷Center for Army Lessons Learned, *CALL Compendium. Volume 1: Heavy Forces*, Ft. Leavenworth, CALL, Fall 1988, p. 4.

⁷⁸Martin Goldsmith with James Hodge, *Applying the National Training Center Experience: Tactical Reconnaissance*, Santa Monica, The RAND Corporation, 1987, p. 2.

was 26%, and reporting trafficability was 9%. Clearly, the reconnaissance system used by rotational units at the NTC often fails to produce adequate intelligence.

Even after such experiences, there is little evidence that units use all their resources to template and find obstacles. Often, task force engineers don't participate in the IPB process,⁷⁹ and intelligence officers fail to query the higher headquarters for terrain and obstacle intelligence that is available.⁸⁰ At higher levels, minefields and obstacle-free areas are not designated priority intelligence requirements in spite of their potential intelligence value.⁸¹ Thus units place insufficient priority on obstacle intelligence in their collection planning.

While obstacle intelligence can reveal enemy dispositions, most units relate it only to engineer missions. The U.S. Army Engineer School found that in a sample of 40 NTC battles, 60% of the attackers did not template obstacles as part of the IPB.⁸² Even though obstacle orientation, type, and characteristics often clearly depict the enemy defense, most scouts report only location and type.⁸³ These studies indicate that collecting effective obstacle intelligence is not a maneuver force priority.

Many missions typically performed by scouts and combined arms patrols could be performed by combat engineers. Martin Goldsmith and James Hodge tabulated observations of various subunits performing engineer-related missions forward of the FLOT prior to attacks. Engineer soldiers located objective obstacles in only 8 of 141 cases. The second mission, locating obstacles enroute to the objective was done by engineers in 5 of 98 missions. Two missions, terrain reconnaissance and trafficability analysis are engineer specialties, yet the units used scout platoons or infantry patrols exclusively.⁸⁴ The observations also indicated that missions assigned reconnaissance elements were overwhelmingly enemy oriented.⁸⁵

⁷⁹Bryan G. Watson and Hardy Swinson, *Engineers in the Offense: A Question of Integration*, Unpublished manuscript, 1989, p. 1.

⁸⁰Bryan G. Watson, Interview at Ft. Leavenworth, 17 October 1989. Captain Watson was an observer/controller at the NTC from 1986 to 1989.

⁸¹William H. Janes, Letter to AMSP Students, Subject: Division/Corps Exercises, 15 September 1989.

⁸²Engineer School Lecture.

⁸³Watson, Interview.

⁸⁴Goldsmith and Hodge, p. 109.

⁸⁵Watson, interview.

Current reconnaissance techniques fail to provide adequate information for task forces to breach obstacles with a high probability of success.

In almost every attack at the NTC, BLUFOR units are surprised by an unexpected obstacle. Stalled in an OPFOR killsac, [sic] the BLUEFOR TF is systematically destroyed by the combination of enemy direct and indirect fire. In almost every attack lost by BLUFOR units, the TF found the enemy's tanks, but was destroyed short of the objective by the synergistic effects of obstacle and massed enemy fires.⁸⁶

This states plainly why obstacles deserve the attention of the maneuver commander and his staff.

Obstacle templating and careful reconnaissance improve the chances of successful obstacle breaching. The Engineer School's study of 40 battles found that 24 attackers (60%) had no knowledge of obstacles, 16 (40%) had at least templated obstacle locations, and 8 (20%) had located them by reconnaissance. Of the forces that had no knowledge, only one was able to breach the obstacle (4%). Only 8 of the 16 that templated obstacles were successful (50%), while 6 of 8 having reconnaissance data breached successfully (75%). In general, the casualties and disruption caused by the breaching operation were decreased with increasing obstacle intelligence.⁸⁷ While the number of battles in this analysis is small and is limited to a certain time period, the trend is clear: Good obstacle intelligence increases the chance of success in breaching.

Obstacle intelligence is clearly needed by the battalions and brigades in the attack, but can units task the scouts with another collection mission? The prevailing opinion in journal articles and exercise observations is that scouts already have too many missions and many authors propose augmenting scouts with other forces to alleviate this problem. Some have even suggested reorganizing scout platoons to provide air defense, engineer, or military intelligence assets.⁸⁸ Goldsmith and Hodge state the need for augmentation quantitatively: Of units which augment their scout

⁸⁶Watson and Hardy, p. 2.

⁸⁷Engineer School Lecture. In this discussion, success criteria is breaching the obstacle in 30 minutes or less.

⁸⁸See bibliography for some representative journal articles. Also, see CALL lessons learned database.

platoons with other assets, 50% win, but of those that do not, 60% lose.⁸⁹

Augmenting reconnaissance platoons with engineer squads is gaining favor with maneuver commanders. The CALL database provides sixteen recent observations where only four units reported placed engineers with their scouts, but another five stated that, in hindsight, they should have. Other comments from the database divulged numerous examples of engineers augmenting reconnaissance efforts. Only two comments advised against the idea, suggesting that engineers compromise stealth and that engineer units provide badly trained individuals to the scout platoon.

In summary, these observations indicate that U.S. Army units at the tactical level have difficulty completing their picture of the battlefield. The results establish that a complete picture is absolutely necessary for their success in offensive operations. In general, their organic reconnaissance assets are too few to complete their tasks, and these assets generally focus exclusively on locating enemy positions, thus excluding some other potentially valuable types of data. Augmenting scouts with combat support assets is one way to overcome this problem, and units have experimented with various augmentation schemes, including using combat engineers.

⁸⁹Goldsmith and Hodge, p. 5.

Section VIII. Analysis

Can the commander expect combat engineers to successfully enhance his view of the battlefield? Several factors affect the answer to this question: assets, experience, doctrine, and security.

Tactical commanders lack the assets to gather all the intelligence they need. Brigade commanders have no organic reconnaissance assets. The battalion's six vehicle scout platoon is almost always overtasked. Often, it lacks the time to conduct detailed reconnaissance, and the loss of only one or two vehicles drastically cuts its capabilities. Additionally, scouts may not be well practiced in techniques for reconnoitering bridges or analyzing terrain. Thus organic assets often leave gaps in the intelligence picture.

Experience indicates that other armies have successfully integrated engineers into intelligence collection schemes. Today the Soviet Army uses specialized engineer patrols to conduct reconnaissance and integrates their use at all levels. They train combat engineers for movement into the depths of enemy defenses as well as for specialized reconnaissance in support of combined arms patrols. The Wehrmacht routinely employed engineer officers for reconnaissance. There is no comparable doctrine for the U. S. Army.

Drawing lessons from other armies, some battalions have augmented their scouts with engineer squads or platoons during NTC rotations with promising results. If the battalion has sufficient supporting engineers, experience indicates their mission is better served by gathering data on obstacles prior to the battle, rather than in breaching obstacles under fire without prior intelligence.

U.S. Army doctrine is inconsistent about the reconnaissance role of engineers. Combined arms doctrine, while giving reconnaissance the emphasis that recent experience dictates, maintains that reconnaissance by engineers is limited to data for their own use. Our doctrine never considers combat engineers undertaking independent patrols for data that is of value to the force as a whole. Intelligence doctrine states in one place that engineers are only capable of giving spot reports, while in the same manual addresses their valuable contributions to the collection effort.

Finally, doctrine from the engineer community is likewise split. Emerging doctrine from the engineer school heavily promotes force reconnaissance as opposed to limited, specialized collection outlined by 1960's doctrine.

Security is one major consideration of assigning missions forward of the FLOT to combat engineers. Engineer vehicles present unique signatures thus drawing the enemy's attention. Whether mounted or dismounted, engineer patrols can maintain security only by frequent training in movement and patrolling techniques. Such techniques are assigned them by doctrine, but often take second priority to technical training. Security thus argues against independent employment of combat engineers.

Would today's assets, doctrine, or experience overcome the problems that faced the 112th Infantry in the Kall Gorge? A modern brigade facing the same mission today would know that it needs both enemy and terrain intelligence. Scout platoons from the subordinate battalions, though proficient, would be overworked trying to implement their S-2's busy collection plans and would focus on locating the enemy. Supporting engineers would expect mobility problems in the Kall Gorge, but without knowing the actual conditions could not plan or rehearse their mission. Tasking an engineer platoon to reconnoiter the trail through the gorge would never occur to the brigade or battalion commanders because our combined arms doctrine never hints at the idea. Simply put, today's U.S. Army would suffer the same fate as the 112th Infantry Regiment of 1944.

Section IX. Conclusions And Recommendations

This section outlines several conclusions drawn from the analysis of doctrine, historical evidence, and current practice. After outlining these, the monograph offers specific recommendations to correct deficiencies and increase our reconnaissance capability.

Combined arms doctrine has four major shortcomings. First, it generally fails to place enough emphasis on reconnaissance in general, and on terrain and obstacle reconnaissance in particular. Secondly, obstacle breaching is treated as a contingency operation in spite of evidence indicating that breaching is required in nearly every attack, and that complete obstacle intelligence greatly increases the chance of success. Thus, NTC experience is not reflected in combined arms doctrine. The other two doctrinal shortcomings are directly related to reconnaissance missions.

Reconnaissance missions are not consistently defined in all publications. There can be only one type of route reconnaissance, for example. The classifications of missions in the cavalry and engineer manuals are inconsistent. The other doctrinal shortcoming is related to this one. Standards for these missions from different ARTEP manuals (namely ARTEP's 5-145 and 17-50-10) are inconsistent.

Intelligence doctrine generally fails to account for the systematic and methodical nature of Soviet defensive preparations. It does not seek to exploit the patterns of enemy engineer effort and obstacles to determine how enemy forces are positioned and to locate kill zones.

The following recommendations will help remedy some of these shortcomings.

To provide the commander with additional eyes to see the battlefield, the reconnaissance role of combat engineers should be expanded in doctrine and training. Engineers need to be trained and utilized both as scout platoon augmentation and independent reconnaissance patrols. Then, tactical commanders need to tap their intelligence collection ability. Only FM 90-17 and ARTEP 5-145 suggest independent operations for combat engineers forward of the FLOT--other doctrine relegates

engineers to technical reconnaissance behind friendly protection. All publications should be revised to reflect the expanded role suggested by FM 90-17.

The criticality of breaching missions demands that these operations receive more doctrinal emphasis. Rather than a brief mention in the rear chapters of FM 71-2, breaching should be integrated in the chapter on offensive operations.

Definitions of reconnaissance missions should be clarified and standardized between different manuals. The current disjoints between FM's 17-95, 5-30, and 5-100 concerning the classification of reconnaissance missions and their objectives deserve attention. In a similar vein, manuals describing the training standards for reconnaissance missions need to be standardized. In particular, the engineer manuals need to include enemy forces as reconnaissance objectives and emphasize security during the patrol. Reconnaissance missions need to have common language and standards no matter what type of force conducts them.

The intelligence community should capitalize on the methodical nature of the Soviet Army's defense. In this regard, the term OBSINTEL should be added to our doctrine to describe intelligence regarding type, orientation, and patterns of enemy obstacles. On the other hand, the term "Engineer Intelligence" should be dropped. This label implies that there is only one user of the intelligence involved when this is not the case.

Training to implement this doctrine must appreciate threat obstacle systems and foster cooperation between the arms. Cavalry scouts and combat engineers must learn Soviet mines and minefield patterns. This information should be published in our training literature. Scouts and engineers routinely need to train as a team, and the combat engineers should also practice patrolling independently. Engineer leaders should adapt a Soviet expedient from World War II, and designate one platoon per company as the reconnaissance platoon and train it extensively as such.

No changes in force structure are needed to implement the doctrinal changes outlined above. Some changes would enhance the engineer's capability, however. Since reconnaissance of water obstacles is a recognized engineer mission, diving equipment and current velocity meters should be added to the TOE of the combat

engineer battalion. The engineer battalion needs a specialized reconnaissance capability, so the reconnaissance section should be reinstated in the battalion's structure. Under the upcoming E-Force structure, this will give each brigade a dedicated and specialized reconnaissance section.

This monograph does not pretend to solve all the reconnaissance challenges facing the U.S. Army, but it does propose that combat engineer soldiers can assist with this vital mission. The changes outlined in doctrine and training are minimal, and the proposed doctrinal changes merely shift the emphasis of the collection effort to provide the tactical commander with a new tool for his use based on his assessment of the situation.

Armed with this new emphasis, the "Greene Hornets"--and their accompanying engineers, would have walked the Kall Gorge, and the 112th Infantry would have held the village of Schmidt.

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