KILLER OF COMMUNISTS, SAVER OF SOLDIERS:
U.S. ARMY FIELD ARTILLERY IN THE KOREAN WAR,
1950-1953

A Thesis
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by
Ronald K. Kyle, Jr., B.A.

* * * * *
The Ohio State University
1995

Master’s Examination Committee:
Allan R. Millett
Williamson Murray
Katharine Swett

Approved by

Adviser
Department of History
To Stephanie,
who has spent more time alone than a bride should while I completed this project.
VITA

May 3, 1963 .................................. Born - San Antonio, Texas

1985 .............................................. B.A., Western Maryland College,
Westminster, Maryland

1985-Present ................................. U.S. Military Officer

PUBLICATIONS

“Grant, Meade, and Clausewitz: The Application of War as an Extension of Policy
During the Vicksburg and Gettysburg Campaigns.” *Army History* (Fall 1993).

FIELDS OF STUDY

Major Field: History
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INTRODUCTION

ARTILLERY SUPPORT IN LIMITED WAR

Contrary to popular belief, America's limited wars in the contemporary era were not the first in which political considerations played a paramount role. Modern military and civilian technology has, nevertheless, brought significant changes to the ways the United States conducts modern war. Obvious examples of such technology include instantaneous media, sophisticated aircraft, and, of course, nuclear weapons. The proper employment of these technologies can enhance America's military and political position. The improper use of such technology or the failure to control the outcomes such technology makes possible can hinder the country's military and political position.

A less obvious example is the country's use of its field artillery.¹ Properly employed, artillery has been an effective way to provide fire power with the minimum of manpower as well as an effective means to kill large numbers of an enemy with minimum loss to one's own forces. By minimizing American losses the government can more easily gain or maintain popular support for a war, or at least help lessen a war's unpopularity. Improperly employed, artillery can be a liability. In Vietnam,

for example, the careless use of artillery to conduct harassment and interdiction fires helped turn South Vietnamese civilians against the United States.\textsuperscript{2} Such short-sighted use of artillery to gain an immediate military benefit without regard for political consequences affected the outcome of the entire war. The mere presence of such weapons can in itself be considered offensive and may invite enemy action against those weapons, creating a situation ripe for escalation.

During the Korean War (1950-1953), America's first limited war in the contemporary era, the United States generally employed its artillery in an effective manner. With its artillery it effectively overcame with firepower the far larger manpower advantage enjoyed by Chinese and North Korean forces. The United States consciously relied on the artillery to keep American casualties to a minimum during the war's last two years when complete victory no longer seemed possible. Although the Korea War rarely had great public support, even much of that support would have eroded had the artillery had not succeeded in limiting American casualties. The artillery also allowed the U.S. to minimize the number of combat troops in Korea, thereby assisting the military to maintain its focus on the most significant threat to American interests—a Soviet invasion of Western Europe. The war's last two years are rightly called "the artillerymen's war."

This thesis is a study of key aspects in the employment of the U.S. Army's field artillery in the Korean War. The U.S. Army conducted similar studies after the war as part of its lessons learned process. Many historians have also written about the

artillery in broader histories of the war. The former are technical and sometimes tedious, as they were written for a military audience. They also do not, by their nature, examine the past as much as they use the past to plan future directions. The latter tend to focus on artillery weapons and ammunition. They rarely deal with other more mundane aspects of the artillery war, such the development of the Fire Support Coordination Center or the employment of the field artillery observation battalion during the war. The primary focus of this thesis is to evaluate the field artillery’s effectiveness during the Korean War by examining three key organizations within the field artillery: the field artillery battalion, the field artillery observation battalion, and the fire support coordination center. My secondary focus precedes the first, as I intend to assess the artillery’s ability to learn from its World War Two experiences and to translate those experiences into workable military doctrine. Both are related inasmuch the field artillery’s performance in the Korean War tell something about the effectiveness with which the artillery used the postwar years (1945-1950) to improve its strengths and correct its deficiencies.

The Korean Peninsula

Korea is located on a peninsula between China, Russia, and Japan, and for centuries has been the natural route for these powers to attack each other, earning it the nickname the Belgium of the Far East. The Yalu and Tumen Rivers form the peninsula’s natural northern boundary as well as an 850 mile political boundary between North Korea and China and an eleven mile political boundary with the Soviet
Union in the northeast corner. The Korean peninsula extends out from Manchuria in a generally southerly direction for about six hundred miles, coming to within 120 miles of southern Japan. To Korea’s west is the Yellow Sea; to its east is the Sea of Japan or (as the Koreans prefer) the East Sea.

Korea’s single most-distinguishing geographical feature is its mountains. The Korean peninsula consists of some of the steepest and most densely mountainous terrain in the world, particularly in the north. The Taebak mountain range, which runs the length of the peninsula, rises to its greatest heights in the north, virtually dividing North Korea into an east and west. Only about 15% of Korea is lowlands. Most of this is in the south, but even in the south the plains are generally small and isolated from each other. Though cross country movement is difficult throughout most of the peninsula, a conventional military advance north or south is especially difficult in the North.\(^3\)

Mountains significantly affect military operations, especially when there is no way around them. Mountains tend to impose limits on troop size and movement and aggravate logistical difficulties. The lack of adequate road nets common to these areas increases the value of those that actually exist. Operations, even when centrally planned, tend to be decentralized in execution and small unit actions are common. Observation is more difficult as the mountains create blind spots, some of which are large enough to hide an entire valley from view. Many artillery missions have to be

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fired using a high trajectory to clear mountains near the battery position or near the
target, which has an adverse affect not only on accuracy but also on the ability to
mass fires effectively. Mountainous terrain in Italy, for example, significantly af-
fected field artillery operations. A portion of the 1949 Field Service Regulations
which discussed operations in mountains reflected this experience in a small way.
The reality, unfortunately, was that the Army of the late 1940s focused on northwest
Europe and the threat posed by a possible Soviet invasion of this area. It did not,
therefore, develop weapons nor practice doctrine with mountainous terrain in mind.
During the Korean War many of the lessons the artillery learned about how to operate
in mountainous terrain in Italy needed to be relearned in Korea.\footnote{Lessons From the Italian Campaign 9 September 1943-1 February 1944,” (10 March 1944), 73; Robert A. Doughty, The Evolution of US Army Tactical Doctrine, Leavenworth Papers Number 1, Combat Studies Institute (Fort Leavenworth, KS: US Army Command and General Staff College, August 1976), 2-3, 7.}

Although mountains are the most militarily significant terrain in Korea, a
number of militarily significant rivers flow in the peninsula, particularly in the west-
ern lowlands. The most important rivers in North Korea are the Chongchon and
Taedong Rivers, both of which are completely within North Korea, and the Yalu and
Tumen Rivers which comprise most of North Korea’s border with the People’s Re-
public of China and the Soviet Union, respectively. The most important rivers in
South Korea are the Imjin, Han, Pukhan, Kum, Sogang and Naktong Rivers. These
rivers form a vital part of the Korea’s rice farming, and in the summer the rivers and

the rice paddies irrigated by these rivers significantly impede a mechanized army's movement. Much of the area around the rivers is lowland, and during the summer monsoons these areas, often the only suitable battery positions, are susceptible to flashflooding. Many artillery units in the Korean War were caught in such areas until experienced officers learned their characteristics and avoided them.

In addition to the July-August monsoons, the Korean weather is distinguished by hot, humid summers and cold, damp winters. This combination made life uncomfortable for the front line soldier. The winters brought one significant advantage: the rice paddies usually froze, giving more freedom of movement to a mechanized army. It still brought misery to the foot soldier. The winter of 1950-1951 during the U.N. retreat from high in the mountains of North Korea was particularly difficult. Few buildings existed in which soldiers could seek shelter. Summer brought fresh discomforts. Many soldiers long remembered the stench caused by Korean farmers' use of organic fertilizer for their rice paddies. Little suitable water existed, and the military had to ship in potable water or first treat the water available in the country. The combination of weather and terrain was hard and men and machines alike.

Although Korea had been generally spared destruction during the Second World War, the Korean transportation system was primitive by western standards, and was hardly suited to support a modern army. As was characteristic of most mountainous areas outside Europe, the road net was poor. Only 20,000 miles of vehicular road existed, none of which were better than a secondary road. The rail network fared slightly better, and there was even one good railroad extending north from Pusan, the
most significant port on the peninsula, to the Seoul-Inchon area. Like the other railroads that existed in Korea, however, it ran generally north-south with few lateral routes. There were only a limited number of airstrips, and the various ports in Korea could not handle large amounts of equipment. No quick way existed, therefore, to bring in supplies from the outside. All in all, Korea was not the best place to fight a modern war.⁶

Twentieth century events had not been kind to Korea. Japan annexed Korea in 1910. In the 1930s Japan used Korea as a starting point for its invasions of China. Allied victory in World War Two brought Japanese occupation to an end, and in 1945 United States divided Korea at the 38th Parallel to facilitate the surrender of the Japanese soldiers occupying Korea to American and Soviet forces. The United States established the boundary only as a temporary military expedient, but Korea became one of the first casualties of the rising tensions between the United States and the Soviet Union, transforming the temporary demarcation line into a permanent political boundary. North Korea became a Communist state and fell into Moscow’s orbit. South Korea looked to the West, particularly the United States, for help.

The Korean War

North Korea completely surprised the United States when it crossed the 38th Parallel to invade South Korea on June 25, 1950. Although tensions existed on the

Korean peninsula since its division in 1945, no American intelligence agency predicted that in 1950 North Korea would launch a conventional invasion. President Harry S. Truman, believing this to be the first of possibly several Moscow-directed Communist advances, committed U.S. ground forces to South Korea under the auspices of the United Nations. These first units, deployed from occupation duties in Japan, were under-prepared for war and slowed, but did not stop, the North Korean’s advance down the peninsula. By August, 1950, the North Koreans boxed United Nations forces into a 50 by 75 mile rectangle in the southeast corner of South Korea. Fortunately for the United Nations, Pusan was located within their area, and UN forces unloaded military supplies as quickly as possible in a desperate bid to keep the North Koreans from pushing them into the sea.

General of the Army Douglas MacArthur, whom Truman had appointed in July 1950 to command the UN forces in Korea, developed a bold plan to reverse the bleak military situation. He intended to land forces at the South Korean port city of Inchon, well-behind North Korean lines. Once landed they would drive east to Seoul, South Korea’s capital city, and from there further east across the peninsula, cutting off the North Korean troops surrounding Pusan. He intended to trap the enemy between an anvil (the assaulting forces) and a hammer (the forces already on the peninsula). The Inchon landing proved one of the great successes in American military history, and UN forces quickly liberated all South Korea. In October, 1950, the United States invaded North Korea to settle “the Korean question” once and for all.
Victory for the United Nations seemed imminent when Communist China, having warned the world of its intentions if North Korea were invaded, joined the war on the side of North Korea. The Chinese inflicted severe defeats on UN forces, who again began a long retreat. By February 1951, UN forces finally stabilized the lines south of the original boundary following their successes in the battles around Chip-yong-ni and Wonju. By mid-summer 1951, the lines stabilized around the 38th Parallel. When the armistice talks began between the belligerents, many Americans thought the conflict would soon be over. As it turned out, however, this was only the first of three long years of war.

The war’s first year, which from a military standpoint also can be considered the first of the war’s two phases, began from the initial North Korea invasion in June 1950 and ended when the lines stabilized in July 1951. Sweeping movements by both sides up and down the Korean peninsula characterized this first phase, and the American military experience during this period is often compared to the American military experience in the Second World War. Though adequate, this comparison is superficial because sweeping movements were not often a part of the American experience in World War II. A more complex, though more meaningful, comparison would be one which characterized the first phase as a combination of the broad sweeps that occurred in France and Germany over terrain similar to that in Italy against an enemy similar

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7 See, for example, the Eighth Army Artillery Officer's "A Study of the Employment and Effectiveness of the Artillery During the Period October 1951-July 1953" (16 January 1954), xi. (Hereafter cited as "A Study of the Employment and Effectiveness of Artillery.")
to the Japanese. Artillery during this time performed its mission much as it had in World War II. It followed behind the infantry and provided fire support on call. This phase ended in July 1951 with the successful UN counterattack that restored the front line near the 38th Parallel.

The second phase of the war began in July 1951 and continued to the armistice in July 1953. This phase is often compared to the trench warfare which prevailed on the Western Front in World War I. Much of this phase was characterized by what seemed to the soldiers involved to be an endless struggle for the next hill. The infantry came to expect a great deal of artillery support on both offense and defense, and the artillery soon played a much different role than it had during the war’s first phase or even in much of World War II. The impetus behind this change was two-fold. First, the relatively stringent troop ceilings made it desirable to provide maximum firepower with a minimum of manpower. Man for man, artillery units provided more firepower than any other army unit. Second, the strong emphasis on curbing American casualties led to the increased use of fire power. As General Ridgway stated in a message to the Joint Chiefs of Staff:

Whatever may have been the impression of our operations in Korea to date, artillery has been and remains the great killer of Communists. It remains the great saver of soldiers, American and Allied. There is a direct relation between the piles of shells in the ammunition supply points and the piles of

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corpses in the graves registration collecting points. The bigger the former, the smaller the latter and vice versa.\(^9\)

General Ridgway, a soldier's general, also said the same thing in a way his soldiers understood and probably found heartening when he stated that "Steel is cheaper than lives and much easier to obtain."\(^{10}\)

The artillery performed better during the war's last two years than it had during its first. As with most combat units artillery found it easier to defend than to attack. This stabilized period, however, proved especially suitable for artillery. A stable front line allowed for extensive survey support, making fires more accurate. It allowed forward observers to become familiar with the sector in front of them. It allowed for detailed planning, the establishment of a redundant communications system, and so on. Since artillery doctrine, according to the testimony of many officers and observers, was basically sound,\(^{11}\) the field artillery was able to use to good advantage the situation it faced in the last two years of the war.

The war ended on July 27, 1953, when leaders of the UN and Communist Forces signed the armistice. Although all branches of the Army performed well after the initial stages of the Korean War, the artillery's importance should not be


\(^{10}\)Carl W. Schaad, "Fire Support Coordination," *Combat Forces Journal* 3 (September 1952), 40.

\(^{11}\)See, for example, Edward Almond, "Conference on Battle Employment of Artillery in Korea," address given at the Artillery Center, Fort Sill, OK (11 February 1952), 8; Office, Chief of Army Field Forces, "Report of Army Field Forces Observer Team Number 6," (7 May 1952), 3, Tab F, 1; and "Special Problems in the Korean Conflict," 54.
underestimated. At the war’s end, Far East Commander General Maxwell D. Taylor stated that “the casualties inflicted on the enemy by the artillery far exceeded those produced by other means.”\textsuperscript{12} Perhaps even more importantly, the UN soldiers protected from becoming casualties by artillery far exceeded those saved by other means. In a politically charged war, facing an enemy who politically could afford greater losses than could the US, this accomplishment was neither easy nor unimportant. Without the field artillery’s tactical and operational successes the war would almost certainly have followed a different course, and it is unlikely that the war’s outcome would have been as favorable to American political interests and goals as the actual outcome. What General Patton said about the artillery in World War Two applied to a much greater degree in Korea: “I don’t have to tell you who won the war. You know the artillery did.”\textsuperscript{13}

\textsuperscript{12} A Study of the Employment and Effectiveness of Artillery”, vii.

\textsuperscript{13} Quete in Snow Hall, The Field Artillery School, Fort Sill, Oklahoma.
CHAPTER I

THE FIELD ARTILLERY BATTALION

The basic unit of the U.S. army field artillery was the field artillery battalion (FAB). It consisted of five batteries: the [battalion] Headquarters Battery; the Service Battery; and three howitzer batteries (A, B, and C). The Headquarters Battery contained several sections, including the fire direction center (FDC), the communications (commo) platoon, and the survey section. The Service battery consisted of the battalion service platoon (maintenance and supply) and the battalion ammunition trains. The three firing batteries contained six howitzer sections,\(^1\) three forward observers, and a miscellaneous number of radio men, scouts and maintenance soldiers.\(^2\)

There were two types of FABs: divisional and non-divisional battalions. Divisional battalions were those units organic to an army division.\(^3\) Each division in Korea had four battalions organic to it. One battalion was assigned to support each of the division’s three regiments. These three battalions were the division’s direct

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\(^1\)This varied from type of unit. Almost all batteries in Korea, however, had six guns.


\(^3\)Again, this could vary from one division to another depending on type. All the divisions in Korea had an infantry type organization.
support battalions, and in the infantry divisions in Korea were comprised of eighteen 105mm towed howitzers. Division artillery commanders tried to maintain some type of habitual association between an specific infantry regiment and a specific field artillery battalion, especially as infantry units received their forward observers from whichever artillery unit provided its direct support. The division commander allocated the fourth divisional battalion, the general support battalion, as he saw fit. The general support battalion normally consisted of eighteen 155mm towed howitzers.

These four battalions constituted the division artillery, or divarty, and were controlled by the division artillery headquarters. During the war, 27 battalions of 105mm towed howitzers served in a direct support role and eight battalions of 155mm towed howitzers served in a general support role.\textsuperscript{4}

The balance of the 54 field artillery battalions assigned to Korea\textsuperscript{5} served as non-divisional units, and were assigned to various corps artillery headquarters or to the field artillery group. All non-divisional FABs consisted of self-propelled weapons which ranged in caliber from the 155mm howitzer and 155mm gun to the 240mm battalions formed in March 1953. Like their divisional counterparts, the 155mm howitzer battalions consisted of eighteen howitzers. The 155mm gun battalions consisted of only twelve guns, and the 8" and 240mm battalions consisted of only six.

\textsuperscript{4}Summers, \textit{Korean War Almanac}, 113. A total of eight different U.S. divisions served in Korea though no more than six at any time. Therefore 24 of the 105mm towed battalions performed direct support to these eight divisions. The remaining three performed direct support to the three regimental combat teams which were also in Korea. The eight 155mm towed performed general support to the eight divisions which were assigned to Korea.

\textsuperscript{5}Summers, \textit{Korean War Almanac}, 113.
guns each. Initially none of the three corps (I, IX, and X) deployed to Korea had corps artillery headquarters. The 5th Field Artillery Group—the only group deployed to Korea throughout the war—served as the X Corps artillery headquarters since that corps was independent of the Eighth Army for the first part of the war.⁶

This proved sufficient command and control for most of the war. The Eighth Army artillery officer’s post-war after-action report, which identified the lack of field artillery groups as one of the two major problems with the artillery in the war, overstated the problem of command and control. He noted that the command’s request for six field artillery groups in summer 1951 was turned down because of the troop limitations. One wonders what Eighth Army planned to do with six groups. Only nineteen non-divisional units served in Korea, a relatively low number. Even if they all served at the same time (they did not) that would leave only three battalions to each group. Groups in World War II normally had three or four battalions assigned and more battalions attached. More importantly, groups were vital in a fluid situation because they provided the necessary command and control for such a situation. By mid-1951, however, the front line had stabilized, and with the onset of the armistice talks, the United States did not seek to change this situation back to a mobile war. As one author noted in the post-WWII years, “in a fixed or semi-stabilized situation the problem [of massing units] is simply one of coordination. No one questions the value of massed fire which centralized control provides. In a fluid situation the problem is

to keep supporting artillery well forward. . . . Under such conditions it is a great mistake for the corps headquarters to hang on too long, . . . Then is the time to decentralize.”

In other words, during a stabilized situation, the artillery did not require the decentralized control field artillery group headquarters provided. The request for more group headquarters also overlooks the fact that many of the non-divisional units served direct support to South Korean divisions, since Korean divisions had only one 105mm howitzer battalion for artillery support. Under the stable conditions which prevailed, and which the United States expected to prevail, field artillery groups would have contributed very little, if anything, to the artillery effort. Their deployment would have limited the deployment of other more useful units. Therefore, despite one student’s opinion that “had [field artillery group] headquarters been provided, more effective field artillery support would have been possible,” one can reasonably conclude that the slight gain would have come at great cost. Although not a conscious decision on anyone’s part, the decision to limit the deployment of field artillery groups was the best decision under the circumstances.

The artillery pieces themselves were the same types used during the Second World War. Although adequate, these weapons suffered from a lack of an all-round traverse and an inability to elevate past 65 degrees. Despite some emphasis during the postwar years on improving old weapons and designing new ones, there was no


9 The conclusion is my own. See “A Study of the Employment and Effectiveness of the Artillery,” 3 for the postwar analysis of this situation.
discernable improvement in weapon’s design. Despite the scarcity of both guns and rounds in the early months of the war, however, artillery pieces generally held up well. Questions about the accuracy of the 8" howitzer, which persisted from WWII, continued to be debated without resolution. As the campaign in Italy demonstrated, it was also probably difficult to move the larger howitzers around the mountainous countryside. Despite the shortcomings, the weapons were, nevertheless, adequate for Korea.\textsuperscript{10} The artillery was able in large part to overcome most of these difficulties, and by fall 1950 fire support was generally considered adequate. To provide additional firepower even non-field artillery weapons, such as anti-aircraft guns, tanks and tank destroyers, were fired as indirect fire weapons.\textsuperscript{11}

**Perimeter Defense**

Artillerymen experienced significant difficulty selecting good battery and battalion positions in Korea. As in Italy, the restrictive terrain limited the choice of adequate positions and increased the difficulty of occupying the positions selected. In spring the thawing of the rice paddies further limited the choice of possible positions. Many times units deployed in areas susceptible to flash flood. Units often needed to


\textsuperscript{11}\textsuperscript{11}Cocklin, “Artillery in Korea,” 23, 26-27. Interview with Lieutenant General William P. Ennis, Jr., US Army Military History Institute Senior Officer Oral History Program, Project 84-6, interviewed by Lieutenant Colonel Miguel E. Monteverde, Sr., Carlisle Barracks, 1984, in the William Ennis Papers, 129. (Hereafter referred to as Ennis interview.)
position the guns closer to each other than desired to make room in a given area for
the entire unit. These close formations made the unit more vulnerable to counter bat-
ttery fire. Artillerymen in Korea also had to select positions which supported their
defense against infiltration by small bands of North Korean soldiers and guerrillas, as
they constituted an even greater threat than Communist counterbattery fire.\textsuperscript{12}

The Korean War was not the first war in which American artillery faced an
infiltration threat. The Japanese used infiltration to attack artillery positions in World
War II. Although artillerymen in the Pacific did not always have to provide for their
own protection, such as when they fired from one island to another, when they had to
protect themselves they initially did not do it very well. Units improved their abilities
as the war went on, however, and their Pacific experience suggested that when their
proficiency in patrolling increased, successful enemy infiltration decreased. By the
end of the war artillerymen had come a long way from the widespread pre-WWII
belief that the units to which they supplied fire support would in turn provide for their
defense. Unfortunately there was little post-war enthusiasm for teaching scouting,
patrolling, and other skills gained from the artillery’s Pacific war experience, skills
necessary to conduct an active defense. Consequently, after 1946, few artillerymen
considered perimeter defense important. The warnings sounded by a handful of artil-
erry officers, such as the one who on the eve of the Korean War advised that “the

\textsuperscript{12}“Lessons From the Italian Campaign,” (March 1944), 73, 91, 98-99; Boyd L. Dastrup, \textit{King of
Battle: A Branch History of the US Army’s Field Artillery}, Training and Army Doctrine [TRADOC] Branch
History Series (Fort Monroe, VA: US Army Training and Doctrine Command, 1992), 214; Stewart Yeo,
“Service in Korea, 12 December 1951-8 March 1953” (Unpublished MSS), in the Stewart Yeo Papers,
Section I, p. 3, (Hereafter referred to as Yeo MSS); “Special Problems in the Korean Conflict,” 56; Cock-
linn, “Artillery in Korea,” 23.
battalion commander who waits on the perimeter has only one chance to save his
guns[, t]he one who patrols aggressively has two,"^{13} went unheeded. The interwar
expectation that a future war would be similar to Europe in 1944-45 resulted in this
particular skill receiving insufficient attention.^{14}

The lack of sufficient attention to perimeter defense proved costly in Korea.
North Korean forces proved particularly adept at infiltration, and it was the worst
threat to the artillery in the first year of the war, particularly during the first retreat to
the Naktong River. The infiltrators, wearing civilian clothes over their uniforms and
mixing with the large numbers of refugees streaming south, targeted command posts,
support units, and artillery units. They were aided in these early months by the road-
bound American army, and the NKPA (North Korean People’s Army) freely used the
mountains to infiltrate into American units, with disastrous results for US forces.
American positions were easily bypassed and encircled. Ambushes on US truck
convoys were common. A particularly effective North Korean tactic against artillery
positions was to fire mortar shells into the position (which was not usually difficult to
find because of poor camouflage) to make the gun crews react. Once the crews re-
acted the North Koreans swept the area with machinegun fire. With such tactics the
North Koreans inflicted heavy losses on men, weapons (particularly towed weapons),


vehicles, and supplies at a time when artillery was already scarce. As a result, protection of artillery positions proved more difficult than at any time during World War II, and many artillery commanders found their primary task of providing fire support easier than the now-critical task of providing for their own defense.\textsuperscript{15}

Examples of this are so numerous that only a few will be presented. At the defense of the Kum River line in mid-July 1950 an infantry company under enemy pressure exposed the 63rd FAB to enemy attack. The North Koreans, with untested use of the hilly terrain, overran the unit and captured five 105mm howitzers intact. Five other howitzers had to be destroyed. Over 130 men were killed or wounded. The 52nd FAB lost eight 105mm howitzers and most of its equipment in the same action. In what would become an all too common practice, American aircraft were ordered the next day to destroy the captured equipment.\textsuperscript{16}

The next month near Pongam-ni, in an area known to US soldiers as “Bloody Gulch,” the 555th FAB lost most of its men and all eight howitzers present after hand-to-hand fighting with the North Koreans. Battery A, 90th FAB lost six 155mm howitzers and Battery B, 159th FAB came under heavy attack. Between these units


\textsuperscript{16} Appleman, South to the Naktong, North to the Yalu, 126-127, 137-138, 144, 179; Blair, The Forgotten War, 128, 129-131, 141.
over 300 men were killed, wounded, or missing. It was the worst catastrophe for the field artillery in the war. Although such attacks and overruns became less frequent as UN troops advanced up the peninsula in 1950, units were still susceptible to guerilla attacks. A particularly destructive attack occurred against the 96th FAB during the night of 6-7 November 1950. The unit suffered 40 casualties, the loss of six 155mm howitzers, and its trains with all its ammunition.

Chinese entry into the war increased the infiltration and overrun threat. The 61st FAB, denied permission to fire at the attackers, lost all eighteen 105mm howitzers to the enemy. (They recovered nine in a counterattack the next day.) Artillery losses at “the Gauntlet” the same month were tremendous. Of the four artillery battalions involved, the 17th FAB fared the best with the loss of only one howitzer, but the 37th FAB lost 10 howitzers, the 503rd FAB lost seventeen howitzers, and the 38th FAB lost all eighteen howitzers and all its vehicles.

The loss of functional artillery pieces approached ridiculous proportions, and on 3 January 1951 General Matthew Ridgway, commander of the Eighth Army, forbade, in writing, the abandonment of useable equipment to the enemy. Despite another warning from Ridgway the losses continued. With the loss of fourteen

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17 Appleman, South to the Naktong, North to the Yalu, 276-284, 285; Blair, The Forgotten War, 194-196. For other examples see Appleman, South to the Naktong, North to the Yalu, 294-295, 325-326, 383.

18 Appleman, South to the Naktong, North to the Yalu, 724.

19 Appleman, South to the Naktong, North to the Yalu, 105; Billy C. Mossman, Fob and Flow, United States Army in Korea Series (Washington, D.C.: Center of Military History, 1988), 67-69; Blair, The Forgotten War, 445, 490, 491. The reason the 61st FAB was denied permission to fire in its own defense is puzzling. Unfortunately the reason is not stated.
howitzers from the 15th FAB and four howitzers from Battery A/503rd FAB, Ridgway ordered General Edward Almond, commander of the X Corps, to conduct an investigation to fix responsibility. Ridgway believed the losses to be a command failure, but Almond apparently convinced him that the South Korean’s failure to hold their line was the main cause of the losses. Almond was probably correct in this specific case. In all too many cases, however, Ridgway was correct: the loss of equipment was due to the failure of leadership. Many artillery battery and battalion commanders simply gave up and their men felt no compunction to do otherwise. The losses continued, sometimes in large numbers. The beginning of the Third Chinese Offensive in April 1951 witnessed the 9th FAB’s loss of four howitzers in an ambush. The 555th FAB (again) abandoned thirteen of its 105mm howitzers under fire. By the end of the first year, total artillery losses between Americans and South Koreans stood at over 300 artillery pieces, a figure that staggers the imagination.  

Fortunately, however, many unit commanders, by example and force of will, kept their artillery pieces out of enemy hands. Early in the war Colonel Perry, commander of the 52nd FAB, personally led troops not manning guns to attack a North Korean unit’s flank, calling for artillery fire as he advanced. A few days later the 13th FAB’s executive officer organized and led a counterattack which saved Battery

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A’s howitzers which had been lost after the battery commander and executive officer panicked with their men.\textsuperscript{21}

Other artillery officers responded to the North Korean threat with tactical innovations of their own. Many commanders ordered their battalion areas to be no larger than 600 yards square. They believed this provided the optimal balance between dispersion to minimize the effect of counterbattery fire and compactness to maximize defense from infiltration. Gun positions were formed into an inverted “V” shape to better support each other, and positions were often dug to provide supporting fire all around the perimeter. Units established observation posts connected to the main body by telephone on nearby hills. Artillerymen patrolled distant hills with greater frequency, partially contesting what had been the North Korean’s most successful avenue of attack. Forward observers reported enemy movements in a timely manner, helping to prevent the overrun of artillery positions. Artillerymen often tried to get M1 rifles and Browning Automatic Rifles (BARs) from infantry units because many believed that the standard issue M-2 carbine 30 caliber was not rugged enough for the task at hand.\textsuperscript{22} Units which implemented such measures gained a significant edge in defending themselves over those which did not.

\textsuperscript{21}See Appleman, \textit{South to the Naktong, North to the Yalu}, 137-138, 226. See for other examples Appleman, \textit{South to the Naktong, North to the Yalu}, 441; Blair, \textit{The Forgotten War}, 442.

Commanders who implemented and enforced such measures often enjoyed success, while their less innovative and energetic counterparts failed. During the night of 3 September 1950 about fifty North Koreans infiltrated A/64th FAB, overrunning the outerposts and capturing some of the guns. The battery’s artillerymen responded quickly, however, and even engaged in hand-to-hand combat with the North Koreans rather than give up their guns. C/90th FAB provided timely artillery fires, and the battery defeated the infiltrators at a cost of seven dead and twelve wounded. On 1 November 1950 B/49th FAB fired point blank at an NKPA mortar company which had infiltrated past the 1/17th Infantry. After five minutes the few remaining North Koreans quickly retreated. The stand by Lieutenant Colonel Lavoie and his 92nd FAB in April 1951 is perhaps the best example of a successful defense. With only thirty-six hours to prepare, Lavoie decided to keep his unit in place. Using artillerymen as infantrymen and artillery in direct fire, Lavoie showed that, as he put it, “artillery, if it makes up its mind, will set itself up so that it can defend itself from enemy infantry action.”

Although battery captures decreased during UN advances, only the stabilization of the front lines in July 1951 brought relief to artillery positions. Enemy counter battery fire, however, remained a growing threat to the end of the war. Communist forces usually targeted known UN artillery positions when they attacked. US units, therefore, needed to be able to withstand the heavy enemy artillery fires, and many units constructed overhead cover to protect their guns and crews. Overhead cover had

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23 For these and other examples, see Appleman, South to the Naktong, North to the Yalu, 476, 713-714; Mossman, Ebb and Flow, 399; Blair, The Forgotten War, 367-368, 449, 829.
been used in the Pacific war to provide cover from the air bursts that resulted in the thick jungle canopy. Such cover proved good for morale because of the protection it provided, but it had made it difficult to fire the howitzers at their maximum elevation. Korea offered a similar tradeoff. Although overhead cover protected the gun crews and the ammunition, it limited the weapon’s ability to quickly fire in any direction and was therefore not universally accepted. Some artillery units required the construction of overhead cover because of the protection it provided; other units forbade such construction to maintain its weapons’ ability to fire in any direction. 24 Given the static situation that prevailed in the war’s last two years, the units which allowed overhead cover probably made the better choice because a unit was rarely, if ever, required to fire in a direction other than to its front. Certainly some compromise could have been struck. Four of a battery’s howitzers, for example, could have remained under cover while two remained ready outside to fire in any direction.

Artillerymen

Two manpower issues plagued the artillery throughout the war. The first was the constant struggle to maintaining personnel strength at required levels. Political considerations strictly limited the number of soldiers who could be assigned to Korea. To remain below the numbers yet spread the war’s burden, the Army rotated men in and out of Korea after service of about one year. The rotation policy, although

politically wise, created the artillery’s second problem. It was simply not possible to maintain units at anything more than acceptable proficiency because soldiers rotated back to the U.S. just as they acquired complete proficiency in their wartime tasks.

The first artillery units that deployed from Japan to Korea, (those belonging to the 24th, 25th, and 1st Cavalry Divisions) were all understrength. During the postwar years each division had lost an infantry regiment and each artillery battalion had lost a battery to budget cuts. These divisions’ artillery units required augmentation from the 7th Division prior to deployment to Korea. The 7th Division was augmented in turn by senior artillery NCOs from the United States as well as a large number of KATUSAs (Korean Augmentees to the U.S. Army), South Korean draftees assigned to serve in American units, prior to its landing at Inchon.

The decision to use South Korean soldiers to augment American units proved a novel solution to a common problem. Until October 1950, fifty to ninety KATUSAs were normally assigned to an artillery battalion. After October 1950, the figure dropped to about twenty-five per battalion. KATUSAs usually trained on the job, and generally for the last two years were enthusiastic learners. Their value to US units was mixed, however, largely because of the language difficulties between them and the Americans. Units principally assigned them as wiremen, ammo handlers, and cannoneers—tasks which did not require strong English language skills. Training in technical subjects, such as fire direction center procedures, was generally not possible because gunnery was too technical given the limited language skills. Despite these problems, KATUSAs generally performed effectively with the artillery units and
helped make up some of the manpower deficiencies. One overlooked advantage
KATUSAs provided to US units is the they did not rotate out of units as quickly as
Americans.25

The Army instituted the rotation system on 1 June 1951. Training immedi-
ately become the primary focus of artillery units to try to compensate for the constant
loss of experienced artillermen. It was only possible to overcome this to a limited
extent, however, and the extraordinary focus on artillery made the drop in combat
efficiency particularly noticeable. General Van Fleet, who replaced Ridgway as the
Eighth Army commander, believed it cost the artillery its ability to shoot quickly and
accurately. As the Eighth Army artillery officer’s postwar report noted, the rotation
system would have been a major liability in a fluid situation.26

Replacements were generally unprepared for combat duty on arrival. The
troop ceiling made it difficulty to assign soldiers to the jobs for which they were
trained, and many enlisted men required training on the job. Even units in the line
had to set up training schools to correct this problem. Such solutions would not have
been possible in a fluid situation.27

Problems among the artillery’s leaders existed as well. Units were short non-
commissioned officers, aggravating the problems with the enlisted force. Junior

25. "A Study of the Employment and Effectiveness of the Artillery," 37; “Special Problems in the

Artillery in Positional Warfare," 16; Blair, The Forgotten War, 912; “Report of the Artillery School Ob-
server Team," Tab A, 1; Hermes, Truce Tent and Fighting Front, 351, 186-187.

Team Number 6,” Tab F, 1-9; “A Study of the Employment and Effectiveness of the Artillery,” 36.
officers, many of whom were in command of artillery batteries, required extra supervision from their battalion commanders, which interfered with his ability to be an effective fire support coordinator to the regiment. Although the artillery community tried to assign lieutenants to artillery units in the U.S. first to gain experience, in practice state side artillery units assigned these officers to staff rather than line positions. Junior officers still came to Korea with no experience with soldiers.  

The Fire Direction Center

The post war period witnessed little improvement in fire control techniques and some techniques, such as the conduct of high angle fire, were largely forgotten. Officers and enlisted fire direction center personnel alike lacked key training. Fire direction officers were noticeably weak in gunnery and fire direction, and lacked knowledge about round dispersion necessary to bring rounds in close to friendly soldiers. Because soldiers constantly rotated in and out of Korea, this problem was never fully corrected.  

The types of missions employed by fire direction centers changed as the war went on. The most common missions in the war’s early stages were registration, defensive fire, harassment and interdiction, and fire against targets of opportunity. The change from mobile war to stabilized war, however, brought a change in the

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types and proportions of artillery missions. By the end of the war two-thirds of the missions were harassment and interdiction missions. Counter-battery fire accounted for almost one-fifth of the missions, and defensive fire and fire against targets of opportunity for most of the remainder.\textsuperscript{30}

Although artillerymen usually conduct registrations to produce more accurate firing data, in the war's early stages they used registration to plan the nightly defensive fires. Normally defensive fires would be several hundred yards out from friendly forces, but the enemy tendency to attack at night as well as the difficulty of seeing him until he was only about 400 yards away made it necessary to plan the fires closer than would otherwise be desired, normally about 150 yards from friendly positions. This requirement made it imperative that units fire rounds prior to an attack to ensure the rounds did not land on American soldiers. Artillery crews had to fire these barrages not only accurately but also quickly, and several units during the war extricated themselves while under enemy pressure only with assistance from these barrages. Occasionally such fire was called in on one's own position. In May 1951, the men of Company K, 38th Infantry waited inside their bunkers while their artillery support single-handedly defeated the Chinese who had entered their lines. When the Chinese pulled back, 800 of their now dead comrades remained as a witness to the artillery's

success. Although it was an effective technique, fortunately it was not required too often.\[31\]

Defensive fires are related to the final protective fire described above. Final protective fire is the last effort to keep the enemy from the infantry, while defensive fires attempt to break up an attack before that point. Many times the artillery broke up an enemy attack with a minimum of assistance. Artillery fire played a key role, for example, in breaking up the second North Korean attack across the Naktong River in August 1950. Artillery defensive fires played a crucial role in the pivotal battle of Chipyong-ni in February 1951. The best example of such fires is probably the “Wonju Turkey Shoot,” which occurred a month earlier. The artillery inflicted over 20,000 enemy casualties, one-quarter of which were killed in action.\[32\] Together with Chipyong-ni this action is one of the important turning points of the war.

Forward observers quickly learned to pre-register fire on likely avenues of attack, and sometimes units tied their artillery in with other defensive weapons. In the Bowling Alley, August 1950, artillerymen pre-registered on American minefields. When an enemy attack was halted in the minefield, the artillery was called in. During the Third Chinese Offensive in April 1951, the American use of pre-registered fires


inflicted great casualties among the Chinese attackers.33 This type of defensive fire became so common by the end of the war that one infantry captain commented that the infantry had become overdependent on the artillery and that this overdependence at times reached “ridiculous extremes.” A lieutenant countered that there was “nothing ridiculous” about the prodigious use of artillery, since it was a “much more effective killer than small arms in the dark.”34

Artillerymen fired harassment and interdiction (H&I) missions to keep the enemy off balance. These missions were often conducted at night to hinder enemy staging for a night attack. These mission were coordinated at corps level, and for much of the war’s first year, in a classic case of mirror-imaging, planners directed H&Is at the low lying areas. Since Americans rarely occupied the high ground it did not seem to occur to them that the enemy would be any different. Communist forces noticed this pattern, however, giving them even more reason to stick to the high ground. Only after debriefing captured Chinese soldiers did the Americans learn that they had inadvertently established a pattern. Afterwards they took care not to estab-
lish routine patterns. Sometimes, however, they used enemy knowledge of US artillery to their advantage. The Chinese were able to ascertain the approximate ranges of the artillery, and would conduct much of their activity just outside this range. The artillery employed two tactics to take advantage of this. First, artillerymen drove

33 Appleman, South to the Naktong, North to the Yalu, 357; Blair, The Forgotten War, 827; Mossman, Ebb and Flow, 430.

medium range howitzers closer to the front than normal to reach farther than normal beyond the front lines. Second, long range howitzers often fired to about only two-thirds of their maximum range. Once the enemy was operating comfortably just outside this range, artillerymen then fired their pieces at the maximum range. Artillery planners even targeted destroyed enemy equipment for H&Is at night because the Chinese often tried to repair damaged matériel at that time. H&Is became so common that tanks with nothing better to do were driven up banks in order to fire indirectly.  

Artillery was of course also used offensively against enemy concentrations in order to break up an expected enemy attack or to support a US attack. In one instance the 77th FAB damaged its guns firing 1,860 rounds into an enemy concentration. When many North Koreans became trapped behind UN lines following the breakout of the Pusan Perimeter, artillery was used against guerilla concentrations. Prisoners taken after many of these attacks testified to the dehabilitating nature of American artillery, and by the war's end, observed enemy movement during daylight almost invariably invited a prompt artillery response.  

Finally, US artillery used counterbattery fire against enemy artillery, particularly after the war's first year. By war's end nearly one-fifth of all artillery missions were counter-battery and they occurred on a daily basis. Although counterbattery fire


against mortars never achieved the desired results, counterbattery against artillery was as effective as possible with the resources at hand. The enemy replied by camouflaging and fortifying his artillery. Despite great efforts and experiments such as Operation Scrap Iron, the enemy’s artillery grew more effective as the war went on.\textsuperscript{37}

Any fire mission became much more complicated if it required firing at a high angle. High angle fire, the firing of a round at a greater than 45 degree angle, is often necessary in urban, jungle, and mountain areas where obstacles are commonly present near the battery position or the target location. American artillery developed techniques for such fire from their experience in the South Pacific and particularly in Italy during World War II. The inability of American weapons to elevate past 65 degrees made it difficult to hit targets effectively. Some targets simply proved impossible to hit, even when different propellant charges were used. In 1947 the artillery published rudimentary procedures for high angle fire in the Field Manual 6-40. These procedures, however, lacked the detail found in wartime solutions. This failure to properly incorporate these wartime lessons into the appropriate doctrinal manuals, combined with the conscious postwar decision that the 65 degree elevation capability was adequate,\textsuperscript{38} ensured that artillery units would again have difficulty if they needed to fire at high angles again.

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The most difficult problems with high angle fire were selecting the proper propellant charges, compensating for the increased drift caused by the spin on the round through a longer trajectory, and compensating for the increased effects of weather on the rounds because of their much higher trajectory. Charge selection was difficult because weapons limited to a maximum elevation of 65 degrees had a very limited range for each charge. This resulted in very little overlap between most charges under ideal circumstances, and in reality there was often dead space between charges that the howitzers could not hit. Changes to the charge during adjustment was common, and if a battery adjusted for other batteries more than 800 yards distant from its location, the other units often required a different charge, complicating the adjustment calculations such as the drift the rounds would have. Units also had to go through the time consuming process of registering high angle through several charges. Artillerymen in Korea gradually relearned the experience gained in Italy and the South Pacific, and improvised the necessary solutions, but the rotation policy kept units from gaining a high proficiency. Most junior officers assigned to FDCs were deficient in this ability, and high angle fire remained a challenge throughout the war.39

Observers and Fire Direction Officers used several shell/fuze combinations in addition to standard high explosive shell with point detonating fuze that exploded on impact. The proximity fuze, also known as the variable time or VT fuze was commonly used to achieve air bursts. Since the standard time fuze required the time to be

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pre-set prior to firing, a human error calculating the time to be set or in setting the
timer itself could result in a ground detonation or an ineffective detonation high in the
sky. The VT fuze did not require a detonation time to be set, since it used radar to
explode at the predetermined height of about 20 meters. It was therefore easier to use
the VT fuze when firing at a high angle since the tolerance in setting the time fuze
was so small. The fuze was particularly effective against soldiers in the open. Its
most significant drawback was that it could not be used in heavy rains since it might
read the rain as the ground and thus explode in the air. 40

Fire direction officers used delay fuzes when the observer required some
degree of penetration of the target prior to the round’s detonation, such as when firing
at bunkers or other fortified locations. It was at least once, however, creatively em-
ployed against the underwater bridges the North Koreans had built across the Naktong
River in their first attempt to cross. 41

Illumination shells were in short supply and great demand. They were in short
supply because the artillery community determined that based on their World War II
experiences that illumination rounds were not very important. They were in great
demand because the enemy preferred to attack at night. Illumination shells, when
available and properly employed, made a significant difference, as they did at the key
battle of Chipyong-ni. When unavailable or when used unresponsively, however, the
results could be detrimental. In one case the time lag between the illumination

40Pick, “Forward Observer in Korea,” 32; Appleman, South to the Naktong, North to the Yalu,

41See Appleman, South to the Naktong, North to the Yalu, 316.
request and the response was so great that many North Korean infiltrators were able to make it through the American lines without being observed.⁴²

**Service Battery**

The service battery was responsible for procuring, transporting, and delivering the battalion’s ammunition. Much has been written about ammunition shortages in the Korean War, and it was even the subject of a Congressional investigation during the war. There is little that could be added to the subject, but a brief overview of the ammunition system in use during the war is warranted.

Ammunition itself received little attention in the post-war years. Fortunately ammunition management received somewhat more, and the army developed a system to better handle artillery ammunition expenditures. In January 1950, the Army published SR 700-310-1, “Ammunition Supply in the Theater of Operations,” which established the “Basic Load of Ammunition” or “continuous refill system.” Logisticians using the system compared expected ammunition requirements to available ammunition, and then established by ammunition type the number of rounds an individual weapon could fire each day for a period of ten days.⁴³

The system necessitated a proper understanding of several key terms, the most important of which were basic load, ammunition day of supply, required supply rate,

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and available supply rate (ASR). The ammunition controversy swirled around the available supply rate, the most important of the terms to the artillerymen crewing the howitzers. ASR is the “rate of ammunition consumption which can be supported with ammunition on hand,” and like the required supply rate was expressed in rounds per weapon per day. During the Korean War the ASR was announced for ten day increments. Commanders could at their discretion shoot in excess of their daily allotments, but could not exceed their allotments for each ten day period. Even ammunition in excess of the basic load could not be fired if in doing so a unit would exceed its allotment, a stipulation which attempted to prevent units hoarding artillery ammunition, a common occurrence during World War II. Unlike the previous war, Ammunition Supply Points (ASP) maintained records of ammunition issued as part of the ASR. Units no longer had large amounts of ammunition of which only they were aware. From a tactical point of view, the ASR was the only number that really mattered.

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44 Basic load was “the quantity of ammunition which is carried by individuals and on vehicles in the unit,” which the Department of the Army established this quantity for each unit. This basic load was broken down by percentages into the prescribed load. This was a breakdown by type of the different types of ammunition a unit was required to have on hand. Unlike other ammunition issued to units, a supply point considered the basic load ammunition expended upon issue. This basic load was in effect reserve ammunition, but it was not be fired lightly. While it might have been reassuring to both infantry and artillery commanders that this ammunition was available, the requirement to have it on hand (and thus transport it when the unit moved) probably significantly contributed to the already difficult task of vehicle maintenance. An ammunition day of supply, the “estimated quantity of ammunition required per day to sustain operations in an active theater,” and required supply rate, the “rounds per weapon per day required to maintain operations of a unit without restriction” concern projected expenditures and are closely related. These were tabulated numbers determined by previous (WWII) combat experience based on a unit’s size and anticipated mission. Commanders used these numbers to inform higher headquarters what their anticipated needs will be. See Henry, “The Ammunition Supply System,” 29, 30-31.

Little had been done in the postwar years to ensure an adequate wartime supply of ammunition. The large ammunition stocks left from the Second World War allowed strategic planners to procure items other than ammunition, such as food, clothing, and medical supplies. Between 1945 and 1950, however, most of the post-war stocks were sold, used for training, or simply deteriorated. The cotton bags used as a wartime expedient to hold ammunition propellant bags deteriorated faster than if silk bags had been used. Even fuzes and white phosphorus rounds, which were made out of more durable materials, proved defective in large numbers. These stocks had not been replaced, and at the outset of the Korean War only 45 days of ammunition supply remained in the Far East Command. No logistical contingency plan existed for this situation. As a result, ammunition was desperately short on the UN side in the war's early days.

Despite such logistical hurdles such as the long sea lanes and the poor internal transportation network, by fall 1950 artillery units were generally well supplied. The next year artillery units often had sufficient rounds to fire several times their ammunition supply rate. As General Carter Magruder, who worked in the Pentagon's supply section pointed out, General Van Fleet complained of the artillery ammunition shortage at a time when U.S. forces were outfiring their Communist counterparts twelve to one. Contrary to popular opinion at the time, artillery units in World War II often

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experienced severe rationing, and artillery units in Korea experience rationing much less severe than their World War II counterparts had experienced.

The reality was that there was an ammunition shortage from a global viewpoint, not from a tactical viewpoint in Korea. If a war had broken out in Europe the lack of adequate artillery ammunition supplies would have been grave. Artillerymen in Korea simply overstated the effects of the restraints imposed. Unlike Europe, where at least soldiers could measure progress by ground gained, there was no ordinary measure of success that was meaningful to the ordinary artilleryman. The frustration which this situation caused, combined with the fact that artillery was rationed at all, led him to believe he was being shortchanged. The raw numbers of ammunition do not bear this out. Not only did the relatively small numbers of battalions in Korea fire almost as many rounds as all the field artillery battalions in the entire Second World War, but they had many more rounds with which to fire harassment and interdiction missions than did their WWII counterparts.

Conclusions

As in World War Two, the field artillery battalion's organization and doctrine were basically sound. The additions of six guns in the light and medium battalions, which comprised most of the battalions deployed to Korea, provided additional fire

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47 Magruder, Recurring Logistic Problems As I Have Observed Them, 15, 16.

with little increase in overhead. The few disadvantages incurred with a larger number of guns was more than offset by the gains in extra fire power.

Once the war settled down the Basic Load system worked well, and the artillery fired several times more rounds as battalions did in World War II. For all of the restrictions under which many artillerymen perceived themselves to be operating, the wonder is that the restrictions were not greater given the long Pacific sea lanes, the poor internal transportation network, and the need to supply other commands. There were (and will always be) restrictions to artillery ammunition because it was easy to fire a large amount quickly. These restrictions, however, never affected combat. As General Magruder found out when he surveyed artillery battalion commanders during the war, if a commander needed ammunition, it was available.49

Notable and unexcusable deficiencies did exist. The most crucial was the lack of attention in the postwar period to perimeter defense. The North Korean infiltration threat was similar to that which artillery units faced in the Pacific Theater in WWII, and even artillery units in Europe planned perimeter defense against armored thrusts. Brief discussions on increasing the numbers of automatic weapons for a battalion’s defense had no impact, and except for a few artillery officers perimeter defense ceased to be an issue. This oversight proved costly in both men and matériel in the first year of the Korean War. The number of useable weapons that fell into enemy hands was ridiculously high. A certain amount of equipment losses always occurs during retreats, but a high percentage of these losses was caused by poor planning,

49 Magruder, Recurring Logistics Problems As I Have Observed Them, 16.
poor training, and poor leadership. The direct human cost was high. In addition to the direct human losses, there is the unknowable number of others who could have been saved had American artillerymen retained use of their weapons.

Less costly was the failure to institutionalize the procedures required to conduct high angle fire. As with perimeter defense, the artillery had experience with this procedure in both the Pacific and in Europe (Italy). For all of the otherwise sophisticated fire direction procedures which had given the American artillery a significant technical edge over its battlefield opponents, this failure is puzzling. Unlike perimeter defense, which required changes to equipment and no small amount of training, the proper procedures to fire high angle would have only required a few pages somewhere in the appropriate manual, as was done after the Korean War. Had this been done it would have been an easy matter to refer to the manual to learn the procedure. High angle fire simply seems to have “slipped through the cracks” after World War II.

The weapons themselves were adequate to the task. They had served well in World War Two and continued to serve well in Korea. The lack of an all round traverse and the inability to elevate past 65 degrees, which hindered high angle fire, was more of a problem in Korea than it had been in World War Two. The post-war designs represented only a marginal improvement over weapons in the inventory, however, and would not have corrected these deficiencies. Given the budgets that prevailed in the late 1940s the improvements were not worth the cost. Aside from these two drawbacks, artillery pieces proved reliable and accurate under most circum-
stances.

Overall the field artillery battalion performed as expected. It provided accurate and timely artillery support most of the time. Its basic organization worked well and its doctrine was basically sound. Its weakest link was its own ability to defend itself. Even when properly trained, however, perimeter defense is difficult for an artillery unit because of its poor manpower to area occupied ratio. Despite this weakness the field artillery battalions performed their wartime mission well.
CHAPTER II
TARGET ACQUISITION

The field artillery's forward observers and the field artillery observation battalion provided the human and electronic means by which the artillery acquired targets and adjusted its fire onto those targets. Forward observers provided the primary means of human observation. Field Artillery Observation Battalions provided human and, more frequently, electronic means of observation. Together they formed the primary observed fire methods for directing the artillery.

During the postwar period the field artillery made great strides in forward observer technique. In the summer of 1947 the artillery adopted the target-grid method as a means to call for fire. The fire direction center no longer required the observer's location to plot a target. The artillery also simplified the adjustment process. Observers could now make corrections based on the observer-target line, the imaginary line between the observer and the target. He therefore made corrections as he saw the rounds.¹ The War Department established in Training Circular 6 a common language by which all the services could call for fire. The artillery increased the

¹Previously the observer made adjustments based on the gun-target line, the imaginary line between the guns and the target. This technique required the observer to calculate the angle between the gun-target line and the observer-target line, and produce an adjustment based on the former. With the new technique, the fire direction center made those calculations.
number of forward observers to three per battery, making it possible for each supported rifle company to have its own observer. The only significant uncorrected deficiency during the postwar years was the failure to improve the observers' radios. Despite problems the observers experienced in World War II with the standard 600-series radios and the success they had with the infantry's 300-series radios, the post-war change to the Table of Organization and Equipment simply authorized more 600-series radios.²

The Field Artillery Observation Battalion was a specialized unit at corps level whose primary mission was to locate enemy artillery. The battalion consisted of three sound and flash ranging batteries, a meteorological platoon, a survey platoon, and a radar platoon. Flash teams were emplaced in surveyed positions. When one or more teams saw an enemy artillery flash they would call their headquarters with the direction from their position to the observed flash. Using this method, at least two, preferably three, sightings were required to triangulate accurately the location of the original flash. The sound teams acted as an electronic ear. Like the flash teams, they were also surveyed into their locations. The time lag between different stations' reception of the same sound provided accurate target locations. Radar, which was still in its infancy, provided a sort of electronic eye. Though the practical results were often disappointing, it showed a promise that many artillery officers chose to pursue after

the Second World War, and radar was added to the Table of Organization and Equipment during the postwar period on an experimental basis.³

Field Artillery Observation battalions played a vital role in the artillery’s counterbattery effort during World War II, particularly when the front lines did not move much. Sound ranging had been particularly valuable when enemy pieces were hidden from observation. In Italy, however, the mountainous terrain distorted sounds, and location by this method was not always reliable. Flash ranging also played a vital role in the war. When flashes could be observed no terrain could distort them. In the mountains, however, the intervening crests often made such observation difficult. Despite these difficulties, sound and flash teams performed well in Italy when the lines were stable.⁴

Radar’s success was mixed in WWII. Nevertheless, the Army proceeded to integrate radar into the observation battalions because it recognized the value radar technology played in other branches. Radar offered several possibilities to the artillery. It could locate enemy batteries and, by using the same technique on a friendly unit, perform approximate survey of that particular unit. While not as adequate as standard survey, it was better than no survey, and at any rate would only serve until the unit could be properly surveyed in. It was also capable of adjusting friendly

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artillery. Because the survey requirements for the radar platoon were considerably less than the sound and flash ranging platoons, many believed that radar would be more effective in pursuit operations. Even prior to the Korean War, however, knowledgeable artillerymen realized that radar would not operate as well in a mountainous environment. The increased screening elevation to clear all hills lessened the trajectory radar could track, which decreased the accuracy of the results. The army recognized these difficulties and intended radar to be a complement to, rather than a substitute for, the sound and flashing ranging platoons.⁵

Meteorological technique also advanced significantly in the interwar period. During World War II meteorological sections were equipped only with visual equipment, which could only determine wind direction and speed. The artillery often acquired the more detailed meteorological messages from the Army Air Forces, but the distance of AAF’s weather stations from the point of firing degraded the accuracy of the information contained in these messages. The electronic equipment developed and issued in the postwar period significantly improved the situation. Meteorological messages now included not only wind speed and direction, but also air pressure, temperature, and humidity. This additional information increased the artillery’s ability to compensate much more accurately for the variables caused by weather.⁶


Overall the postwar period proved productive in the areas of target acquisition. The artillery simply had to apply the equipment and doctrine upon which it had decided when the time came.

**Forward Observers**

Although observers in Korea praised the target-grid system, initial training deficiencies, hilly terrain, substandard maps, communication difficulties, enemy action, and generally poor Korean weather all combined to make a forward observer’s task difficult and his life unpleasant during the war’s first year. The target-grid method of fire became the most common means to call for fire, and observers enthusiastically praised its effectiveness. Although many artillerymen believed that “the adoption of the target grid method of fire vastly improved observer technique,” others recognized that many forward observers required more training in the new procedure. No one, however, criticized the new method itself. The target-grid method of calling for fire was probably the most important technical improvement in the post-World War II field artillery because of the ease in which it could be taught. The training

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7Although one did not have to be an artilleryman to call for fire, many infantrymen early in the war did not know how to perform this important task. If they lost their artillery forward observer to enemy action they more often than not lost their artillery support. As the war went on, more and more non-artillerymen learned to call for fire and acted as observers. For our purposes, however, the only forward observers with which we well concern ourselves are those who were artillerymen.


deficiencies would likely have required more effort to correct without this method to call for fire.

Substandard maps available to the forward observers aggravated the difficulties of calling for fire. Of the 333 maps in the 1:50,000 scale (the standard scale map for ground combat forces) the armed services used in Korea, all but about 50 of these were difficult-to-read black and white reprints of Japanese maps. None of the maps had the Universal Transverse Mercator system that the Department of Defense recently adopted and which the observers required to most effectively use the target-grid method of fire. The mountainous terrain made accurate map locations and range estimations vital, but map inaccuracies varied by as much as 200 yards. Unobserved fire was all but out of the question, as demonstrated by the attempt to do so around Taejon in July, 1950. The military required about a year to rectify the map problem, and in the war’s last two years map inaccuracies affected only a small portion of artillery fire. For the first year, however, forward observers (and everyone else whose work required a map) had to make due with what was available.

The poor quality of maps made the already difficult task of calling for fire on targets located on mountains even more so. Calls for fire in mountainous terrain requires great care because exact locations are difficult to ascertain. Further, if the initial round needed adjustment, even a small correction on the guns can result in a large shift on the ground. Despite similar experiences in Italy, the experience of

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calling for fire in the mountains had been lost in the post-WWII focus on northwest Europe. Many lessons, such as the need to halve corrections if larger-than-expected shifts were observed on the ground, needed to be relearned. Enemy forces made full use of the advantages the mountains gave them. Most of the time Communist forces used positions on the top and the reverse slope, making themselves difficult to observe, let alone hit. Moreover, almost all Korean hills had abandoned positions on them and the enemy was very proficient in the construction of dummy positions.\footnote{Pick, "Forward Observer in Korea," 31-32; Bauer, "Mountain Firing With Air Observation;" Harrity, "A Forward Observer Reports from Korea," 28.} For all the artillery’s technical capabilities, observers lacked the experience to fully use these advantages to neutralize as much as possible the great enemy advantage of operating on and over hills better than the Americans.

Forward observers experienced tremendous difficulties with radio communications, particularly in cold weather. Even though the stabilized situation brought some relief, problems persisted throughout the war. The standard issue SCR-619 radio would have been adequate in most circumstances. In Korea, however, its limited range (10 miles), great weight (over 60 pounds), short battery life, and inability to survive rugged use compared to the infantry’s 300-series radios did not endear it to most observers who had to carry it on their back over hilly terrain. The equipment was sufficiently heavy that if an observer were forced to withdraw under enemy pressure he usually abandoned some of the equipment. There were several instances in Korea in which the radio’s liabilities adversely affected the artillery’s capabilities. In the fight around Taejon in July 1950, for example, most of the 600-series radios’
batteries quickly gave out. Without replacement batteries, the radios were useless.

The breakdown of observer radios the same month around Choch’iwon kept the 3rd Battalion, 21st Infantry from using its artillery support. Forward observers frequently lost communication with the artillery units when they moved,\textsuperscript{12} an obvious handicap during much of the war’s first year.

Forward observers worked hard to overcome these communications difficulties. As in Italy, artillerymen often sought 300-series radios from the infantry. These radios were lighter, more durable, and had greater range. Although radio shortages existed in most combat units, forward observers managed to obtain them in large numbers. In the observers’ hands they played a crucial role in the final phase of the fight for the Pusan perimeter in August and September 1950. The use of the SCR-399 radio also proved “very satisfactory”\textsuperscript{13} at the Battle of the Soyang River in April, 1951, and the effective use of artillery during that battle was largely credited to good communication. Other solutions also proved effective. Relearning yet another lesson from its Italian experience, the artillery set up relay stations to assist the observer in maintaining contact when he moved. During the last two years of the war the artillery issued the RC-292, a powerful antenna which reduced the need for a relay. Unfortunately, these antennas were never present in sufficient numbers to become standard issue, but observers made good use of the ones available. Finally, observers

\textsuperscript{12}“Study of the Employment and Effectiveness of the Artillery,” 28, 30; Blair, \textit{The Forgotten War}, 431; Pick,“Forward Observer in Korea,” 31; Cocklin, “Artillery in Korea,” 25; Appleman, \textit{South to the Naktong, North to the Yalu}, 180, 97-98.

\textsuperscript{13}X Corps, “Battle of the Soyang River,” inclosure 1, p. 2.
were eventually issued the AN/PRC-9 radio. Although the receiver had to be held to
the ear when no loudspeaker was available to attach to it, it nevertheless improved
both the observer’s ability to move and to communicate.\textsuperscript{14}

The artillery’s use of wire proved an important means to augment radio com-
 munications between observers and artillery units. The combination of the difficult
terrain and the fluid nature of combat during the war’s first year made the use of wire
difficult, as it could not be laid and reclaimed with sufficient speed to keep up with
the changing situation. Wiremen sought ways to lay wire faster, and tried using such
equipment as the helicopter and the grenade launcher to quicken the laying. Helico-
ters were simply too scarce to be allocated for such use, however, and the attempt to
use grenade launchers to lay wire simply did not work. In the end, the best solution
was simply to weld a roll of wire to the observer’s jeep and lay and recover the wire
as the vehicle moved. Artillery units also employed large numbers of KATUSAs as
wire layers because the task did not require sophisticated English language skills.\textsuperscript{15}

Even when successfully laid, problems occurred with the wire itself. Even
when buried and shielded, wire went out easily when shelled. This forced units to
avoid laying multiple lines as a cable. Although laying multiple lines as a cable was
both neater and easier, artillerymen were not prepared to risk the loss of all their wire
lines with one lucky shot. Single wire laying therefore remained the preferred

\textsuperscript{14}“Lessons From the Italian Campaign,” (10 March 1944), 111; Pick, “Forward Observer in Korea,”

\textsuperscript{15} Pick, “Forward Observer in Korea,” 31; Cocklin, “Artillery in Korea,” 24-25; Ennis interview,
170.
method. Not all problems stemmed from enemy action. Although most units meticulously recovered wire, some units were not so diligent. The South Koreans contributed further to the problem. If the wire reels were not well hidden, South Korean soldiers sometimes destroyed them because they thought they were enemy booby-traps. In at least one case the inhabitants of one village kept cutting wire up to use as rope.\footnote{16}

Although communication problems were detrimental, observer problems with the enemy were deadly. The North Koreans, and later the Chinese, inflicted high casualties among observers in the early stages of the war. During the fight for “Old Baldy” from 15 August-30 August 1950, for example, the see-saw battle for the hill resulted in the loss of seven observers from the 159th Field Artillery Battalion, as well as the loss of eight radios and seven telephones, at a time when both men and communication equipment were scarce. Many of these early casualties could have been avoided with rudimentary training in counter-guerilla and basic infantry tactics. The failure to properly select and reconnoiter alternate routes of retreat also contributed to the encirclement and elimination of artillery observers. Although few American units were overrun during the war’s last two years, effective enemy sniper fire picked-off many observers. Sniper losses comprised most of the artillery casualties from mid-1951 to the armistice, and the Americans expended a great deal of effort to take out enemy observation and sniper positions. These efforts were only moderately

\footnote{16}“Study of the Employment and Effectiveness of the Artillery,” 28; X Corps, “Battle of the Soyang River,” Inclosure 1, p 2; Ennis Interview, 170-171.
successful, however, and to the end of the war sniper fire tended to discourage many artillery observers.\(^{17}\)

Enemy night attacks and the Korean weather often hindered artillery observation. Rain, fog, and low clouds tended to characterize summer; snow and bitter cold tended to characterize winter. Visibility was often less than 600 yards in daylight, and even less at night, when the enemy preferred to attack. Forward observers registered artillery in front of their positions prior to dark in anticipation of enemy action.\(^{18}\) Unlike many problems faced by the observer, nothing could be done about the weather, and little could be done to prevent night attacks. All in all, the artillery forward observer was faced with serious obstacles in accomplishing his mission, and the wonder is that he performed his mission as effectively as he did.

Except for the threat of sniper activity, the forward observer’s life became noticeably easier during the war’s static phase. Not long after the lines stabilized around the 38th Parallel, bunkered observation posts stretched across the Eighth Army’s entire front. Observers often made these bunkers by tunneling in from the reverse slope of the hill, thereby maintaining the terrain’s original silhouette. Many times, however, the terrain was too rocky to do this, and observers then built their observation posts (OPs) from timber and sandbags. OPs so constructed were visible to the enemy and invited fire, and had to be built strong enough to withstand at least

\(^{17}\) Harrity, "A Forward Observer Reports from Korea", 28, 29; Appleman, South to the Naktong, North to the Yalu, 374-375; Cocklin, "Artillery in Korea," 27; Hewitt, Oral History Interview, 255, 256.

a direct hit from a 105mm shell. Artillerymen often competed with tanks and other weapons for key terrain. Observers normally considered it advantageous to use several OPs to cover a given enemy area in less conspicuous terrain than using one OP in a location that was more susceptible to enemy action.\textsuperscript{19}

Because artillerymen usually had no training in constructing bunkers, the long-term survivability of the bunkers to attack or to even just withstand the elements was low. Many artillerymen urged Fort Sill to instruct junior officers in proper construction methods during the Officer’s Basic Course. Most artillerymen learned by trial and error, however, and solutions tended to be negative. Sandbags, for example, were prohibited for use as walls because drastic changes in weather caused them to deteriorate rapidly. Little advice was given, however, on what to use instead. Eventually units used prefabricated observation posts which they carried to and assembled at the desired location. The problem of heating the bunkers was never solved, and many observers spent the winter months just trying to keep warm.\textsuperscript{20}

The last two years of the war brought much relief to the communications situation. It became possible to lay multiple lines to the fire direction centers as well as to lateral and rear units. Artillerymen built significant redundancy into the communications system. Wire still tended to go out under enemy shelling, however, and radio remained the primary means of communication. Shelling also tended to destroy

\textsuperscript{19}“Study of the Employment and Effectiveness of the Artillery,” 9; Boatner, “Countering Communist Artillery,” 25.

radio antennas, and most observation posts were equipped with spare radios. Artillerymen used slack times well to check both their wire and radio communications. Deficiencies in radio and telephone procedures, however, continued to the war's end. Units usually made up their own codes rather than use army-issued codes because they found the latter too difficult. Although such non-standard codes eased intra-unit communication, the lack of practice with standard codes sometimes affected inter-unit communications.²¹

The stabilized lines brought further advantages. It was possible for observers to become very familiar with the terrain to their front. Most observers were issued 1:25,000 scale maps of the area for greater accuracy. Many units complemented these maps with panoramic photographs of the area under observation. Observers used the photographs primarily to orient new observers to the area. Many observers successfully taught non-artillerymen in their unit how to call for artillery fire.²² Compared to the first year of the war, the forward observer's task was easier and his life was better.


Aerial Observers

In the post-World War II period aerial observation received detailed attention. The artillery's experience in the Second World War demonstrated both the utility and difficulty of using modern aircraft in an observation role. As in World War II EUSAk employed surveillance flights to view the battlefield, and overall aerial observation in Korea mirrored the successes of the Second World War. Aerial observation proved very useful in Korea because Communist forces conducted much of their activities on reverse slopes.23

The aerial observer's most important advantage was his ability to use the artillery to its maximum range. During the last two years of the war aerial observers normally operated between 6,000-10,000 feet as far as 10 miles behind the front lines. Since United Nations forces completely controlled the air over the battlefield and because Communist air defense weapons were less sophisticated than the Germans' had been, observer aircraft operated about 2,000 feet lower than they had operated in Europe during World War II. Only poor weather interrupted aerial observation. Though observers found the best times to fly to be late dusk and early dawn, when enemy artillery flashes were easiest to spot, they even flew at night if there was sufficient moonlight. Pilot training was adequate, and the L-19, the observation plane of choice, was a reliable, low-maintenance aircraft which possessed excellent flight

characteristics for the task. Pilots assigned to fly observation aircraft did so for the first six months of their tour in Korea. If they survived, they spent their last six months flying administrative runs behind the lines. (One presumes that the reverse order might have made some pilots more cautious over enemy lines than would be desired.) The observers were drawn from the pool of inexperienced lieutenants who preferred flying behind enemy lines to living in a mountains, and volunteers exceeded vacancies. These aerial observers added an important dimension to the human side of observation, allowing the artillery to fire on targets that would otherwise be unknown and allowing for first-hand damage assessments that might not be seen in a photograph.24

The Field Artillery Observation Battalion

In July, 1950, General MacArthur asked for, among other things, a field artillery observation battalion. His request for this unit was quickly approved. Nearly half a year passed, however, before EUSAK allowed the 1st Field Artillery Observation Battalion to perform its primary mission of locating enemy artillery. In a gross display of poor judgment, the 1st Field Artillery Observation Battalion deployed to Korea in July, 1950 only to have its vehicles and drivers commandeered to drive supplies to the front. Although one can appreciate the desperation of the American military position, that situation was all the more difficult at the time because American artillery located enemy artillery only with great difficulty. In a similar display of

24“Study of the Employment and Effectiveness of the Artillery,” 1, 11, 12; “Lessons From the Italian Campaign,” (15 March 1945), 104; “Lessons From the Italian Campaign,” (10 March 1944), 79.
poor judgment under less desperate circumstances in December 1950, the artillerists of the 1st FAOB were ordered to turn in their equipment and draw 105mm howitzers to help defend Seoul. 25 It is unlikely that the supplies the unit's trucks drove to the front in the first instance or the firepower put out these 105mm howitzers crewed by inexperienced gunners in the second instance came close to offsetting the gains the unit could have made performing their actual mission: locating enemy artillery so that it could be neutralized or destroyed.

By early 1951 the battalion again retrieved its equipment and no further attempts to deprive US forces of this unit's capabilities occurred again. Even when properly equipped and employed, however, one field artillery observation battalion was simply not enough to go around in an area which doctrinally required three to five such battalions. The after-action review of the Battle of the Soyang River of April 1951 records that the lack of sound, flash, and radar teams hampered counter-battery work. This deficiency plagued the artillery's counterbattery effort throughout the war. The result: both North Korean and Chinese artillery improved throughout the static phase. Their use of artillery grew bolder and more effective, subjecting UN soldiers to artillery barrages known by few American World War II veterans. 26

The absence of similar battalions did not prevent the soldiers of the 1st FAOB from doing the best they could with what they had. The difficulties were many.

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26X Corps, "Battle of the Soyang River," inclosure 2; Report of the Artillery Observer Team, 12 March 1953, Tab B, p. 2; Yeo MSS, Section 1, p. 5; Summers, Korean War Almanac, 114; Blair, The Forgotten War, 948; Hermes, Truce Tent and Fighting Front, 100, 200.
Korea's mountains, like those in Italy, limited the effectiveness of sound ranging operations. Poor site selection early in the war aggravated this. Like most American forces, sound ranging platoons preferred to avoid hilltops and to remain in low areas. Both the physical exertions and the platoon's effectiveness were thereby much reduced. The battalion also experienced significant difficulty keeping up with the front lines during the advance into North Korea from September to November 1950 because of the stringent survey the various teams required. UN forces simply advanced too fast for one observation battalion.²⁷ Had there been more than one battalion it might have been possible to leapfrog them. One battalion, however, was not going to be much use during periods of rapid movement.

As the artillery had already learned in World War II, however, the observation battalion proved most effective during the war's static phase.²⁸ Sound platoons, in particular, demonstrated their value at this time, accounting for approximately 89% of target locations for the battalion. Having learned the importance of good site selection, the battalion placed sound bases on higher ground. The unit had twice as many sound platoons as normally authorized, partially offsetting the overall lack of observation battalions (at the expense of command and control). Although sound (and flash) sightings ranked fifth in overall importance for generating target information during the Korean War, sound sightings proved very useful when combined with photo


interpretation, the second most important means of generating target information. Photographs were rechecked when presented with sound ranging information. Often targets previously unnoticed appeared on closer examination of the photos of the suspect area. This combination was “probably”\textsuperscript{29} the most effective means to determine targets for counterbattery fire.

The flash platoons did not fare as well as the sound platoons. The terrain adversely impacted on their mission as well. Unlike the sound platoon, however, no complimentary means of acquiring target information existed. During daylight, flashes could not be seen at a great distance, and flash teams usually made their most effective sightings only at night by observing sky glow. Even then most sightings were made by only one station, which ruled out triangulation. Teams instead determined direction and estimated distance, a much less accurate method to determine target location. Flash teams perhaps made their greatest contribution as alternate forward observers.\textsuperscript{30}

The lack of trained personnel to operate both sound and flash bases remained a significant problem throughout the war, and significantly hindered the battalion’s ability to become fully proficient in its tasks. The battalion initially used its radar operators to staff sound bases, but once all five radar sets became operational other solutions were required. The battalion even set up its own school to crosstrain

\textsuperscript{29}“Study of the Employment and Effectiveness of the Artillery,” 14.

artillerymen in observation techniques. The problem of mismatched jobs was common throughout the Eighth Army because of the stringent troop ceilings, however, and the battalion could do little about it.

Radar proved a mixed success. As many officers predicted before the Korean War, radar had difficulty in mountainous terrain. Nevertheless, visionary artillerymen made the radars work as well as possible. Lieutenant Colonel Eugene Lee, commander of the 1st Field Artillery Observation Battalion for most of the war, assessed that though radar had proved "very unpredictable," it nevertheless had "made tremendous strides since its dark days in the early phases of the war . . .". Unlike other military occupation specialties, radar operators were school trained and, initially at least, enthusiastic worked to make radar successful. The frequent displacements, difficulty in getting spare parts, and susceptibility to enemy ground attack during the war's first year, however, sapped much of this initial enthusiasm.

The radar operators persisted, however, and by early 1951 radar achieved its first successes with two SCR-784s, the standard issue corps counterbattery radar. The SCR-784 was a modified anti-aircraft fire control set. Its maximum range was 16 miles and it was usually placed one to two miles behind the front line. The divisional counter-mortar radar, AN/TPQ-3, did not work as well as hoped. It nevertheless


became an important source of target location. The fielding of the AN/MPQ-10 in August 1952 proved particularly difficult, and it required many months to work out its problems. Some success in using this radar to track and control observation aircraft occurred, but such use remained experimental. Regardless of model, radar remained primitive throughout the war. It was difficult to find suitable locations, and often locations which seemed promising proved to be subject to significant ground clutter. Nevertheless, radar showed promise, and many artillery officers were prepared to continue refining it after the war ended in 1953.34

As for the observation battalion's two other missions, survey and metro, both were aided by the stabilized situation. Eventually the battalion established such an excellent survey system that many surveyors were trained instead to be forward observers because there was little need for more survey. The meteorological station also performed well. Although metro was criticized in a post-war after-action report for its lack of prediction and the inability to interpolate the results for areas between stations,35 these capabilities remain beyond the ability of metro stations even in the 1990s, and it was unreasonable for the author to think that this could have been done in the Korean War. Metro stations provided more information to artillery units than they had World War II. Had Fire Direction Officers been more proficient at

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incorporating this data into their firing calculations, the metro station’s contributions might have been more apparent.

Only once was the battalion consolidated. From 1-10 November 1952, the battalion supported the IX Corps’ counterbattery program in Operation Scrap Iron. Enemy artillery made occupation of the crest opposite Sniper Ridge too expensive in lives. The 1st FAOB’s assets were concentrated to assist the IX Corps’ artillery to neutralize this threat.\textsuperscript{36} The battalion’s success here is possibly a reason the Army deployed the 235th FAOB two months later. Unfortunately for United Nations forces, this addition came too late to make a front-wide difference in the enemy’s ability to use his artillery. Communist forces retained their ability to use their artillery to ever greater effect for the rest of the war.

Conclusions

The Korean War successfully tested and validated many of the changes the artillery made in target acquisition during the postwar era. The new procedures to call for fire were more simple, yet more accurate and efficient, as were the new adjustment procedures. Together these improvements are arguably the artillery’s most significant technical improvements of the postwar years. They also provided a basis for a common language by which all the services could call for fire. Increasing the number of forward observers so that every rifle company could have its own observer also worked well. Not only could an observer and his company get to work together

\textsuperscript{36} Lee, “Report of the 1st Field Artillery Observation Battalion,” 2; Report of the Artillery Observer Team, Tab 2; Hermes, Trace Tent and Fighting Front, 352.
constantly, but the observer acted as an informal liaison officer, allowing him to be the bottom rung of the fire support coordination ladder that had developed in the postwar years. This result was quite unintentional but effective. Finally, the observer's constant presence gave infantrymen the feeling that artillery was always close at hand. Observers demonstrated adaptability and innovation during the war, and performed their duties as the artillery's eyes well.

The progress made with the field artillery observation battalion was also impressive. The emphasis many artillerymen placed on radar technology in the postwar years is particularly notable. Radar in World War II had been employed only with great difficulty and with mixed results. In fiscally tight times such as those between 1945-1950 it would have been easier to push it to the side since there were other proven methods of target acquisition. Nevertheless, the artillery showed a willingness to experiment, and to go beyond the lessons of the last war in this area.

Unfortunately many of the post-World War II hopes for the observation battalion did not come to fruition. More correctly, they were not properly tested. General Ridgway in July 1951 requested two more observation battalions, but the Army deployed only one observation battalion to Korea for most of the war. The Eighth Army’s artillery officer cited the lack of observation battalions as one of the two major weaknesses in the field artillery in the Korean War. Ideally one observation battalion should have been assigned to each of the three corps artillery in Korea. This situation worsened when one considers that five corps was the normal requirement for a 150 mile front. The battalion’s ability to perform its mission was therefore severely
hammered because it was stretched too thin. It was not until January 1953, with the arrival of the 235th Field Artillery Observation Battalion that the situation was partially rectified. A third battalion was scheduled to arrive in August 1953, but by then the war was over.

There were probably two reasons for this crucial oversight. The first was the stringent troop levels imposed on the Far East Command (FECOM). This could have been bypassed by sacrificing two field artillery battalions. The second and more crucial reason was that even senior artillery officers in Korea were unfamiliar with the capabilities of the observation battalion. Although numerous FAOBs existed in active service during World War II they were dwarfed by the much larger number of other artillery units. One could achieve high command easily without having served with such a unit. Without knowing what officers learned in senior staff schools culpability cannot be assessed. The certain result, however, is that the observation battalion was underappreciated for most of the war and the artillery’s mission suffered as a result.

Given the troop ceilings, if the war had remained a mobile one it probably would have been best to use the manpower for firing battalions instead of one or two more observation battalions. Given the terrain and the difficulty the observation battalion had in a fast-moving situation, one can make a strong case that the manpower would have been better employed to crew howitzers that can fire than to man


38Rand, “Meet the FA Observation Battalion,” 24.
sound, flash, and radar positions which cannot keep up and usually are not much help. Once the situation stabilized, however, one or two less firing battalions would not have mattered much, but having one or two more observation battalions could have mattered a great deal. The General Board convened after World War Two explicitly stated that the observation battalion performed best during stabilized warfare. The loss of the firing battalions could have been made up in large part by slightly increased firing rates for the battalions which remained. Nothing, however, could make up for the absence of a full set of observation battalions. If the Army had deployed the required number of field artillery observation battalions, it would almost certainly have enhanced the artillery’s counterbattery program, increasing the artillery’s effectiveness per number of rounds fired.

Part of the measure of operational effectiveness is in maximizing one’s strengths. In this case, the Americans failed to press the one significant advantage they enjoyed over the Communist Forces—their technological edge in fire control. For a small gain, the artillery sacrificed much. It was the artillery’s most crucial and—since it stemmed from ignorance of one’s own capabilities—inexcusable error of the Korean War.

Although the lack of sufficient number of observation battalion’s was a severe impediment which should not have occurred, the artillery in Korea was well-served by the available human and electronic observation assets. The static situation which prevailed for the war’s last two years proved particularly conducive to target acquisition success. With the proper assets, however, much more could have been done.
CHAPTER III

THE FIRE SUPPORT COORDINATION CENTER

The tactical application of artillery firepower became increasingly complicated with the development of high-performance aircraft capable of delivering effective close support as well as the development of accurate long-range artillery and naval gunfire. The Second World War delivered home the lesson that coordinating artillery, close air support, and naval gunfire, collectively known as fire support, was now too large for the force commander to do himself. It was simply too difficult to have to deal with separate agencies for artillery, air, and naval support. Many times the task of coordinating all this fire power fell to the most logical choice—the artillery officer.\(^1\) Several artillery officers in the post-war period seized on this concept that one man should be responsible to the maneuver commander for all available fire support, and created for the Army the Fire Support Coordination Center (FSCC).\(^2\)

Its designers intended the FSCC to control the tactical application of fire power by coordinating the combination of field artillery, air support, and naval


\(^2\) The Navy and Marines had created a similar organization with the same name to provide integrated fire during amphibious landings during WWII. Although the Army used virtually the same concepts, the Navy’s contribution was not acknowledged in the many articles and presentations which I found.
gunfire. The artillery co-located the FSCC with the fire direction center. The two complimented each other well. The FSCC made the tactical decisions that ensured fire support was supporting the force (maneuver) commander’s plan. The FDC computed the technical data to implement the FSCC’s decisions. Soon after World War II units were testing the fire support coordination center in their training exercises.

The most notable exercise from the FSCC perspective was Operation SEMINOLE, a combined Army-Air Force-Navy amphibious exercise held in Florida between 2-7 November 1947. The Expeditionary Troops Artillery Officer organized the FSCC to provide “the ground force commander a means for controlling and coordinating artillery and naval gunfire and close air support, and for furnishing the most effective support, when needed, with minimum delay.”

Exercise SEMINOLE and others like it soon had many artillery officers contemplating the possibilities provided by the Fire Support Coordination Center. Articles about the FSCC or which mentioned the FSCC prominently began to appear in *The Field Artillery Journal*, the artillery branch’s professional magazine. Lieutenant Colonel Henry L. Shafer published an article in the July-August 1948 issue detailing his vision of a fire support coordination center. Quoting Napoleon’s maxim that God fights on the side with the best artillery, he argued that coordination of all fire support was essential to success in combat. Although he recognized there were many different opinions as to how this could best be accomplished, he believed that fire support coordination was a command function and that the artillery commander was the best

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choice to be the fire support coordinator. Colonel Shafer’s article shows just how far thinking on the FSCC had come. He used all the terms and described its organization almost exactly as it would be adopted over a year later. Another article which appeared in the same issue argued that the FSCC was the best way to integrate air support with army plans.4

Although these officers played their roles in the development of the FSCC, the driving force behind the FSCC was Colonel William D. Williams, the director of the Department of Training Literature & Visual Aids at the Artillery School. At the Artillery Conference held at Fort Sill, Oklahoma in December 1948, Colonel Williams reviewed as one of the conference presentations the status of a study titled Integrated Artillery Principles. Although in many ways Colonel Willam’s presentation was a step backwards from the ideas in Lieutenant Colonel Shafer’s article, he nevertheless retained the key principle—force commanders would need only to deal with the artillery commander for all their fire support.5

Colonel Williams spent much of 1949 working on a draft regulation governing the Fire Support Coordination Center. The Army published his final product as Training Circular No. 13, Principles of Fire Support Coordination, on 7 December 1949. Since it was a training circular and not a field manual, units were expected to follow its provisions as if it were doctrine and then submit comments about their


experiences. The training circular was only four pages, and at its heart was an unassuming paragraph which describes the makeup and function of the FSCC. The FSCC, it stated, "consists of a field artillery fire direction center, augmented by an antiaircraft liaison section, an air liaison section, . . and a naval gunfire liaison section, as required. Requests for artillery fire, naval gunfire, or attack by aircraft are coordinated with the FSCC prior to the decision as to which means will be" used. The Fire Support Coordination Center was now official, and its advocates saw in it the solutions to many of the command and coordination problems which plagued the employment of fire support in the Second World War.

The Fire Support Coordination Center in Korea

Since the training circular was hardly six months old at the onset of the Korean War, its provisions were not well known even to artillerymen, let alone to those outside the artillery community. Doctrinally the tactical air control parties, teams which directed close support aircraft to the target, should have attached themselves to the artillery commander, who would himself then establish an FSCC. In practice, however, the tactical air control parties initially attached themselves directly to the supported unit at regimental and division level as they had in the past. The results were not necessarily detrimental and often artillery and air strikes were employed in

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tandem against enemy positions. When this combination failed, however, friendly casualties were usually high.\textsuperscript{7}

The only time the FSCC seems to have been formed in the war’s early phases was when naval gunfire was involved. The FSCC concept was familiar to the navy. They had developed their own during the interwar years and used it successfully for amphibious operations during the Second World War. The Army’s first combat FSCC was probably the one established in July 1950 by Captain Harold Slater in a schoolhouse in Yongdok, on the east coast just north of Pusan, to coordinate the various types of fire support, including naval gunfire, for the 1st Cavalry Division fighting in Pohang-dong. The effective coordination of all this fire support helped the 1st Cavalry achieve the UN’s only success that month. North Korean prisoners revealed that the artillery gave them no rest, and that the North Korean 5th Division took 40\% casualties in the battle. Although Yongdok fell the next month, it was an auspicious beginning for the FSCC.\textsuperscript{8}

Gradually the concept of the FSCC began to spread from top to bottom. Early in the war there was an artillery officer on corp staff responsible for fire support coordination. Unfortunately his staff was small since the training circular had not

\textsuperscript{7}Appleman, \textit{South to the Naktong, North to the Yalu}, 90-91, 95-96, 376, 414. For examples of the artillery-air combination, see, for example, 368, 372, 374, 413, 484, 517-518, 551, 649; Mossman, \textit{Ebb and Flow}, 466, 467, 480.

\textsuperscript{8}Appleman, \textit{South to the Naktong, North to the Yalu}, 183-184, 187. Appleman refers to this as a Fire Direction Center. Although that term was informally used as the two were usually colocated when an FSCC was established, it is more correctly known as a Fire Support Coordination Center. An FSCC was also established during the retreat to and evacuation from Hungnam, which again required coordination with the navy. See Richard W. Stewart, \textit{Staff Operations: The X Corps in Korea, December 1950}, Combat Studies Institute (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1991), 44.
been accompanied by a change to provide more men and equipment with which to properly staff an FSCC. Within about a year FSCCs existed at all levels down to battalion. At such low levels FSCC concepts were usually implemented informally, again partially because no extra soldiers or equipment were authorized. At regimental level and above representatives from the air force and navy were present at most FSCCs. The army attempted to address many of the problems with the FSCCs reported by the units, and in August 1951 published Training Circular 23, *Coordination of Fire Support* to provide solutions.⁹

The new training circular more completely defined individual missions. The previous circular, for example, stated that the “artillery commander is charged with all command and special staff functions concerning fire support for the command.” The new circular was more direct. “Coordination of fire support is a command responsibility. Throughout the army, the artillery officer is an advisor to the commander on all fire support matters.”¹⁰ By elevating fire support coordination to a command responsibility the army was informing its artillery commanders to give this area their personal attention. Their role as artillery commanders now brought with it a role as the force commanders’ staff officer. The training circular specified that the artillery unit’s operations officer (S-3) and intelligence officer (S-2) would be added to the


¹⁰ Training Circular 13, 1; Training Circular 23, 1.
FSCC staff. The former, in addition to his standard fire direction functions, would now coordinate the artillery for his echelon. The latter, in addition to his normal duties, would develop information on those targets suitable for attack by air, missile, or long range artillery assets.\textsuperscript{11}

The most important change, however, was that which turned the FSCC from an ad hoc organization, created when air and naval assets made it necessary, to an organic part of the artillery unit’s fire direction center. Instead of simply processing fire support requests and assigning particular assets to accomplish assigned missions, the FSCC now “provide[d] the commander with coordinated advice and recommendations . . . both during the planning phase and during operations. [It p]rocess[d], plan[ned], and coordinate[d] fire support for those elements . . . which close[d] with the enemy [and] initiate[d] and direct[ed] additional fires when appropriate.”\textsuperscript{12} Unfortunately this increase in mission did not, like the first, come with any more soldiers or equipment. Nevertheless, the Army intended the FSCC to play a more significant role in planning missions and conducting operations.

Although knowledge of the FSCC’s function and purpose was not yet universal, more and more artillery officers were convinced of its utility. Articles continued to appear in the \textit{Combat Forces Journal}\textsuperscript{13} (which had replaced \textit{The Field Artillery Journal} as the artillery’s professional magazine). The improvements wrought in

\textsuperscript{11}Training Circular 23, 3-4.

\textsuperscript{12}Training Circular 13, 2; Training Circular 23, 2.

\textsuperscript{13}For example, see Powers and Wallace, “Fire Support Coordination Center” and Schaad, “Fire Support Coordination.”
combined operations by the FSCC were becoming increasingly apparent. Walter Herme’s assessment of the UN action on Big and Little Nori in December 1952 as an “excellent example of air, artillery, and tank co-ordination in support of the infantry,” for example, is indicative of this. Nevertheless, there were still problems, primarily one of location, and the army attempted to solve this with its May 1953 publication of Training Circular 9, also titled *Coordination of Fire Support*.

Though many advantages existed in co-locating the FSCC with the FDC, there was a strong feeling that this configuration did not give the force commander the proper control over the FSCC. Training Circular 9 changed the FSCC’s function from simply providing “the [force] commander with coordinated advice and recommendations” to “an operating agency of the supported force commander in which the representatives of the supported unit or force and the fire support agencies work together to plan and coordinate fire support.” The training circular recommended that the FSCC be established “within or immediately adjacent to the [force commander’s] command post,” and stated that the decision as to the FSCC’s location would be made by the force commander. This arrangement made it easier to coordinate maneuver and fire support, but it split the artillery commander between commanding his unit and being the fire support coordinator. It also required more equipment, since the Training Circular did not also provide authorization to acquire more equipment. In practice, the location varied from unit to unit with no particular location dominating, at least at

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regimental level. But the FSCC was evolving from being primarily the artillery commander’s agency to becoming the force commander’s agency for coordinating the combined arms team.

Conclusions

The fire support coordination center was the greatest tactical improvement in the artillery after World War Two. The problem of coordinating artillery and maneuver had grown increasingly difficult with technology’s advance. At a stroke, the FSCC concept reigned in these disparate sources of fire support and provided a military solution by making them answerable to one man—the artillery officer. He, in turn, answered to the force commander on behalf of all fire support. Though problems existed early in the Korean War in implementing the doctrine, it was still in the early stages of dissemination when the war started. If the war had started later, it is likely that the problems would have been reduced. Given the pressures of the war’s first year, artillerymen could not afford to consider something which few knew about, even fewer understood, and for which no separate equipment or personnel had been authorized. Nevertheless, the foundation had been laid in the postwar period and fire support would never again be the same.

With the onset of stabilized warfare, the time to “sort it out” arrived. Like the observation battalion, the FSCC clearly operated best during the stabilized phase. The FSCC provided the coordination necessary. Some problems that continued through

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the war, however, including the failure to properly screen targets to determine the best means of attack, the failure to provide the necessary personnel and equipment to make it more effective, and the tendency late in the war to overplan, creating so many targets as to be detrimental. Observers rarely plotted all these targets, because if they had done so, their maps would have been unreadable. The FSCC did, on the other hand, contribute to breaking down the communication barriers between the infantry and armor and their fire support agencies. With it the US Army made significant strides in combined arms warfare by making fire support more responsive to the force commander's desires. Finally, in an era which witnessed bitter inter-service rivalry at the highest levels, the FSCC established an arena in which the Army, Air Force, and Navy (usually) worked closely together to provide the best fire support possible. Its enduring significance is that it combined fires from all services. Combined arms warfare took a giant step forward as a result. The fire support coordination center's success in the Korean War ensured it a permanent place in the post-Korean War army, and it remains over forty years later an important component of the combined arms team.

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CONCLUSIONS

Having examined some of the principal field artillery organizations and their performance in the Korean War, we return to the two questions asked at the outset. What effect did the application of fire power have on the ability of the United States to conduct a limited war in Korea and how well did the field artillery institutionally respond to the lessons of the Second World War and the Korean War? The answer to the first is largely contained in the introduction. The field artillery largely offset the superior manpower resources the Communist forces mustered against the United Nation’s forces deployed to Korea. The field artillery could have done better, and could not have done it alone. U.S. firepower, for example, contributed at least as much if not more to offsetting the U.N.’s manpower disadvantage. Airpower was a scarce resource, however, and one that could not be used during poor weather. The field artillery could always assist and at an operational and tactical level was largely effective. Time and again artillery fire broke up large scale enemy attacks which otherwise would often have succeeded or been repulsed only with the large loss of American lives. Had American casualties been significantly higher, the domestic political cost of maintaining the war in Korea might have become too high. True to what has been the American way of war since the resource-rich North defeated the
resource-poor South in the American Civil War, the artillery became a principal means by which the United States applied the fruits of its vast resources against the resource-poor Communist forces.

The most important tactical improvement before and during the Korean War was undoubtedly the creation of the fire support coordination center. This organization greatly simplified the growing complexity of the fire support available to the maneuver commander. Although the artillery was less than generous in acknowledging the navy's contribution to the FSCC's development, it refined these concepts in peacetime to suit them. Its success in the Korean War ensured its permanent place in the post-Korean War army.

The most important technical improvement was probably the post-war changes in forward observer technique. These new procedures had received strong encouragement from Major General Clift Andrus, the artillery school's commandant from 1946-1949. As a result these procedures were largely institutionalized before the Korean War began. Although there were some initial training problems, these were quickly overcome. The addition of observers attached to supported units on a permanent basis also increased the artillery's ability to support the maneuver forces more effectively. The Korean War proved the effectiveness of these measures, and demonstrated the vitality of some of the post-World War II thinking in the artillery community.

The new ammunition system had also worked well once the logistic situation improved. The continuous refill system instituted an effective two-way communication system which allowed subordinate units to make estimates to their superiors;
higher commands could then inform subordinate units how much ammunition they
would be allowed to consume. The stories concerning ammunition shortages in the
war are just stories. They tell us much of the boredom produced by a stable combat
situation, but little about the ammunition situation as it actually existed.

There were serious flaws, however, in the artillery’s preparation for war. The
most costly was the post-war neglect of perimeter defense. The widespread neglect of
this area resulted from the narrow focus on a particular kind of war in a particular
location. This neglect proved costly in terms of lives and equipment. Although many
officers quickly adapted, many did not. Fortunately, this neglect was not repeated
after the Korean War.

The failure to properly employ the field artillery observation battalion against
an enemy whose artillery continued to be more effective as the war went on was
another conspicuous failure. The failure by senior artillery officers to understand
and/or appreciate just what properly employed observation battalions could have done
for them demonstrates a lack of understanding of friendly capabilities. Even with the
troops limitations, the artillery would have been far better served with the addition of
two additional observation battalions than it would have been deprived with the loss
of two firing battalions in their place. By the time senior leaders recognized the
potential usefulness of the observation battalion, the war was nearly over.

As with the Second World War, the artillery’s ability to learn its wartime
lessons and make the requisite improvement was mixed after the Korean War, but it
was better. The most important improvement was the institutionalization of the fire support concept, largely made possible with the creation of the fire support coordination center. Although as many pointed out, the principles had been around for many years, the act of consolidation and clarification was no insignificant accomplishment. The Field Manual 6-20, the artillery's capstone manual, incorporated the lessons gained from Korea, and closely resembles Training Circular 9, the last training circular issued on the subject. The pre-Korean War manual hardly mentioned fire support coordination. After the war, fire support coordination gained its own chapter. "Fire support is the most flexible and one of the principle resources available to . . . influence[e] the outcome of the battle. The effectiveness with which . . . this resource [is employed] in support of [t]his plan . . . may be decisive."

1 The fire support concept further entrenched itself into army doctrine with the 1954 revision of the Field Manual 100-5, the army's capstone manual on operations. The six pages allocated to the fire support concept may not seem much, but it was one of the longest of all the nearly eighty subchapters.2 This advance in combined arms operations was largely possible because of the fire support coordination center's success in the Korea War.

The artillery continued to experiment with radar after the Korean War. If World War Two can be considered the birth of artillery radar then the Korean War can be considered its early childhood. It had been a difficult childhood, and many

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1Department of the Army, Field Manual 6-20 Artillery Tactics and Technique (Washington, D.C., October 1953), 159.

probably were tempted to forget the whole thing. There was considerably less mention of radar among artillersmen after the Korean War than after the Second World War. Nevertheless radar advocates persisted. Radar eventually became a very sophisticated means of target acquisition, and eventually completely replaced the sound and flash teams. The effort so many artillersmen put into technology which did not produce results for so long also reveals the far-sighted qualities in the artillers community.

Perimeter defense did not suffer from neglect after the Korean War as it had after the Second World War. The appropriate passage from the first manual published after the war is interesting and worth quoting at length.

Artillery units must be able to engage in close combat to accomplish their mission. Attacs against artillery can be expected and must be resisted. The role of field artillery is to give fire support to infantry and armor. Artillery will not withdraw from a position or fail to render fire support because of a threat or an attack by hostile forces except as part of a planned withdrawal . . . . The prime tradition of artillery is to always defend its guns.3

The manual went on to note that field artillery batteries may be subjected to “ground attacks by small infiltrating parties or guerrillas” and that “an all-round, completely integrated defense system is essential for the defense of the battery.”4 Whether perimeter defense went neglected in training or not cannot be ascertained from the manuals. It was now possible, however, for diligent artillersmen to learn more about the importance of perimeter defense than they could have before.


4The Field Artillery Battery, 83,71.
The artillery also improved, doctrinally at least, in high angle fire procedures. High angle fire received its due space in the artillery's fire direction manual, the Field Manual 6-40. Unlike perimeter defense, it was not as important that this particularly skill be practiced. What was important was that fire direction officers could now easily find the procedures they would require to calculate such fire in the appropriate manual.

The most significant failure to learn the Korean War's lessons was in the area of weapon's design. Everyone agreed that a howitzer with the ability to traverse 360 degrees was needed. The need for howitzers that could elevate past 65 degrees, however, was less obvious to many, although it should have been very apparent. At the 1954 artillery conference Major General Lyle Lemnitzer, the Deputy Chief of Staff for Plans and Research, stated in a letter read to the conferees that the artillery needed to "retain" its high angle capability. Lemnitzer noted that "high angle fire was employed with great effect in the terrain conditions imposed in Italy, the South Pacific and in Korea."5 Despite this pitch for high angle fire and the stated design characteristic for a howitzer with an elevation through 75 degrees, the artillerymen charged with overseeing and evaluating designs were convinced that 65 degrees would be better because a piece with 75 degrees elevation capabilities would have to be several inches higher. Lemnitzer correctly noted that high angle fire had been fired with great effect, but he had only touched upon the difficulties associated with firing such missions. The conferees spent almost as much time discussing the virtue of

gaining two more degrees in *depression* (from -8 to -10) than they did discussing the ten degrees of elevation. The conference might have benefited from artillerymen more familiar with the technical difficulties of firing high angle missions.\(^6\)

Despite this last failure, the artillery’s success in the Korean War vindicated the testimony of many officers who believed that artillery doctrine was basically sound. In war and peace, artillerymen showed thought, innovation, and competence in most areas. There were significant failures, but they were outweighed by many successes. The last two years of the Korean War were truly an artilleryman’s war, and the artillery fought it well. Many of the tactics and techniques the artillerymen of that era developed and instituted, such as the target-grid method of fire, the fire support coordination center, and radar, remain with us today, a testimony to their enduring legacy. The names are largely forgotten, but their actions helped the United States to end the Korean War on favorable terms and to emerge from it strong enough to fight a Cold War with no foreseeable end. Their performance and success is another favorable chapter in the history of the U.S. Army’s field artillery.

\(^6\)Transcript, 1954 Artillery Conference, 13, 47-49.
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MSL Morris Swett Library, U.S. Army Field Artillery School
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