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TASK ORGANIZING FOR URBAN COMBAT

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A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

J. M. CAMPBELL, MAJ, USA
B.S., South Dakota School of Mines, 1964
M.C.S., Texas A & M University, 1970

Fort Leavenworth, Kansas
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This study presents guidelines on task organizing for urban combat. Eighteen examples of World War II urban combat were used to determine quantitative guidelines for planning a force of infantry, armor, engineers and artillery to be used in urban terrain varying from a small village to a large city.

Each historical example is first viewed in synopsis form describing the battle. The task organization used is then presented. Conclusions about the task organization are stated for each historical example.

The quantitative data on task organizatio and urban population are then tabulated and plotted versus each other. Graphs depicting the ratio of armor to infantry, engineer to infantry and artillery to infantry are displayed. Further analysis is presented on the ratio of these forces as part of a total maneuver force.

A methodology is presented to permit the task organizer to structure a force for any type of urban terrain with the proper number of engineers, artillery and armor units for a given infantry force.

Task Organizing for Urban Combat

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CHAPTER 1

PREFACE

Several apparent paradoxes exist in current military philosophy and planning. While a majority of US Army Officers feel that the most likely war in the next decade will be a counterinsurgency conflict, the US Army is planning, training and equipping for a major nonnuclear war in Western Europe.

A 1975 survey concluded that only twenty-three percent of US Army Officers felt that a major nonnuclear war was a possibility during the next decade.[1] The capstone manual of the US Army's "How to Fight" series focuses attention on preparing for "a battle in Central Europe against forces of the Warsaw Pact."[2] This battle is envisioned to be of short duration, high intensity and very attritive.

The foregoing paradox suggests another one. While this modern battle scenario is envisioned, the terrain of Western Europe has changed. The impact of over three decades of urbanization has dramatically decreased the open areas. Yet, the sweeping armor envelopments of World War II still appear to be in the planner's mind.

During World War II, the population density of what is now the Federal Republic of Germany, was 166 persons per square kilometer. In 1976, the population density for this same area was 253 persons per square kilometer.[3] This population growth represents a two-thirds increase in just thirty-five years. As a reference point, the population density, in persons per square kilometer, of the United States is 23;

New York State is 141, and 360 occupy New Jersey.[4]

This high population density in Germany, is reflected in a typical brigade sector in central Germany. A representative sector has a defensive front of approximately twenty-five kilometers. In that brigade sector, about sixty percent of the area is villages and forests. There are an average of eighty-five villages in the sector.[5] The close physical proximity of these villages, spaced between 2000 to 4000 meters apart, poses a challenge for the attacker.[6]

This 2000 to 4000 meters distance between villages is well within the range of current antitank missiles. The technology of the antitank weapon systems coupled with the village spacing, permits little opportunity for an attacker to bypass villages without being exposed to flanking fires.

The countryside in the forward defense area is not the only area growing in Europe today. There are currently ten major urban areas or conurbations that have a population exceeding 500,000 within Germany.[7] These urban areas are beginning to fuse together into a large urban maze. This growth is occurring across national boundaries as well. The Dutch Randstad and the German Rhine-Ruhr areas are beginning to fuse. It is projected that in the 1980s, an urban area over 300 kilometers long will exist from Bonn, Germany, to the Hook of Holland. Figure 1 portrays these urban concentrations in Germany and her neighbors.

This urban growth has created yet a third paradox. The question of whether urban growth has created or simplified problems for an attacker is widely discussed. One author suggests that to be bogged down in a city would be incompatible with the Soviet military style.[8] Another author notes that current Soviet teaching stresses the "need to avoid

Figure 1. German Urban Concentrations (Source: Paul Bracken, "Urban Sprawl and NATO Defense," Military Review, October 1977, p. 35.

engaging in battles in town wherever possible."[9] Another author states that an urban defense might risk escalation of a war because the city would be a good nuclear target. He posed the perplexing dilemma: "urban defense may deter conventional attack; nuclear attack may deter urban defense."[10]

The fourth paradox now becomes apparent. While the chance of a combat engagement in urban terrain appears probable in Western Europe, the leaders and national policy of those countries avoid planning or mentioning the chance of such warfare. There appears to be a widespread aversion on the part of military planners and politicians to face this issue.[11]

These paradoxes provide considerable discussion topics for military planners. This thesis, however, will not examine them further but accepts the tenet suggested by them, that in the future, there will be occasions for the US Army to fight in urban terrain. Accordingly, the US Army must be prepared for that challenge.

Winning the Battle

Four prerequisites are required by the FM 100-5 doctrine to win in battle.[12] First, adequate forces and weapons must be concentrated at the critical times and places. The Generals commanding corps and divisions have been tasked with this mission.

Secondly, the battle must be controlled and directed so that the maximum effect of fire and maneuver is concentrated at decisive locations. The Colonels commanding brigades and Lieutenant Colonels commanding battalions are tasked to control the battle. Part of this requirement is described in FM 100-5 as the task to "fit the forces to the ground."[13]

Thirdly, the battle must be fought using [illegible], combined fire suppression and combined arms teamwork to maximize the effectiveness of our weapons and to minimize the effectiveness of enemy weapons. Captains and their companies are tasked with this prerequisite.

Finally, the teams and crews must be trained to use the maximum capabilities of their weapons. The captains bear the prime responsibility in this train, but commanders at all levels must allocate resources for this training.

Literature Review

For the US Army to accomplish the prerequisites for winning battles, it must have the training, equipment and doctrine in peacetime to insure success in war.

A review of the "How to Fight" manuals was conducted to determine if sufficient guidance is provided to the Generals, Colonels and Captains on how to fight their battle in an urban environment. A complete list of this manual series is listed in Appendix B, FM 100-5.

The duties of the Generals are well covered. Doctrine is replete with methods of maneuver and concentration principles. An ample supply of historical campaigns illustrate these principles for the Generals.

Similarly, the Captain is virtually inundated with the details of small unit tactics and methods to be used in street fighting at the squad, platoon and company level.

Doctrine is not so explicit in providing the Colonels and Lieutenant Colonels guidance on how to "fit their forces to the ground." The capstone manual, FM 100-5, notes that "direct fire weapons such as self-propelled artillery, combat engineer vehicles and tanks will be

required to overcome or suppress strongpoints. This is the basis for the belief that combined arms task forces will be needed for urban fighting. No further explicit guidance provides rules for task organizing a force for urban combat.

FM 17-95, Cavalry, states that "if an armored cavalry squad or platoon must fight in a large city, it should be reinforced with infantry."[16] Engineer Combat Operations, FM 5-100, states that "MOBA requires small unit tactics. Engineer squad size task forces may be attached to infantry forces. Tailor them carefully."[17] FM 71-100, Brigade and Division Operations, provides the best guidance when it states the need for increased engineers in urban terrain and also mentions that tanks must have increased infantry support.[18] All the other manuals in this series provide only general information on urban growth, classification and characteristics but little information on how to task organize a combined arms team to operate in an urban environment.

FM 90-10 (Draft), Military Operations in Built-up Areas, provides a summary of the information provided in the appendices of the other "How to Fight" manuals. This manual also provides no quantitative guidance on what mix of units to use in various urban environments.

This paucity of task organizing guidance creates a problem for the Colonels and Lieutenant Colonels who must fit their forces to the terrain. To solve this problem, a quick, simple and historically reliable method for task organizing a force for urban combat should be developed.

Thesis Statement

The thesis of this research project is that historical examples can be used to develop a method of task organizing a force for combat

in various urban environments. Thus, it [illegible] force mixes or ratios, i.e., the relation of infantry, armor, engineers and artillery to each other in a task force in Western [illegible] urban environment can be determined from the use of historical [illegible].

Thesis Content

The end product of this thesis will be a quick, reliable method for the commander to use to task organize his force for combat in a variety of urban settings.

Towards this end, Chapter 1 has demonstrated the need for original work to solve the problem of providing task organizing guidelines for the commander.

Chapter 2 defines the urban setting. A task force will be required to fight in a variety of urban terrain. The key variant in urban terrain is the area's size. This size is usually determined by the population. Other factors such as the degree of urban planning, the industrial and transportation systems and the age also have a role in determining the town's size, but population is the thread that ties these different variants together. The population size then determines type, density and location of the structures within the urban setting. Two commonly used classification systems are discussed in Chapter 2 in sufficient detail to permit the urban areas of Western Europe to be classified for later reference in the task organization method.

Chapter 3 presents a synopsis of eighteen combat engagements on urban terrain in World War II. German, Soviet, United States, Canadian and Japanese forces were involved in these engagements. The eighteen combat locations provided twenty-three sets of data involving urban

warfare. These twenty-three sets of data are used for the analysis of Chapter 4. The focus of the historical actions is on their task organization. The noteworthy points of this task organization are stated in the words of either a senior commander present at the battle or else from his staff in an after action report. Some subjective judgments on the validity of selected engagements are offered to aid the reader in evaluating the data analysis in Chapter 4. These comments are set off in a box at the end of selected subheadings. All other writings in Chapter 3 are from historical sources with no intentional bias or comments provided by this thesis.

Chapter 4 correlates the twenty-three sets of data provided in Chapter 3. Graphs and tables are used to determine trends and conclusions. The end result of the thesis is presented in chapter 4. The developed guidelines that can be used by a commander to task organize a force for combat on urban terrain, ranging from a small village of 1000 persons to a large city of one million inhabitants, are listed in table format for easy reference.

Appendix A is provided as a source for footnotes. Footnotes are arranged by chapter for both ease of reference and ease of reading the basic text.

CHAPTER 2

URBAN CLASSIFICATIONS

The word terrain is common to military terminology. Terrain is merely the ground we walk on. It can have many varieties, however. It can be smooth, hilly, wet, dry, hot, frozen, swampy or muddy; or, it can have manmade features such as roads, bridges and buildings. When many structures are placed on the ground, the area is referred to as urban terrain. The more structures per unit of area, the more dense and urbanized the terrain.

There are two systems commonly used by military forces to classify the type of urban environment. Both of these classification methods are based on population. The two systems are the US method described in FM 90-10 (Draft), and the Soviet System described by several authors in open literature.

Soviet System

The Soviets describe a built-up area in terms of its population and its perimeter. Depending on these two variables, it is classified as small, average or large. Table 1 portrays this system.

POPULATION	PERIMETER	CLASSIFICATION
Less than 50,000	Less than 15 Kms	Small
50,000 to 100,000	15 Kms to 25 Kms	Average
More than 100,000	More than 25 Kms	Large

Table 1. Soviet Urban Classification System[1]

US Urban Classification System

US Army doctrine defines four types of urban areas. These are described in table 2.

DESCRIPTION	OPERATIONAL LEVEL	CLASSIFICATION
Population less than 3,000	Company/Battalion	Village
Generally built-up area between towns and villages along roads. Can approximate a fortified area in cross-compartment operations. Very common in Europe. More open area than WW II construction.	Company/Battalion	Strip Area
Population between 3,000 and 100,000. Not a part or political subdivision of large urban complex. Has definable limits.	Brigade/Division	Town and Small Cities
Population over 100,000 up to millions. Covers 100 square miles or more. Population density exceeds 1000 per square mile.	Division/Corps	Large City

Table 2. US Urban Classification System[2]

These two classification systems are used in describing the size of historical urban engagements presented in this thesis. By knowing the urban size or population, it can be classified for further use in determining how to task organize a force for combat in that urban environment.

CHAPTER 3

HISTORICAL EXAMPLES OF TASK ORGANIZATION

Eighteen combat engagements from World War II that occurred in terrain of varying urbanization are examined in this chapter. Nine examples of Soviet and German task organization employed in urban combat ranging from small scale actions to the major engagements of Stalingrad and Berlin are presented to develop the evolution of Soviet task organization for urban combat. The Canadian experiences at Ortona, Italy in late 1943 proved to be the foundation of evolving British and US urban warfare doctrine and organization. The final eight combat engagements involve US forces against both Japanese and German forces. The central theme in all the combat episodes is to portray a general scenario of the combat actions and then to state the task organization that was found most beneficial by the combatants. If certain problems were found to exist in these task organizations, then the recommendations of the original combatants is presented. This chapter is primarily to relate historical combat engagements. However, for analysis purposes, a subjective appraisal of various points in selected episodes is included as commentary in a box at the end of certain subchapters. This summary will permit the reader to apply the proper weighting to various factors used in the analysis portions of chapter 4. All writings not in a box, are the narration of history and are presented in an objective and unbiased method as possible.

For ease of reference, a numbering system is presented which will permit the quick association of combat engagements to points on

the graphs of chapter 4. These numbers are presented in parentheses adjacent to the subchapter title headings. Additionally, maps are provided within the chapter that depict an approximate location for the selected combat engagements.

EVOLUTION OF EASTERN FRONT URBAN WARFARE
(German-Soviet Actions 1941-45)

The evolution of urban warfare tactics on the Eastern Front can be recognized as including three distinct periods.[1] The Early Period occurred during the summer and autumn campaigns of 1941. The German strategy of quick and rapid encirclement precluded towns and villages from playing any major role. With the exceptions of Minsk and Smolensk, the Soviets abandoned all towns prior to German contact.

The Middle Period includes 1942 and early 1943. This period of urban warfare evolution included the transition of Soviet combat from the defensive to the offensive mode. During the early part of this period, from January 1942 until April of that same year, the Germans were able to stem Soviet advances by using towns and villages in their defensive plans. The exceptionally cold winter and deep snows of that year precluded attempts to bypass and isolate the towns. The German defense scheme included an all-around defense that employed field fortifications, minefields and antitank obstacles located in depth around the towns. All these obstacles and positions were well covered by direct fire. Within the towns themselves, the centers of resistance were sited in the central sectors and fully integrated with other centers into mutually supporting strongholds. Antitank weapons were placed on the outskirts of the towns to catch attacking forces in the open approaching the town. A combined arms approach was used in combining all elements

in defense plans. Vigorous counterattacks would occur when positions were captured in the hope of retaking the position prior to Soviet consolidation.

The Soviet attack methods against these towns also stressed the combined arms approach. Rather than bypassing and isolating the towns, Soviet doctrine stressed leaving escape avenues open to the defenders. Doctrine stressed the prime prerequisite of thorough reconnaissance to determine the defenders plans. The next step was to conduct reconnaissance by fire to complete the location of all enemy positions. Feints were used and a distinct preference was exhibited towards night attacks in order to avoid the antitank weapons sited on the outskirts of the town. Soviets used tanks sparingly. When they were used, they were to fix the defender rather than to rush and overwhelm him. Artillery barrages were discouraged and artillery began to be used as direct fire weapons in the towns. Units began to be organized into assault groups to attack successive strongholds. The German dislike of hand to hand combat was noted in that if one floor was captured, usually, the rest of the building would quickly follow.[2]

The next phase of the Middle Period spanned from August to November of 1942. It was during this period that the Soviet High Command dictated that all villages, towns and cities would be defended street by street and building by building. This policy stemmed the rapid German advances of July and August of 1942. The German method of attacking towns during this period was characteristic of a blitz attack. They tried to disorganize the defenders by massive aerial and artillery bombardments. These bombardments were followed by massed tank attacks. The Soviet response to these blitz attacks was to place their antitank weapons in

depth on the approaches to the town. They realized the importance of rubble to the defender and began the use of snipers, especially to kill officers.[3] The use of small, limited objective counterattacks, especially at night, to disrupt the supply movements was practiced.[4]

The final phase of the Middle Period ended at Stalingrad in February 1943. During this phase, no new tactics were practiced. The major innovation of this era was the increased intensity, scope and ferocity of the fighting compared to previous months.[5] The German blitz tactics of massive and continuous bombardment was applied with total devastation to the city. The Soviets used massed artillery to break the massed German attacks. In their attacks, the Soviets used combined arms teams of armor, infantry, engineers and air to lead. In the final German advances, they abandoned massed tank attacks and began to use small infantry-engineer teams combined with flame throwers. Stalingrad proved that the "ruins of a city constitute one of the most formitable types of fortifications in modern war."[6]

The Final Period of urban warfare evolution on the Eastern Front included the perfection of urban warfare as practiced by the Soviets. Their doctrine evolved by General Chuikov, in the rubble of Stalingrad, was honed and used to perfection in the Soviet march back across their territory and into Germany. The culmination of their efforts came in Berlin where their preponderance of weapons systems still provided opportunities to learn new urban warfare lessons.

SEVASTOPOL (1)

The combat actions around Sevastopol during the period 7 June to 4 July 1942, provides an insight into the payoff to the German Army

for their doctrinal development of the combined arms assault techniques during the 1935-39 training period. See figure 4, page 42 for location.

In November 1941, General von Manstein's 11th German Army breached the Soviet defense lines along the northern portion of the Crimean Peninsula. During his advance, several Soviet divisions withdrew behind the Sevastopol lines. Early in December 1941, the bulk of the 11th German Army turned westward from Kerch, on the western peninsula, and focused their attention on Sevastopol.

From December 1941 until June 1942, the German actions against Sevastopol were minor. The Soviets used their maritime advantage to launch several counterattacks across the Black Sea to the western peninsula. They also conducted guerilla warfare actions against von Manstein's supply routes.

Sevastopol was a fortress city. The surrounding terrain included steep hills and deep ravines. Vegetation was scarce. The defensive system included nineteen modern concrete forts, 3597 pillboxes and many lesser defenses were arranged in three defensive belts.[8] The outer belt was two miles thick with four sets of trenches and a thick belt of antitank mines. The second belt was a mile deep with fortifications using twelve inch batteries. The inner belt was immediately adjacent to the town.[9]

An artillery preparation began at 0300 on 2 June and continued until 7 June. This barrage was so effective that it cut off supplies from reaching the outer defensive belt.[10] The German plan was to attack from the north with the main attack and to conduct a secondary attack in the southeastern sector. As the German infantry moved forward on 8 June, it became rapidly apparent that further artillery and air bombardment would be needed before the forts could be stormed.

The beginning of the end came on 18 June when the Germans finally captured Fort Maki Gorki. This permitted access to the harbor and direct firing on other forts and Sevastopol itself.

On the night of 28-29 June, the Germans launched an amphibious assault under cover of darkness and smoke concentrations. Just as in 1855, this seige ended with the capture of Fort Malakhoff. The town was occupied.

The German attackers suffered 4,337 men killed, 1,591 men missing and 18,183 men wounded. The Rumanians, Germany's ally, suffered 2,500 men killed, missing and wounded. Soviet losses were over 100,000 men and considerable amounts of war materiel.[11]

Sevastopol was actually an attack on a fortified position rather than an urban engagement. It is cited, however, because it was the testing ground for the German assault tactics used elsewhere. These tactics included the use of infantry, antiaircraft artillery (in a direct fire role) and other elements whose mission it was to place the engineer component into a position where the engineers could directly apply their explosives to the enemy positions.[12] "The use of engineers, and engineer materials and weapons, in this strictly combat capacity is the distinguishing characteristic of the German assault techniques."[13]

Because Sevastopol is an example of an assault on a fortified position with minimal urban combat, it will have limited analysis potential in chapter 4. It does, however, illustrate the historical necessity of combined arms teams and the value placed on engineers in this type of operation.

STALINGRAD (2,3)

Stalingrad was the costliest and perhaps most famous city battle in military history.[14] It demonstrated urban terrain effects on the attacker and was the founding ground for much of the urban warfare doctrine practiced during the war not only by the Soviets but by the Allies as well.

Initially, Hitler's strategy was economic. He wanted to cut the Volga River shipments of wheat, oil and minerals trickling to the north. The point selected for this interdiction was Stalingrad.[15] The long and protracted fighting that lasted from August 1942 to February 1943 altered the motives for the engagement to political rather than economic.

Stalingrad is located 550 miles southeast of Moscow on a thirty-five mile wide section of land located between the Don River on the west and the Volga River to the east. Stalingrad is located on the western bank of the Volga and spreads thirty-five miles north to south but was only two and one-half miles wide at its widest point in 1942.[16] There were 400,000 residents in this major industrial complex prior to the start of hostilities.[17] The industrial output of Stalingrad contributed significantly to the war effort of the Soviet Union.[18]

The Battle

On 21 August 1942, elements of the German 6th Army, commanded by General Paulus, began crossing the Don River. Soviet resistance was relatively light.[19] By 13 September, the Germans had forged a ring around eight Soviet divisions of the 62nd Army commanded by General Chuikov. This ring was roughly semicircular with a concave side fifteen miles long and six miles deep and was bounded to the rear by the Volga.[20]

On 14 September, the Germans attempted to drive a wedge into the center of Stalingrad. As the Germans pushed further into the city, the Soviet defenses stiffened. By 1 October, the Soviet perimeter had been reduced to about fifteen miles long but only one and one-half miles wide.[21]

By the end of October, the Germans had reached their furthest penetrations. The Soviets retained only four bridgeheads west of the Volga. The largest was in the center of the city and measured four miles east to west and only one mile in width.[22] On 11 November, the Germans made a final push to eliminate the bridgeheads but had negligible results.[23]

Up to this phase of the war, the Germans had relied on command of the air, superiority in techniques and a history of success.[24] Several factors combined to halt this string of successes. The Germans had failed to complete the encirclement of Stalingrad by crossing the one and one-half mile wide, rapidly flowing, Volga River and cutting off the flow of supplies. Perhaps the major advantage provided to the Soviets was the ability to provide artillery support from the east bank of the Volga without having to worry about the considerable supply problems if the weapons were sited west of the river. As many as 100 large caliber guns per kilometer provided constant artillery support from the east bank.[25] The Soviet artillery was the backbone of the Stalingrad defense.

Perhaps the major reason for the protracted Stalingrad struggle was Hitler's determination to take the city and Stalin's equal determination to retain the city named after him.[26] These obsessions blinded both sides to the tactical and strategic consequences.[27] Hitler ordered Stalingrad reduced by artillery fire and air bombardment followed by a

steady advance by ground troops.[28] This, however, did not work. General Talensky, a Soviet General, is quoted by General von Mellenthin that "bombing...only tended to create new shelters."[29] The German effort so far, until mid November, had cost sixty thousand men and over five hundred tanks.[30]

The second phase of Stalingrad began on the morning of 19 November when the Soviet Southwestern and Don Fronts began an offensive to encircle the German 6th Army. On 20 November, the Soviet Stalingrad Front attacked in a westerly direction. By 22 November, despite German corps-sized counterattacks, the encirclement was completed. Twenty-two German divisions and two Rumanian divisions, nearly 270,000 men, were trapped in the circle.[31]

From 12 to 24 December, the German Army Group Hoth, spearheaded by the 57th Panzer Corps, attempted to breakthrough to relieve the 6th Army. This attempt reached only to within forty-five miles of the center of the city or about thirty miles from the 6th Army lines.[32] By 1 January, the Germans had given up all hope of breaking through to the 6th Army.[33] They were then located in a pocket thirty-seven miles deep (east to west) and twenty-five miles wide.[34]

On 10 January 1943, the Soviets launched another attack to destroy the pocket. By 19 January, the pocket was reduced by 86% in area.[35] On 23 January, the last usable airfield was lost and by 26 January, the German force had been split into two small isolated pockets.[36] On 31 January, the 6th Army surrendered.[37] On 2 February, the last pocket of the IX Corps surrendered.[38]

Exact estimates of the losses are difficult to determine. Various German and Soviet sources give differing estimates. Perhaps the

best figures available indicate that of the 270,000 men originally encircled, 42,000 were flown out due to wounds or critically needed skills.[39] Ninety-one thousand were taken prisoner.[40] The remaining 137,000 were either killed or missing. Of those taken prisoner, only 5,000 remained alive at the end of the war.[41] Whatever the exact figures, the loss of these combat veterans and their material critically altered the balance of power on the eastern front for the remainder of the war.

Task Organization

German tactics and organization used initially in the city fighting were characterized by the massive use of firepower and bombardment. All this firepower, however, had diminishing returns because the Soviets did not yield territory without being physically eliminated.[42] The favorite German tactics of envelopment, pincer movements and sudden panzer thrusts had lost their usual ability to achieve victory in the close combat of Stalingrad.[43]

In their successful effort to cut the Soviet positions into four small bridgeheads in October, the Germans had been successful at using a task organization with many engineers attached to the forward units. A German article noted that"engineers were placed with each regiment and battalion...It had become axiomatic that they were to be found in the center of every action."[44] The Germans also task organized into small combined arms assault detachments.[45] In another instance, six German divisions were reinforced with five engineer battalions to achieve success in the bridgehead reduction.[46] Other special engineer assault demolition teams penetrated to the Volga in limited instances.[47]

An indication of the steamroller and bludgeon tactics is the German use of three infantry and two panzer divisions on a three mile

front in their final attack on the Red October Tractor Factory on 13 October. This one and one-quarter mile deep assault took eighteen hours and left three thousand dead.[48]

German doctrine stated that tanks should not be brought into cities.[49] This was changed. The Germans began to hold their tanks in mass in rear areas and then committing them in groups of three to five down one street. The infantry preceeded the tanks and once the route was cleared, the tanks advanced. The infantry commander was located near the tanks and depended upon radio rather than wire or messenger for their control.[50]

The annals of war have recorded the names of the Stalingrad defenders not only at Stalingrad but throughout the campaigns across Eastern Europe. Perhaps the greatest name linked with Stalingrad is Vasili Ivanovich Chuikov. As commander of the 62nd Army, later renamed the 8th Guards Army, he led the Stalingrad defense, the subsequent offense and then began a march across Eastern Europe. He crossed Poland, captured the citadel at Poznan and finished the war in Berlin. He can be called the father of modern city fighting. Stalingrad served as the school for the important lessons in street fighting. As Chuikov has said, "the art of street fighting did not spring into existence fully formed, we perfected it; every soldier tried to devise, and did devise, new and unusually successful ways of fighting."[51] His contribution to warfare was the creation of shock groups. He described them as follows:

> "The men of Stalingrad were called upon to make a major contribution to the military art of urban defense. The defenders of Stalingrad created shock groups of a peculiar type for street fighting. Here there is no opportunity for offensive operations by large units. Here it is the small infantry group that dominates the scene. The small infantry group is best adapted for taking single buildings or blocks of buildings from the enemy step by step. Thus it is a small

group which is the spearhead of attack in urban fighting."[52]

The shock groups were broken into three teams: the storm, reinforcement and reserve groups. The storm group was designed to fight inside the objective, destroy the enemy and to secure the whole building. The second group, the reinforcement group, followed the storm group into a building, helped clear it and then immediately began to establish a defense and create new firing positions. The reserve group provided the replacements for the storm group.[53]

The commander of the shock group accompanied the six to eight men of the storm group. These men were lightly armed with grenades, submachine guns, shovels and knives. The reinforcement groups were heavily armed with machine guns, antitank rifles, mortars and explosive charges. Engineers were part of the reinforcement group. The reserve group had sufficient composition to be able to recreate either storm or reinforcement groups.[54] No exact organization for a shock group was developed. Chuikov felt, at the time, that each soldier should be able to serve in a shock group. This shock group should be created as much as possible from one organization using an infantry unit as the base. He placed particular importance on the engineers of the shock group. He noted that "the sapper is an important figure in street fighting. His place in the shock group is a place of honor."[55] He also felt that this type of organization should be practiced in the same manner that any infantry battalion practices formations and maneuvers in training periods.[56]

The very close nature of the fighting, often twenty to thirty meters, coupled with the rugged terrain, created a role for the sniper that was considerable different than his normal role in open terrain.[57]

The sniper would stay hidden in one location for days taking only occasional shots. The constant pressure of the close terrain and the snipers created considerable loss and harrassment for the Germans.[58]

Chuikov stressed the use of artillery in support of the shock groups.[59] The use of this artillery in night fighting became an art. During the day, targets would be identified and targeted. Often these targets were only eighty meters from the potential firing sites. At night, the gun crews would move into the open, fire a few rounds, and retire. A follow-up assault by the infantry that night or in the morning would verify the deadly accuracy of the night artillery firing.[60] Artillery pieces up to 203mm were placed in shock groups to direct fire on targets as close as one hundred meters.[61]

Tanks were in limited supply during the first stages of Stalingrad because of the problems in bringing them across the Volga.[62] Some tanks, however, were produced within the city, notably at the Red October Tractor Factory. These tanks were immediately integrated into the shock groups.[63]

Chuikov noted the effects of rubble production on city fighting and preferred to attack without the use of preparatory barrages. He chose to rely upon surprise rather the firepower of the weapons.[64]

The Soviet shock groups, formed at Stalingrad, were the basis for their street fighting for the remainder of the war. Not only did the Germans lose vast amounts of manpower and equipment at Stalingrad, but they lost the urban warfare knowledge gained through experience by their troops. Conversely, the Soviets learned many lessons in city fighting and task organization that were valuable to them during the remainder of the war.

The paucity of specific task organization data in the references, coupled with General Chuikov's preference to set no clear guidance for shock groups, precludes the use of Stalingrad in the numerical analysis portions of chapter 4. This vignette, however, provides clear guidance on the use of small combined arms teams in street fighting.

VELIKIE LUKI (4)[65]

Velikie Luki is a Soviet town on the banks of the Lovat River, about three hundred miles west of Moscow. In 1942, it was a key rail and road junction. For nearly eighteen months, the Germans had occupied the town and had been working on its defenses. An extensive series of pillboxes and obstacles, protected by electrically charged wires, surrounded the town. The town was defended by 8,000 German troops supported by sixteen heavy artillery pieces, forty light artillery pieces, twenty antiaircraft guns, one hundred mortars, three hundred machine guns and ten tanks.

The attack by the Soviets occurred between 13 December 1942 and 1 January 1943. Their attack plan called for organization of assault detachments. These detachments included up to one hundred men and was organized into five groups. These were the reconnaisance, assault, covering, consolidation and reserve groups.

The reconnaisance group had five to six men. Their mission was to precede the main body and provide information. The assault group was made up of twenty-one men: the detachment commander, his assistant, ten riflemen, two machine gunners, three engineers and four chemical soldiers with two flamethrowers. The covering group included forty men, two heavy machine guns, three mortars, an antitank rifle and a 76mm

gun. They were responsible for the destruction of the enemy stronghold. The consolidation group had up to seventeen men, five were engineers, the rest were infantry. Their mission was to consolidate on the objective and prepare it for defense. The reserve group included seven riflemen and engineers. In addition to this grouping, most of the divisional artillery was attached to the assault detachments. Overall 75% of the division's artillery was placed in assault detachments for direct fire missions.[66]

After twelve days, the assault detachments succeeded in capturing Velikie Luki. The German losses were put at 7,410 killed and wounded and eighty captured.[67]

> Velikie Luki provides a fine example of combat in an urban environment. The references available provide good guidance on the engineers and artillery ratios used in that engagement. These figures will be useful in the data analysis portion of this thesis.

RZHEV (5)[68]

Rzhev is located about one hundred miles west of Moscow. During the year and one-half that the Germans occupied the town, they had completed fortifying the major parts of the town. The southeastern part had extensive pillboxes, antitank obstacles and barricades. The northeastern part, however, was more open and had a sprawling residential area.

A Soviet tank brigade was tasked to capture the northeastern part of Rzhev. To achieve this, assault groups were formed within the tank brigade. These groups used a tank company as the base to which was attached an infantry platoon, three antitank rifles, one antitank

gun, one-half of an engineer platoon, two portable flamethrowers and a group of submachine gunners.

These groups practiced their joint role for three days prior to the actual assault. When the groups attacked at 0430, they caught the Germans by surprise and secured their objective in a few hours.

This is a good example of a tank heavy unit attacking a sprawling residential area. The analytical use of these figures must be tempered with the knowledge that this was a open type residential area applicable for tanks. The role of joint training prior to the assault should be noted. This prior training lends credence to the proper task organization having also be tailored to fit the terrain.

POZNAN (6)

In late January 1945, the Soviet Army was moving through Poland at a rate of twenty-five to thirty kilometers per day.[69] When the Warta River was reached and successfully crossed, the fortress city of Poznan posed a challenge.

Poznan was an older city, built to the specifications of the renowned fortress builder Vauban, that served as a major rail and road junction enroute to Germany.[70] The structures in the outlying fortresses could withstand shells and bombs up to 1000 kilograms in explosive power.[71] The forts were basically underground with only a small portion visible above the surface.[72] All the forts were heated, lighted and had internal wells.[73]

To supplement the older forts, the Germans had built a series of pillboxes, about 160 meters apart, that were connected with a stone wall. Along the wall, there were twenty-four firing ports to complement the

pillboxes which had between five and fifteen firing ports each.[74] Strongpoints were developed in depth within the town. Stockpiles of additional weapons and ammunition were made throughout the city.[75]

Poznan was defended by 40,000 German soldiers commanded by a military police major general and a combat arms brigadier general.[76] "In short, Poznan with its forts and other defenses was a hard nut to crack," was the comment of General Chuikov.[77]

Poznan forced the Soviets to conduct the urban attack concurrent with a pursuit operation further to the west. Initially, the Soviets chose to maximize the pursuit effort so that the Germans could not regroup.[78] However, Poznan could not be left without strong encirling forces, or the Germans could have broken out and rejoined their main force, had Hitler permitted it. Fortunately, Soviet successes in secondary crossing sites along the Warta permitted several units to relocate and attack Poznan.[79]

The initial force allocated to secure Poznan was forty-eight rifle battalions, five artillery brigades and one Guards regiment of multiple rocket launchers or 'katyushi'.[80] The preliminary attacks on 29 January met with initial success in that two minor forts in the southern sector fell. The northern attacks, however, did not have such success. The Soviets had left the western approaches to the city open, but the Germans chose to remain rather than exit Poznan.

The task organization of the infantry battalions and artillery brigades used initially did not meet with success. Chuikov commented, "but our calculations proved wrong. We realized that we must reorganize our dispositions and recreate the storm groups and detachments of Stalingrad. Otherwise, we should suffer heavy losses for little results."[81]

Chuikov recognized that the combined arms team of infantry, armor, engineers and artillery were needed for success.

The fighting was heavy and fierce. During the course of the battle, 203mm guns were fired point blank into the walls of Poznan Citadel, but to no avail.[82] Finally, on the evening of 22 February, the Soviet's continual pressure and forward momentum extracted its toll and the German defenders surrendered. Twelve thousand Germans became prisoners of war.[83]

While the successful task organization used at Poznan was not available, the unsuccessful one was. This unsuccessful task organization using solely infantry and artillery was noted by the commander and steps were taken to use the small combined arms shock groups. Thus while Poznan can not be used to substantiate specific ratios it does prove that lack of engineers and armor are not successful mixtures.

KEONIGSBERG (7)

In early 1945, the Soviets had crossed Poland and were entering eastern Prussia. By February, the front lines had reached within forty miles of Keonigsberg, the capital of East Prussia.[84] Keonigsberg had both old and new type construction. The center of the city was in a radial design that had been built beginning in 1525. The northern portion of the city was laid out in parallel streets while the southern portion was a mixed design.[85]

The city was ringed by three defensive belts. The outer belt was called the Deime Line and was nearly forty kilometers from the city.[86] The next belt was six to seven kilometers from the city center and was sited along the radial highway. This line consisted of twelve major forts, numerous pillboxes, antitank ditches and a continuous barbed wire

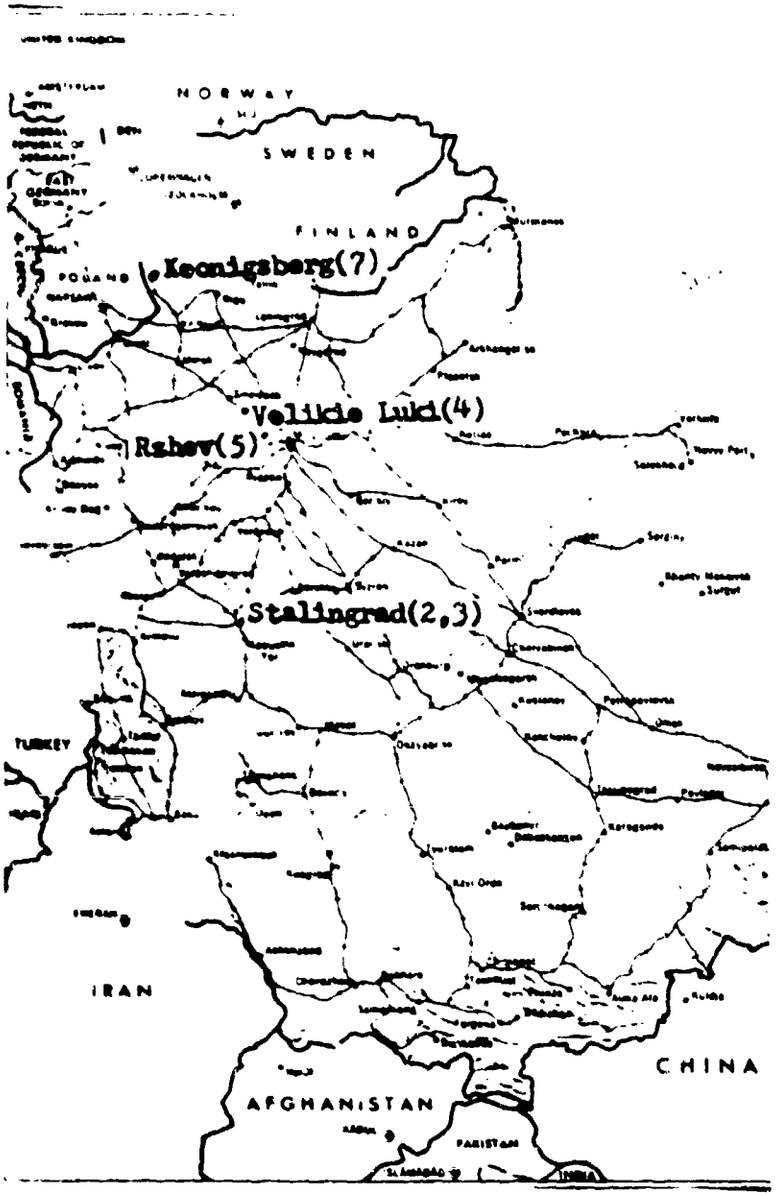

Figure 2. USSR Urban Engagements

obstacle fence.[87] These forts were located within three to four kilometers of each other and had wire and communications trenches between them. Every fort was garrisoned by 150 to 200 men and were well armed with between fifteen and twenty guns of various calibers. These forts were surrounded by antitank ditches twenty to twenty-five meters wide and seven to ten meters deep.[88] The inner defense belt was located along the older section of town and included twenty-four earth forts, an antitank ditch and many wire obstacles.[89] Between the inner and outer belts, there were two intermediate defense zones that included several parallel trenches, earth, timber and concrete pillboxes, and many minefields and other obstacles.[90]

The center of the city was defended by a series of strongpoints that had been sited in solid buildings and had interlocking fires between these strongpoints. Once again, all of these strongpoints had been augmented by wire obstacles, mines and other barricade materials.[91]

Task Organization

General Galitskiy, the Soviet commander at Koenigsberg, felt that his carefully organized reconnaissance effort was "one of the most important phases of preliminary activity which assured the success of the assault."[92] He was able to determine the exact fortification and strongpoint system to only a limited extent, but when the reports of prisoners, deserters and local inhabitants were compiled, he obtained a fairly good picture of the defenses. Engineer parties were sent into the German rear areas to serve as both listening posts and stay-behind observation posts.[93] The importance he placed on reconnaissance is evidenced by the fact that he assigned senior noncommissioned officers and junior officers to this mission.[94]

The first consideration in General Galitskiy's battle plan was to determine his course of action. He chose to drive wedges between the strongholds and then to destroy them at will.[95]

"The second important question in planning of a battle for a city is the formation of battle formations with consideration for the peculiarities of a specific inhabited point," were his comments regarding task organization.[96] The units were organized into two or three echelons depending on their location and mission. Each assault unit, of company size, was assigned to one street. Each battalion was assigned two streets as their zone of attack.[97]

The basic assault unit was formed around the rifle company. These fifty to sixty men would be reinforced with one or two 45mm guns, two field artillery guns, one or two divisional artillery guns, one 122mm gun, one or two tanks, a heavy machine gun platoon, a mortar platoon and an engineer platoon.[98]

This assault unit was, in turn, formed into four subgroups. The first group was called the attack group. It had twenty to twenty-six riflemen and submachine gunners, a light machine gun or flamethrower, and one-half of an engineer platoon. The second,or consolidation group, was composed of eight to ten riflemen, a heavy machine gun platoon, one or two artillery pieces and the rest of the engineer platoon. The fire group was composed of the majority of the available artillery pieces, 82mm mortars, and the tanks. The reserve group was made up of ten to fifteen riflemen,several heavy machine guns and perhaps an artillery piece.[99] These four groups were employed as two groups. The attack and consolidation groups would move forward while the fire and reserve groups provided covering fire. If necessary, the attack groups

were also broken up into four smaller units of four to six riflemen each.[100]

From the divisional perspective, three echelons were used in battle. The assault groups comprised the first echelon. The tanks in this echelon moved in pairs, providing cover for each other. Additionally, specific submachine gunners were tasked to look for antitank guns or mines along the routes of the tanks.[101] The second echelon usually included an entire tank company that could be committed to exploit a breakthrough.[102] The second echelon usually moved three to four hundred meters behind the first echelon.[103] The third echelon usually included a large tank force that could be committed by the Army commander for exploitation. These tanks were mostly use to conduct bypass operations during the course of the Keonigsberg fighting.[104]

There were both heavy and medium tanks in the battle. The policy was to place the heavy tanks in the first echelon and place the medium tanks in the second and third echelons because of their increased maneuverability.[105] When the tank units were used separately, engineer troops, usually one-half of a platoon, were assigned to each tank platoon. They were assigned, four to a tank, to help spot mines and other obstacles, and to move them when necessary.[106]

The Soviet Air Force played a major role in the Keonigsberg action. They were used to gather intelligence prior to the battle on locations of strongpoints and fortifications. During the battle, they located air defenses but primarily dive bombed specific strongpoints in close support of the attacking ground forces.[107]

Training for the Battle

In addition to planning for the battle and task organizing,

considerable emphasis was placed on preparing the officers and men for city fighting.

At the individual and unit level, men were taught to move properly in the city, handle grenades, mines, demolitions and to breach obstacles. The artillery units practiced independent firing missions so their crews became familiar with direct firing techniques so they could support the assault groups. Tank units trained on overcoming street obstacles and the methods of continuous fire support for infantry troops. Each technical branch trained in their specific role for the city fighting.[108]

Political party organizations were created that held seminars, each lasting two days, meetings and demonstrations at the assault group level. A pamphlet entitled "To Assault on Keonigsberg" was developed and issued to the soldiers. The Red Army Newspaper also provided many street and city fighting tips in those editions distributed to soldiers of the Keonigsberg fo[illegible].

The officers had extensive training prior to combat as well. Duplicate models of the city were constructed so the chain of command could wargame the various possibilities and courses of action on them. The entire combined arms teams, including the Air Force, was physically brought together and spent several days to exactly coordinate their roles and actions to be taken during the fighting.[109]

Commander's Observations

General Galitskiy made several observations after the fighting was over:[110]

a. Encirclement of the city is not sufficient. An immediate attack must be made before the defenders can improve their positions.

b. All source intelligence must be molded together to insure nothing is omitted.

c. Ordinary battle formations are not practical for city fighting. Assault groups must be formed.

d. A large reserve is essential in either counterattacks or to serve as a replacement pool.

e. Control of city fighting is difficult. Commanders must be with their companies to influence action immediately.

f. Special attention must be paid to planning and training for battle in a city.

Koenigsberg provides apparently good references on task organization. Of special interest is the amount and detail of planning and training given by the Soviets prior to the battle. Thus, the ratios provided by Koenigsberg should be indicative of a well planned task organization for a large city.

GLOGAU (8)[111]

Glogau, a Polish town about sixty miles from Germany, lies on the Oder River. It was divided into a series of strongpoints constructed in key buildings such as the railroad station, a stadium and the municipal buildings. These strongpoints were augmented with various types of wire, mines and obstacles.

The Soviet attack plan included the use of assault groups. Each assault group was formed around an infantry platoon to which was attached ten to twelve engineers, two tanks and two artillery pieces. This combined arms team proved satisfactory to quickly secure the town on 2 April 1945.

BRESLAU (9)[112]

Breslau was portrayed in an April 1945 Red Star article as an encircled city defended by a very thick and effective defense. The assault group was described as the key element in the Breslau fighting. These assault groups were an infantry company to which was attached one-half of an engineer platoon, two to three artillery pieces and either a tank or a self-propelled gun.

Another example of the task organization at Breslau was described as having an infantry battalion supported by four self-propelled guns, two 152mm guns, an engineer platoon, one 122mm gun and a signal section.

Both of these organizations performed effectively. The data available is sufficient to warrant consideration of these task organizations in chapter 4. It is worth noting that Breslau is a large city that was captured in the later stages of the war.

BERLIN (10,11,12)

Berlin might be considered the capstone of urban warfare during World War II. Although the outcome of the war was evident by April of 1945, the German defenders of Berlin conducted a good defense which inflicted many Soviet casualties and caused considerable delays in the Soviet war plans. The two weeks of fighting in the city proper, from 22 April until 4 May, cost over 300,000 Soviet casualties.[113]

Three concentric rings surrounded Berlin with their defenses focused predominantly to the east. The Germans did not expect an attack from the west.[114] The forward or outer positions were established along a chain of lakes located seven miles east of Berlin's limits. The middle ring consisted of a series of minor natural and artificial obstacles that

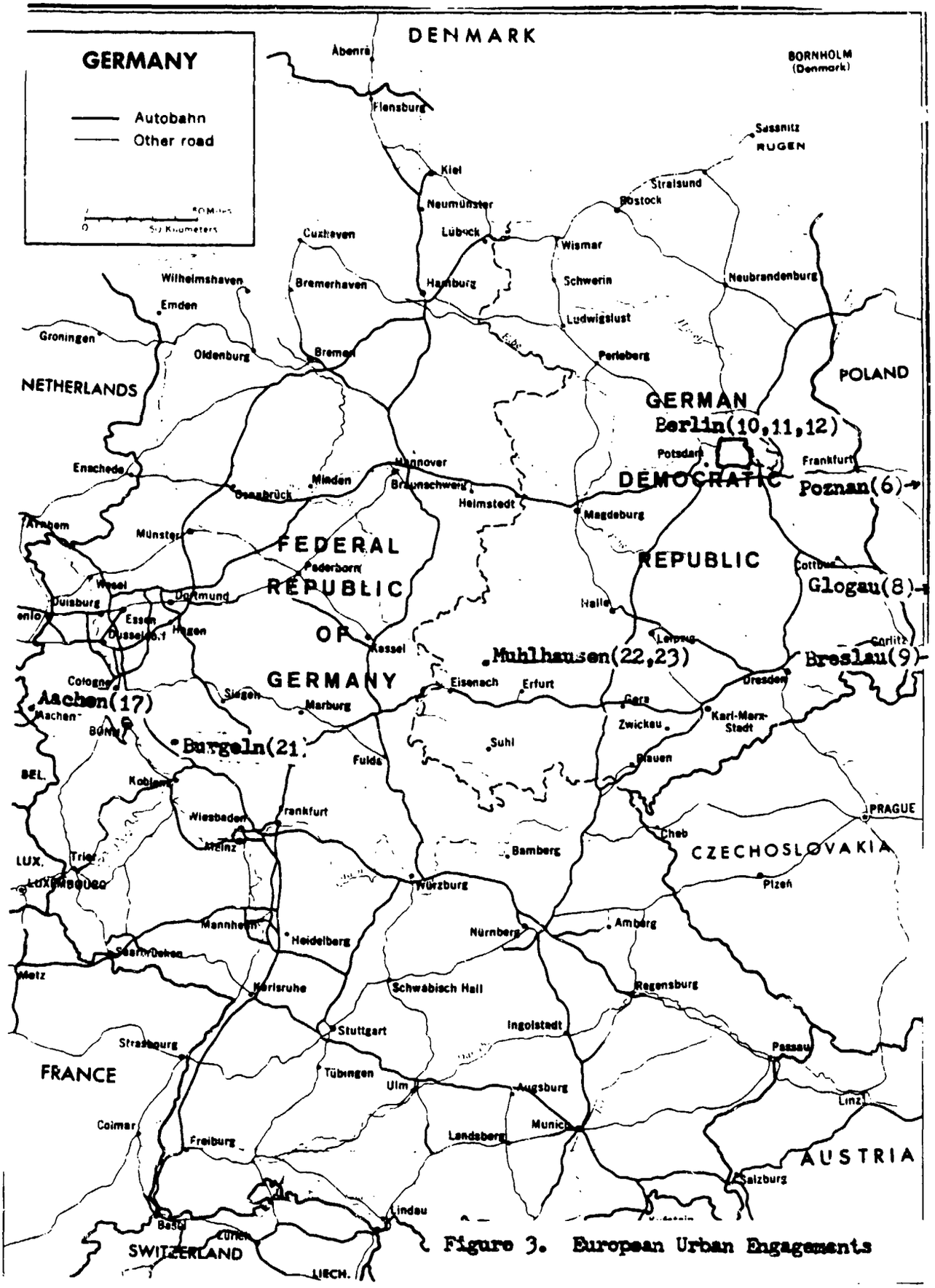

Figure 3. European Urban Engagements

stretched for sixty-nine miles around the eastern portion of the city. The inner ring was based along the perimeter railroad which ran in a circular pattern about three miles from the center of Berlin. The central portions of Berlin served as the final defensive area. It was an oval region five miles long and t o miles wide. All of these concentric rings had no defense in depth but rather were only a single line of positions.[115]

Berlin included about 350 square miles and over three million civilians.[116] Marshall Zhukov, the Soviet Commander, described Berlin as:

> "Never before in the experience of warfare had we been called upon to capture a city so large and so heavily fortified as Berlin. Its subway and other widespread engineering networks provided ample possibilities for troop movement. The city itself, and its suburbs had been carefully prepared for defense. Every street, every square, every alley, every building, canal and bridge represented an element in the city's defense system." [117]

The first element in Marshall Zhukov's plan was to isolate Berlin. His First Byelorussian Front quickly bypassed and isolated Berlin by 24 April.[118]

Coincident with this isolation, other Soviet units had entered the defense belts. On 22 April, the outer defense belt was broken in the north.[119] On 24 April, the final defense of Berlin began along the inner ring. At this point, the defenders of the encircled city are best described in a German after action report as:

> "The LVI Panzer Corps was equal to about two divisions, and the Waffen SS Forces to about half a division, and all other forces to from two to three divisions, a total of four to five divisions. The city contained an estimated 60,000 soldiers and from 50 to 60 tanks."[120]

These figures do not include the non-effective military strength. This tre strength equates to sixty-seven defenders per square kilometer.

The Soviets claim, however, that 1200 men were available per square kilometer.[121]

The cost to the Soviets was high but it was only a matter of time until their preponderance of forces forced the capitulation of Berlin. The official fighting in Berlin ended on 2 May when General Weidling, the German commander, officially surrendered the German garrison and Berlin.

Task Organization

At the start of the battle, Marshall Zhukov saw his main task as:

> "the very essence of the main task of street fighting in Berlin consisted in depriving the enemy of a chance to muster his forces into one fist, in splitting up the garrison units into separate pockets of resistance and in thereafter speedily destroying them."[122]

To do this, the initial plans called for 800 tanks and self-propelled guns to enter the city.[123] The assault groups were initially organized of one tank battalion, one infantry battalion, one engineer company, one artillery battalion (of not less than 122mm guns) and a platoon of flame throwers.

This armor heavy task organization was used in the suburbs which had a large number of gardens, parks and squares.[124] A tank brigade was usually given the mission of enveloping four to six buildings.[125] These buildings were usually nearly a block square, however. The assault groups attacked on a two or three block front with heavy reserves in the center of their sector.[126] The boldness of these tank heavy assault groups played a major part in this portion of the city fighting.[127]

As the fighting progressed into the inner city, the number of tanks became a detriment. The Soviets noted that "the use of massed tanks is not recommended."[128] They shifted their task organization to

one which task organized from a platoon to a company of infantry, three to four tanks, two to three self-propelled guns, two to three rocket artillery mounts, a platoon of engineers with powerful explosive equipment and several 85mm or 122mm guns for direct firing. Often either 152mm or 203mm howitzers were also included in this organization.[129] During this portion of the Berlin fighting, up to 80% of the total artillery assets were used in the direct fire mode.[130]

General, later Marshall, Chuikov, who commanded the 8th Guards Army at Berlin, was more direct in his criticism of tank employment during the Berlin fighting:

> "The first mistake-bringing the tank army into battle before the mixed infantry units had reached the Seelow Heights-brought in its wake the second mistake by the Director of the Berlin Operations (Marshall Zhukov) that of now directing the tank armies against the city of Berlin itself, instead of sending them round it from south or north."[131]

Chuikov's criticism of his superior is extraordinary, yet he further noted:

> "Of course this does not mean that tanks are in general unsuitable for street fighting. I am far from thinking that. They are needed, but not as an independent force, but for joint actions with other ground units and in assault groups. Only when they are working in cooperation with infantry units, artillery, engineers and chemical warfare troops will the tank crews know where danger is lying in wait for them."[132]

Marshall Konev, fighting in another sector of Berlin, noted that "the farther we advanced (into Berlin) the more we integrated tanks with the infantry."[133]

Several aspects of the Berlin fighting are unique. The many underground structures posed many challenges for the Soviet soldiers. Marshall Konev noted that:

> "Our troops would capture some center of resistance and think they had finished with it, but the enemy, making use of underground

passages, would send reconnaissance groups, as well as individual saboteurs and snipers into our rear."[134]

The nearly unlimited supply of antitank weapons, faustpatronen, by the Germans, caused many problems also. Marshall Konev wrote that:

> "A faust gives those who are physically unfit and untrained for war a feeling of confidence. It makes them feel that, having become real soldiers but yesterday, they can already do something real today."[135]

Aircraft were not forgotten in the street fighting. However, the effects of dust, smoke and debris coupled with the close lines of contact, made air support fairly unsuccessful.[136]

Berlin has been variously described as a "mopping up operation,"[137] and as "pointless,"[138] but it did have some lessons in urban warfare. After the battle, Marshall Chuikov described what he felt would be an ideal organization for assault forces. He recommended creation of assault detachments made up of three to six assault groups each. Each assault group would have one infantry company, one section of heavy machine guns, up to one engineer platoon, two to five flamethrowers, four to six 45mm and 76mm guns, one platoon or company of tanks and either a platoon of self-propelled cannons or a battery of self-propelled artillery.[139]

Berlin showed that tanks have a point of marginal utility. Too many tanks created excessive casualties for the Soviets. Three different task organizations are presented in this vignette. The circumstances of each should be recalled when using chapter 4.

The Soviet claim of 1200 defenders per square kilometer must be discounted because that would require a defense force of over one million Germans. This was clearly excessive.

ORTONA(13)

In December 1943, the British 8th Army was making slow but continued progress northward along the eastern portion of Italy as part of the Adriatic Front of World War II. The 1st Canadian Division was operating on the eastern flank of the Army as part of the 5th British Corps. The 8th Indian Division was on the left flank of the Canadians. The arrival of winter precluded any possibility of offensive operations in the snow covered mountains to the west. Accordingly, the British reinforced their right wing along the Adriatic Sea. On 16 December, they reached a total of four divisions abreast on a twelve mile front stretching from the sea inland to near Orsonga.

Initially, the British did not expect the Germans to make a serious stand at Ortona. A British operations order stated that "the Eight Army is going to reach the line of the River Arielli by 24 December."[140](five miles north of Ortona).

The press coverage played a role in making Ortona an important military objective. On 8 December, Ortona was referred to by the Associated Press(AP) as merely the Adriatic end of the "makeshift German defenses."[141] However, on the 14th, the AP called Ortona a "strategic road junction."[142] On 16 December, the AP cited a captured German document that said the city was to be held at all costs.[143] On 22 December, the press again referred to Ortona as a "miniature Stalingrad."[144]

On the other hand, German Field Marshall Kesselring, told his local commander that "it is clear we do not want to defend Ortona decisively."[145] Regardless of Ortona's importance, the Canadian division emerged from the fighting with an enhanced reputation and

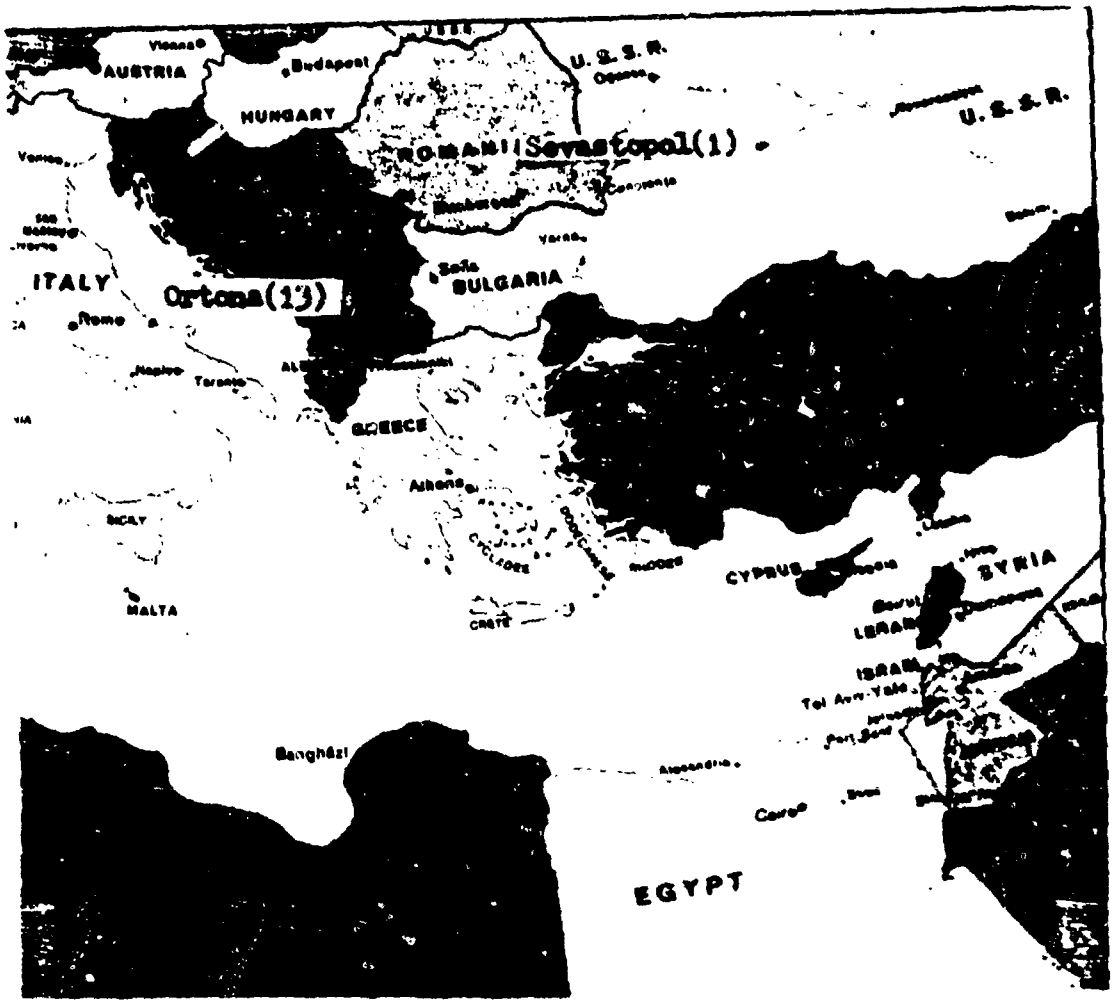

Figure 4. Mediterranean Area Urban Engagements

provided the Allies many basic techniques of city fighting that would serve as models for future Allied doctrine.[146]

The 1st Canadian Division had three organic brigades. The divisions 2nd Brigade was involved in the Ortona fighting. This brigade had two of its three regiments initially involved in the fighting. The three regiments were the Princess Patricia's Canadian Light Infantry, the Seaforth Highlanders of Canada and the Loyal Edmonton Regiment. The later two regiments, actually battalion sized elements called regiments, bore the brunt of the Ortona fighting.

The 2nd Brigade was supported by the Three Rivers Armor Regiment, the 5th Field Company of the Royal Canadian Engineer Corps, an artillery regiment and the 90th Antitank Battery.[147]

The defenders were from LTG Richard Heidrich's elite 1st German Parachute Division. Initially, the 2nd Battalion of the 3rd Parachute Regiment conducted the defense. On 24 December, LTG Heidrich committed the 2nd Battalion, 4th Parachute Regiment.

The defenders had carefully chosen and planned a "killing ground" in Ortona.[148] Their defense was based on detailed knowledge of the town, its approaches, alleys, street buildings and even rooms to get the maximum advantage over an attacker.[149]

Ortona was originally constructed when Venice was at the height of its maritime power. A massive 15th century castle dominates the town. The streets are narrow, dark and surrounded by tall houses. Overall, the town was about 500 yards by 1500 yards in size.[150] The southern portion of the town was more modern and designed in a rectangular block pattern. In this section, one tank could traverse the streets. On the west, the town was isolated by a deep ravine for about one third of its

north to south length. On the east side, sharp cliffs dropped quickly into the harbor. One main street traversed the town from north to south. This road emptied into a large plaza dominated by a cathedral in the center of town.[151] The older part of town had underground passageways that linked as many as six houses together.[152]

At first light on 21 December, the Edmontons attacked north with two companies abreast. By nightfall, they had cleared the southern portion of the town and were about one-fourth of a mile from the central plaza. The going had been tough and the entire Seaforth Regiment was committed to the fighting that evening.

Dawn on the 22nd disclosed the German defense plan that channelized the attackers into the central plaza with the intended purpose of making it a killing ground. The Edmontons placed one company on each side of the street with one company in flank protection and one in reserve. With the support of several tanks, somewhat to the rear, they advanced to within twenty-five yards of the plaza. Enroute, they adopted the systematic clearing of houses prior to moving to the next house. The defenders often slipped back into former positions-sometimes up to four times, if the Canadians did not immediately prepare defensive efforts.[153]

During the fighting, the tanks provided considerable direct fire that covered the infantry advances. They also served as weapons and ammunition carriers for the infantry. When the rubble piles were too well covered by fire to permit the engineers to use demolitions, the tanks used their guns to blow the top off the piles by continual high explosive fire.

Progress on 23 December was limited to two hundred yards. This led to the use of "mouseholing" that was taught in their training over

a year prior. It consisted of moving from building to building by blowing or chipping a hole between buildings so that no street exposure was necessary. In doing this and other types of demolition work, it was noted that unit pioneers were necessary to emplace these demolitions because regular infantrymen often caused accidents to occur.[154]

The bitter fighting continued through Christmas day. The only high spot of the day was the holiday meal served in the evening. On the 27th, the Canadians committed the third regiment of the 2nd Brigade, the Princess Patricia Regiment, and a fresh squadron of the Three Rivers Armor Regiment.

The addition of these new forces, coupled with the German decision to avoid a major loss resulted in a German withdrawl from Ortona late in the evening of 27 December.

During the fighting, the Edmontons lost sixty-three dead and 109 wounded. The Seaforth Highlanders lost forty-one killed and sixty-two wounded. The German parachute battalions admitted to sixty-eight killed and 205 missing. However, in one spot nearly one hundred of the missing paratroopers were found buried. Probably, most of the 205 missing were dead.[155]

Ortona demonstrated the need for engineers and armor to aid the infantry forces. Although more reference would have been helpful in determining exact unit make-up, sufficient data was available to permit this task organization to be used in the analysis portion of this thesis.

THE BRITTANY FORTRESSES (14, 15)

After United States forces secured the town of Avranches, located in the extreme northeastern corner of the Brittany peninsula, on 31 July

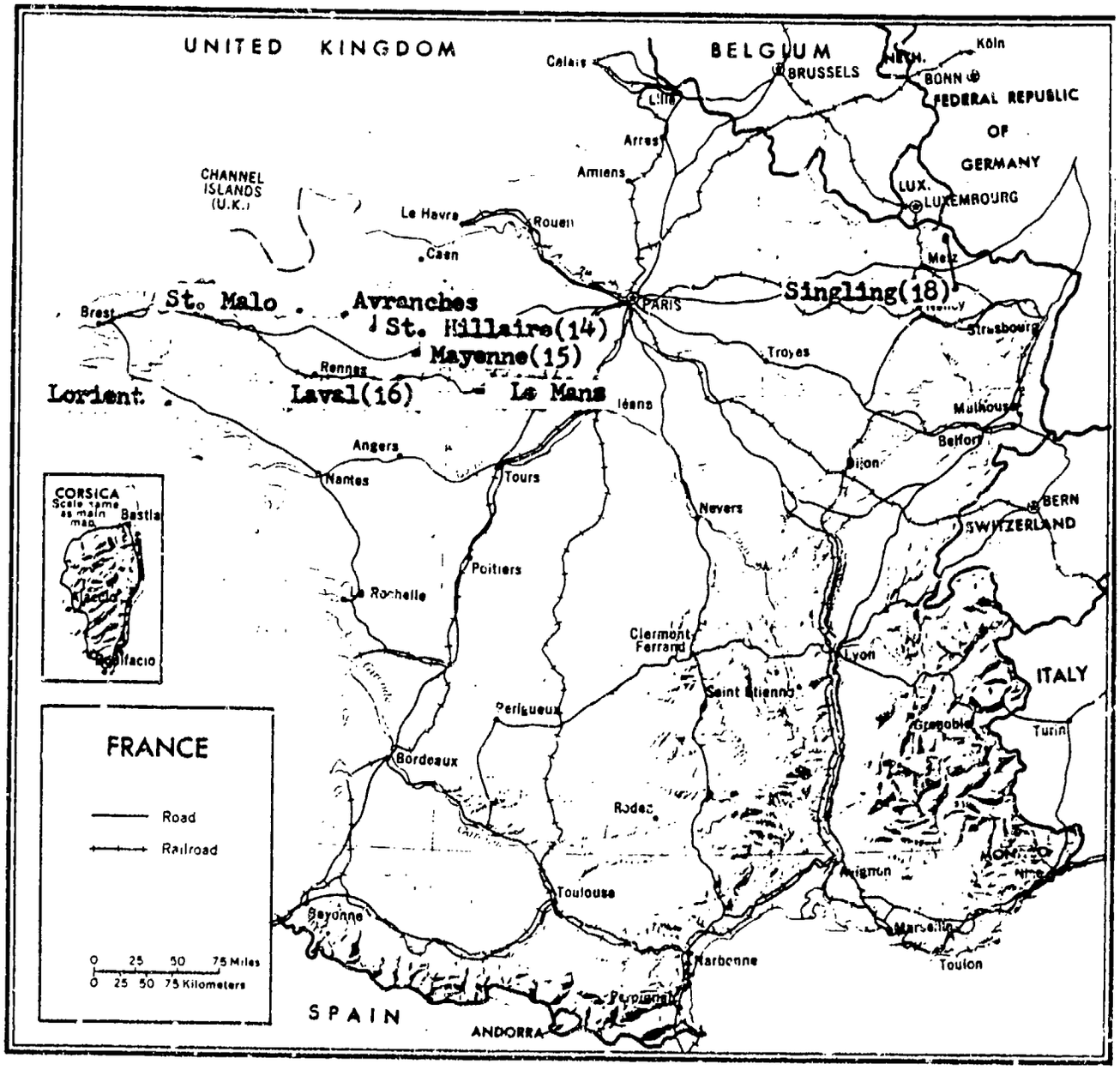

Figure 5. Urban Engagements in France

1944, they began an armored drive across the peninsula the next day.[156] Most of the peninsula had been prepared with defensive positions and obstacles. Four cities were designated as fortress cities by the Germans. These were the cities of Brest, St. Malo, Lorient and St. Nazaire.[157] See figure 5 for these locations.

The fortress city concept required a defense to be established outside the town. If that failed, the city would become a fortress to be defended to the end by the occupants. Each fortress city had a designated commandant who was tasked to prepare the city for defense. He relinquished command when a tactical commander withdrew his forces into the city.

The US strategy was to strike quickly and deeply into the central plateau of the peninsula and then to isolate and subsequently reduce the isolated cities.[158] The US forces isolated St. Malo and St. Nazaire by 5 August and Brest and Lorient by 7 August.[159]

The first fortress city to be challenged was St. Malo. Task Force A, commanded by General Earnest, had moved towards the town, been challenged and had circled the town instead. Task Force A was a tank destroyer brigade headquarters which controlled a tank destroyer group, a cavalry group and an engineer battalion.[160] This task force was joined by the 330th Infantry Regiment, but even this combined task force was considered inappropriate for the task of reducing St. Malo. General Middleton, the corps commander, moved the 83rd Infantry Division into the area to reduce St. Malo.[161] During the course of the battle, the division was reinforced by another infantry regiment, a medium tank company and an artillery battalion from the 8th Infantry Division.[162] The exact task organization at the lower level was not determinable,

however, considerable mention was made of combined arms teams in the reduction of St. Malo. Such comments as "supported by tanks and tank destroyers, the infantry systematically measured their progress by streets."[163] And "engineers dynamited passages from house to house to enable infantrymen to fight forward one building to another," are common in the references consulted.[164] St. Malo and its surrounding area were finally secured on 2 September 1944.[165]

Brest was a port city of 80,000 citizens at the western tip of the Brittany peninsula.[166] After the initial arrival near Brest on 7 August, several actions were taken to quickly seal off and capture the city. On 11 and 12 August, Combat Command A of the 6th Armored Division tried several times to isolate Brest but General Grow, the division commander, concluded that additional resources would be required. He felt that "artillery to neutralize the guns in Brest and permit an advance through the outer defense, infantry and a strong engineer attachment to attack the city proper, and fighter and medium bomber support to assist the assault troops and reduce the inner defense," were needed.[167]

Task Force B was created under the command of BG James A. Van Fleet, Assistant Division Commander of the 2nd Infantry Division. Task Force B included the original Task Force A under General Earnest and added three artillery battalions, an armored infantry battalion, a tank destroyer company, a medium tank company, a battery of self-propelled howitzers and an infantry battalion. From 21 to 25 August, this task force completed the task of isolating Brest from the rest of the peninsula.[168]

Three divisions were aligned to capture Brest. The 29th

Division on the right, the 8th Division in the center and the 2nd Division on the left.[169] From 25 August until 7 September, only three to four miles of penetration were achieved.[170]

Again, the exact task force organization at the lower levels was not available in the sources checked. Several references did mention the use of combined arms teams at the lower levels. "The actual conquest of the garrison had come as a result of action by the combined arms, heavy artillery fire, infantry assault, engineer blasting operations and the use of flame throwers."[171]

One drawback in the use of infantrymen to augment the engineers in their demolition work was noted: "the advance was limited by the number of demolition teams available."[172] The desire to advance caused more demolition teams to be created. This caused mishaps "such as collapsing an entire building when simply trying to blow a hole in a wall...(this) indicated the dangers inherent in having infantry soldiers employ explosives."[173]

After considerable hard and costly fighting, the city surrendered on 18 September. The US casualties totaled 9,831 while the number of Germans taken prisoner numbered 38,000. Although Brest was originally sought as a port, the degree of destruction created by the Germans precluded this. The Allies made the decision to not invest the resources required to quickly turn Brest into a usable port.[174]

Neither Lorient nor St. Nazaire were ever attacked in strength. Both surrendered on 10 May 1945.[175]

These actions were the first encountered by the Allies on the continent. They found combined arms teams essential. They also attempt- to tailor their organizations to the ground as evidenced by the increased

tanks and engineers used as the urban area became larger. The recurring problem of using infantrymen as engineers with poor results was relearned by the US forces. These task forces are considered representative for the type terrain encountered and should be useful in the data analysis.

LAVAL AND LE MANS (16)

While the VIII Corps, under General Middleton, was conducting the Brittany peninsula operations, General Patton's other corps in his Third US Army, the XV and the XX Corps, turned southeast and moved towards Germany.

One of the first towns encountered was St. Hillaire. Task Force (TF) Randolph was the screening element of the 90th Division. It included a light tank company and a reconnaissance company. TF Clark followed TF Randolph as the division moved towards St. Hillaire. TF Clark included a motorized infantry battalion, a 105mm artillery battalion, an engineer platoon, a tank destroyer company and a signal detachment.[176] St. Hillaire was quickly taken by these two task forces.

Task Force Weaver was organized to capture the next town, Mayenne. This TF included a tank battalion, a motorized infantry battalion, an engineer company, a tank destroyer company, an antiaircraft battery, a signal detachment and a military police detachment.[177] Mayenne quickly fell to this force.

Laval was the next major town encountered. Although this town was defended by two security and one flak battalion, it also quickly fell to an assault from the 79th Division. The attacking force included an infantry regiment, a reconnaissance company, two artillery battalions, a tank battalion, an engineer company, a tank destroyer company and a

medical battalion.[178]

The fall of these three towns demonstrated that no significant opposition was present. However, it should be noted that in these three cases, as the units moved deeper towards the suspected enemy, the task organization grew stronger in armor and engineers.

Le Mans was approached by the XV Corps and its 106th Cavalry squadron on the afternoon of 7 August. This unit was halted on the outskirts by the defenders. The 313th Infantry Regiment of the 79th Infantry Division next tried to enter the city at 2100 on 7 August but was recalled.[179]

The corps commander, MG Haislip, then tasked the 79th Division to take the southern half of the city, the 90th Division to take the northern half and the 5th Armored Division to seize the high ground to isolate the city from northeast to southeast.[180] These units were able to force the fall of Le Mans on 8 August 1944.[181]

All of these actions demonstrated that quick, decisive actions taken before an enemy can organize a defense will enable a town to be quickly taken without attachments to the basic infantry units.

AACHEN (17)

Aachen is a German city along their western boundary. See figure 3. It is an old and important city to the Germans. As the probable birthplace of Charlemange, it served as the religious center of German Catholics. Over thirty-two kings and emperors were crowned in its cathedrals during the past ten centuries. This heritage prompted the Nazis to use Aachen as a symbol of National Socialism Ideology.[182]

Aachen had a prewar population of 165,000 but only 20,000

civilians remained at the start of hostilities.[183] Within the town, the buildings were mostly old, thick walled, stone structures. During the fighting, nearly 80% of the buildings were destroyed or badly damaged.[184] The town was 152 square kilometers in area but the portion that saw US ground action was only twenty square kilometers.

Originally, the Allies had planned to bypass Aachen. However, it became an objective for several reasons.[185] First of all, Aachen had always had military value because of the roads radiating in all directions from the city.[186] Secondly, Aachen was the second most fortified city along the German West Wall, so its capture was required to breach the wall.[187] Finally, no major German city had yet been captured, so Aachen's capture had political value.[188]

The main Siegfried Line passed to the east, or behind, Aachen; however, a switchback in the line circled west of the city as well. So the battle of Aachen was mainly a First US Army action to breach the Siegfried Line and isolate the city.[189]

From 26 August through 14 September 1944, Allied forces conducted a pursuit across Europe from the Seine to the German border.[190] The First US Army, under LTG Hodges, tasked the XIX Corps to attack eight miles north of Aachen, to encircle the city and to make contact with the VII Corps which was attacking south of the city and turning north behind it.[191] The XIX Corps began their envelopment on 2 October. In the next two weeks, their progress was only six miles.[192] On 11 October, the Germans refused an ultimatum to surrender.[193] Because of this refusal, the US Air Corps dropped 172 tons of bombs on Aachen and the two corps artillery placed 169 tons of shells on Aachen during the next three days.[194] Finally, on 16 October, the two corps completed their double

envelopment and met northeast of Aachen.[195] Several unsuccessful attempts were made by elements of twelve German divisions to breakthrough the envelopment.[196]

On 13 October, elements of the 1st US Infantry Division, of the VII Corps, entered the city. On 21 October, the German garrison surrendered. Within the city itself, the 1st Division captured 3,473 prisoners. The 26th Infantry Regiment, of the 1st Division, which had done the major portions of the fighting, suffered 498 casualties of which seventy-five were killed and nine were listed as missing in action.[197] During the entire envelopment campaign, the First US Army suffered nearly 10,000 casualties.[198]

As a result of Aachen and the attempt to turn Aachen's flank in the Hurtgen Forest coupled with Hitler's Ardennes Offensive, it was four months until the Allies were ready to start moving out of Aachen and into Germany once again.[199]

Task Organization

The 30th Infantry Division was still engaged north of Aachen when the 2nd and 3rd Battalions of the 26th Infantry Regiment entered Aachen on 13 October. These two battalions faced wide frontages with little reserves. Their plan was to methodically clear the city building by building.[200]

Both battalions of the 26th Regiment were similar in task organization. The 2nd Battalion had a tank platoon, a tank destroyer platoon, an antitank gun platoon and one 155mm gun. This battalion task force was in turn organized into three small company teams with each infantry company having either three tanks or three tank destroyers, two 57mm antitank guns, two extra bazooka teams and two heavy machine guns.[201]

The 1106th Engineer Group also took part in the Aachen operation. Its mission was to block the southern approaches to the city. It also conducted several feints into the city. Later in the action, the Group moved a battalion northward to make contact with the 2/26th Infantry. The Group had the mission of general engineer support and conducted limited clearing operations and rubble removal in Aachen but did not conduct any combat missions. This hampered the combat force because of the lack of immediate engineer support.[202] The problems caused by the rubble in the streets could have been eliminated by attaching engineers at the company or platoon level within the battalions of the 26th Infantry.[203]

Although the plan was to clear each building before entering the next, the large city area and the nature of the defender created problems for the US battalions. They moved forward too fast and invited attack from the rear, which occurred.[204] This problem could have been solved by the use of reserves, however, there were no reserves available.[205]

The use of the 155mm guns were instrumental in quickly causing surrender. The German Commander, COL Wilck, observed on his capture that "when the Americans start using 155mms as sniper weapons, it is time to give up."[206] The 155mm guns were often fired with delay fuzes so that one round would penetrate several buildings.[207]

The battle for Aachen had many traits in common with other urban engagements. It had begun as the termination of a pursuit.[208] The defense forces were relatively weak for the task at hand.[209] Insufficient time was available for the defender to establish a good defense-which is a credit to the speed of the attackers.[210] At Aachen, as in most urban engagements, the exchange ratio favored the attacker.[211] General Koechling, the German corps commander, noted that "the great profit is laying

less in the capture of Aachen, but herein that in the sector of the corps the West Wall had been pierced."[212]

Aachen clearly demonstrated and documented the requirement for a combined arms team of armor, infantry, engineers and direct fire artillery. As the referenced works noted, the presence of engineers would have speeded the capture. The requirement for large reserves is also noted. This has been the case in several engagements-and should be noted. The task organization developed in this section and protrayed in chapter 4 should be used when tempered with the knowledge that these were not the best task organization possible-as viewed from the combatant's perspective.

SINGLING (18)

LTG Fritz Bayerlein, commander of the elite German Panzer Lehr Division, witnessed what he called "an outstanding tank attack, such as I have rarely seen, over ideal tank terrain."[213] This attack was made by LTC Creighton W. Abrams' 37th Tank Battalion towards the town of Singling in Lorraine.

LTC Abrams' mission was to attack Bining, Rohrback and to reconnoiter the high ground to the north. Near these two adjoining villages was Singling. It was a small village of fifty buildings that was located on dominant high ground to the east of Rohrback. This made it prudent to secure Singling before attacking Rohrback.

The attack plan was to have Team B, which included B/37th Tank Battalion and B/51st Armored Infantry Battalion, take Singling while the rest of TF Abrams continued on to the north and then swung east to capture Bining and Rohrback.[214] TF Abrams included the 37th Tank

Battalion, the 81st Armored Infantry Battalion, the 94th Artillery Battalion (105mm) and B Company, 704th Tank Destroyer Battalion (less one platoon).[215]

Because of its geographical location, Singling was the focal point in the secondary system of Maginot Line forts. The fifty old, stone farmhouses in Singling often had wall three feet thick. The farmyards and gardens surrounding the village also included high and thick stone or reinforced concrete walls. The village stretched for one-half mile along a dirt road. The center of town was dominated by a simple church and a schoolhouse.

The German defenders had constructed concrete pillboxes covering the east and west entrances to the village and had also located several concrete pillboxes on the northern hills and to the ridge to the south.[216] Singling was defended by the 1st Battalion of the 111th Panzer Grenadier Regiment of the 11th Panzer Division. Four companies of this battalion were supported by two self-propelled artillery pieces and five batteries of the 119th Artillery Battalion (twenty 105mm howitzers), other elements of the 11th Panzer Division Artillery and five battalions of the 208th Volks Artillery Group which had guns ranging up to 210 mm. The 1/111th Regiment was depleted to only 175 men, but they were well armed. Among the battalion were one towed 75mm antitank gun, three 20mm antiaircraft guns, one heavy machine gun, five 81mm mortars, nine light machine guns, and an improvised rocket launcher capable of firing two 200 pound projectiles simultaneously. This defending force was actually four to five times as large as the Team B which was to attack Singling.[217]

As previously mentioned, the plan was to move towards Singling, secure it with Team B and then cover the movement to the east by the rest

of Task Force Abrams with smoke and fire from the tank destroyers, tanks and artillery battalion. The 37th Tank Battalion was low in effective strength with only the equivalent of two medium tank companies. The 51st Armored Infantry Battalion had only 180 combat effectives. Team B received fourteen tanks and fifty-seven infantrymen for its mission.

At 0830 on 6 December 1944, B and C Batteries of the 94th Artillery Battalion began firing smoke concentrations north and east of Singling. A total of 131 rounds were fired which created a good smoke screen. Company A, 37th Tank Battalion, was leading the task force as it moved out of its assembly area. It was soon stopped by heavy fire from the direction of Singling. Team B was next in the task force column and was followed by B/37th Tank Battalion and the remainder of the 51st Armored Infantry Battalion. Both Team B and A/37th Tank Battalion were firing into Singling. The smoke, however, worked both ways; neither side could see its opponent to take aimed shots.

Convinced that Singling could not be neutralized by fire, LTC Abrams ordered Team B into the village while the rest of TF Abrams was to swing on towards Bining.

At 1015, Team B began the move into Singling preceded by 107 rounds from A and B Batteries of the 94th Artillery Battalion. As the tanks of Team B with their mounted infantrymen reached a hedge just south of town, the infantry dismounted and began to sweep into the village. During the course of village fighting, the infantrymen were stopped by a six foot tall wire fence.[218] The close construction of the buildings required that several holes be blasted by 105mm howitzers firing directly into the buildings. These gaps permitted infantrymen to pass through and they also served as semi-protected firing sites for the tanks.[219]

Many of the German positions were too well covered by fire to be directly assaulted by the tanks. In discussing how to attack those positions, the officers concluded that the indirect artillery fires "could not be brought down without endangering friendly troops."[220] Mortar fire was deemed to be fine but no mortars were available due to casualties in the mortar squad. Thus direct fire by tanks or artillery was the answer.

About the time that Team B had moved to the square in the center of Singling, a German counterattack appeared to be forming north of the village. An intense artillery concentration followed for five minutes. It became apparent to the attackers that "with the small force at their disposal and against an enemy who had at least equal strength and terrain advantage, they could not hope to secure their position in town by attack."[221] The team then assumed a defensive posture and waited for reinforcements from TF Abrams.

At noon on the 6th, LTC Abrams reported that his infantry and tanks were in Singling and he was "ready to turn over to them (the 8th Tank Battalion) their objective - without a fight."[222] This statement, of course, was in error, but at the time he thought it was correct. On that basis, the 8th Tank Battalion decided to send C/8th Tank Battalion and B/10th Armored Infantry Battalion into Singling. About 1400 the relief started. This relief was hampered by strong enemy counterfire which destroyed one tank and forced the rest of B/10th Armored Infantry Battalion to withdraw to the reverse slope of the ridge south of town. LTC Abrams "began to worry " that the relief was progressing too slowly and eventually ordered Team B to leave Singling immediately.[223] It was nearly dark when the last elements of TF Abrams left Singling. B/10th

Armored Infantry Battalion was now alone in Singling. Because the tanks of the 8th Tank Battalion were still on the reverse slope of the southern ridge, their task force commander decided to withdraw the infantry from the village also. Immediately after their withdrawal, the corps artillery placed a heavy time-on-target (TOT) concentration on Singling. This did extensive damage to the village.

The next morning, the 8th Tank Battalion started into Singling again but was halted by word of a momentary relief. They were finally relieved by elements of the 12th Armored Division on the evening of 7 December. The 12th Armored Division finally took Singling on 10 December.

TF Abrams lost six killed, sixteen wounded with five medium tanks destroyed. The known German losses were fifty-six prisoners and two Mark V tanks. The official history noted that "the action at Singling opened the way for later advances by the 12th Armored Division."[224]

The attack was impromptu, against heavy odds, and was a tactical stalemate. Several observations, however, are apparent from this action. The requirement for engineers and direct fire artillery is clearly evident. The task organizations used in this engagement must be tempered with this recognized deficiency in the data analysis.

SAN MANUEL (19)

San Manuel, Luzon, Phillipine Islands was the first small Phillipine town that was encountered by US forces. San Manuel was strongly defended by infantry, armor and artillery. Its capture provided several lessons which US forces were to use in the capture of other towns

on Luzon such as Munoz, Lupao and San Jose.[225] Figure 6 provides the location of Luzon and San Manuel.

The Japanese defenders were under the command of a major general with orders to use his 800 infantry and armor troops to the death.[226] The force included forty medium and five light tanks, six 105mm howitzers, seven 75mm cannon, two 47mm antitank guns, fourteen machine guns and nine knee mortars.[227] This Japanese force was disposed within the town except for one squad which was posted 2000 yards to the northeast to serve as a listening post.

The town was carefully prepared for defense. The three square mile town was roughly square in shape and bordered on the east by a steep banked stream and on the north and south by drainage ditches.[228] Along the west side of town, there was a rice patty. Peep holes were bored through the rice paddy's dike to permit observation of the advancing forces. At other locations around the town, thick bamboo growths of twenty to thirty feet thick halted all movement. Seventy-five tank positions were constructed and camouflaged around the town. During the course of the battle, the Japanese often hid in the numerous foxholes they had also constructed throughout the town and reappeared to attack units from the rear or else to attack the main body after the reconnaissance elements had passed.[229]

The 1st and 2nd Battalions of the 161st Regimental Combat Team (RCT) were supported by C Company and one platoon from D Company, 716th Medium Tank Battalion and D Company, 98th Chemical Mortar Battalion. The entire 25th Division Artillery provided back-up support for the operation. One battery of the 168th Field Artillery Battalion (155mm) was a corps unit reinforcing the division at that time.[230]

Figure 6. Urban Engagements in the Phillipine Islands

On the morning of 24 January 1945, the 2/161st RCT moved towards the west side of San Manuel. After a small penetration, they were rebuffed and withdrew. This attack indicated a need for better antitank protection and better fire support. After a reorganization that placed infantry with tanks and brought forward two platoons of 105mm guns and two platoons of 37mm antitank guns, the battalion advanced again at 1700 under cover of two battalions of 105mm indirect fire. It secured a limited objective on the northwestern corner of town. During the next two days, this force moved south and took a bridge in the southeastern part of town.

Coincident with the 2/161st RCT's attack, the 1/161st RCT advanced towards the southwestern corner of San Manuel. The same problem of insufficient tank protection occurred. During the day, six medium tanks were destroyed. At dusk, the force withdrew 200 yards outside of town and conducted intensive patrolling to determine the enemy disposition for the next two days.[231]

On 27 January, the 1/161st RCT relocated with the successful 2/161st RCT and under cover of two battalions of 105mm fire, advanced on the southern half of the town. The initial advance was only one hundred yards into town. At 0100 on 28 January, the Japanese launched a vicious counterattack. They penetrated about fifty yards into the US position but were brought to a halt through attrition. The will to resist had been broken and the Japanese withdrew from San Manuel.

US losses included nine officers and one hundred and one enlisted men killed in action, five of which were company commanders. Eleven officers and one hundred twenty-seven enlisted men were listed as wounded in action. The Japanese force was nearly annihilated.[232]

The US commander noted that the M-7 self-propelled howitzer was very effective in this urban fighting. The tank also was very valuable and was particularly useful in crossing the open approaches to the town. He also noted that the 155mm fire was the minimum necessary to achieve results against a fortified environment. He also observed that many isolated firing positions tended to break up units, so he recommended that only company sized or small units be used in sectors in city fighting because larger units tended to break up and to loose control.[233]

Nothing of an original nature was discovered at San Manuel. What is interesting is that the same lessons are being relearned two years after other US Army unit learned them in other theaters. The absence of tanks is realistic in view of the terrain. The town was surrounded on three sides by large ditches and with dense bamboo growth in other areas. Thus it is reasonable for the tank to be missing.

MANILA (20)

For twenty days in February 1945, the US Army fought the Japanese in a large urban environment. Prior to this time, the Japanese had not conducted any extensive defenses of large cities. For instance, Rangoon was yielded without a fight and only a delaying action was undertaken at Mandalay. Several smaller Phillipine towns were defended but not to the extent nor with the determination that Manila was.[234]

Manila spread for 110 square miles. It had many varied types of construction ranging from miles of tree bordered boulevards lined with large municipal buildings, universities and churches to vast areas of clustered slums. The Pasig River cut through the center of Manila and formed a natural boundary. Immediately south of the Pasig was the old

Spanish walled city of Intramuros. The Intramuros walls were sixteen feet high; forty feet wide at the base and twenty feet wide at the top.[235] Inside of Intramuros was Fort Santiago, a stone walled fort constructed by the Spanish in 1590. South of the Intramuros was the concentration of government buildings, larger residential dwellings and many parks.[236] Because Manila lies in an earthquake zone, most of the buildings were of large and substantial earthquake proof construction.[237]

The Japanese Army commander, General Yamashita, originally planned to delay along the Pasig River, destroy targets of military value and then withdraw into the mountains for a prolonged defense. However, the Naval Admiral given command of the Manila forces, Admiral Iwabuchi, decided that Manila provided the opportunity for considerable delay and attrition of the US forces.[238]

Japanese strength was around 18,400 men. This was made up of 12,000 Naval personnel and 4,400 Army troops.[239] Because of the composition of the force, very few regular infantry weapons were present. This caused no real problems, however, because all available automatic weapons were stripped from unserviceable aircraft and naval craft and used in the defense.[240] Extensive use was made of both controlled and uncontrolled minefields. The fields included both standard as well as non-standard mines such as artillery shells and bombs.[241] Roadblocks were also effectively employed. These roadblocks were extensive in depth and often one individual roadblock was as much as one city block in length.[242] The defensive positions were sited for coordinated fires, however, no escape routes were evident. It was apparently the plan to have the defenders die in their positions.[243] The major error in the defensive positions was that they all faced predominantly south because

that was the anticipated direction of the attack.[244]

The attack plan of the XIV Corps Commander, MG O.W. Griswold, was to attack from the north with the 37th Infantry Division and the 1st Cavalry Division abreast. The 11th Airborne Division would attack from the south and clear north to the Pasig River when the two forces would meet. After intelligence revealed the unexpected siting of the enemy defensive positions facing south, the plan was changed to include one regiment of the 37th Division crossing the Pasig River and attacking straight south while the rest of the 37th Division and the 1st Cavalry Division moved to the east then crossed the Pasig River and attacked the Intramuros.[245]

In order to spare the city and its population, General MacArthur placed stringent requirements on the use of weapons. The casualty rates began to drastically increase under this plan so the restrictions were relaxed to permit direct fire by tanks, tank destroyers and 4.2 inch mortars. Finally, restrictions were lifted and field artillery support was employed.[246]

Between 30 January and 4 February, "flying columns" of the two northern divisions quickly moved into Northern Manila, bypassed resistance and quickly secured key objectives including the release of prisoners of war located at Santo Tomas University.[247]

As the northern divisions crossed the Pasig River and turned towards the west, the encirclement of the city was completed on 11 February when the 11th Airborne Division met the 1st Cavalry Division.[248]

From the 12th through the 22nd of February, the units conducted operations to eliminate strongpoints and to consolidate their gains. Most units, except the 37th Division, received new missions outside Manila.[249]

The reduction of Intramuros began on 23 February and lasted until 3 March. To support the 37th Division in this assault, a tank destroyer battalion, a tank company, and a brigade of the 1st Cavalry Division were attached.[250]

At H-Hour minus sixty minutes, 0730 on 23 February, the artillery reduction of Intramuros began. A time-on-target concentration of seven battalions of 155mm, one battalion of eight inch, one 240mm battalion, one tank battalion and one tank destroyer battalion descended on the walled city.[251] During the one hour of firing, the eleven battalions fired 7,896 rounds totaling 185 tons was put on the small area.[252] Of the seven artillery battalion (155mm), thirty-six guns were used in the direct fire mode on the walls.[253] This concentration was sufficient to create holes in two different portions of the wall.[254]

At 0830, a red smoke round signaled the launching of assault boats carrying two infantry regiments across the Pasig River. They ..d the walls without a casualty. They completed initial control over Intramuros on the next day.[255]

The brigade from the 1st Cavalry Division continued its operation in the city and concluded the Manila fighting with very hostile fighting among the many government buildings. Finally on 4 March, Manila was in US hands.[256] The Japanese cost was 16,665 dead.[257] The US losses were 1,110 killed and 5,565 wounded.[258]

Task Organization

None of the sources checked provided exact guidance on how the lower level units were task organized. The Sixth Army Combat Notes reported:

"Street fighting in Manila followed the tactics outlined in FM 31-50, and, in general, the principles applied were orthodox. Platoon leaders organized assault teams equipped with bazookas and demolitions...heavier assault weapons such as flamethrowers, were kept with the platoon headquarters group, available on call. The size of the assault group was varied as required by the situation. Automatic weapons were employed in the support role to keep openings and entrances under fire while the assault units closed in on the buildings. Mortars were employed to provide screening smoke. In all cases, it was found advisable to reinforce units immediately after effecting entrance into a building."[259]

The XIV Corps report also notes that:

"Squads were organized into small assault teams with bazookas and demolitions. These assault teams proved invaluable in capturing the fortified buildings just outside Intramuros."[260]

The USMA text on this portion of World War II observed that:

"In Manila, the fighting continued house to house and street to street. Most of it followed the same pattern: A strongly fortified structure was first subjected to point blank artillery fire from pieces ranging in size from 75mm to 155mm howitzers; troops would then assault the building, using small arms, grenades, flamethrowers and drums of gasoline ignited by thermite."[261]

The role of armor as an indirect fire weapon was mentioned. It was used in this role while the tanks were in reserve. The Sixth Army noted that armor should be held in reserve and not necessarily be exposed to antitank fires. They noted that tanks were not suited for bulldozing or crushing tasks.[262] In all cases, the report advised that tanks must be protected by infantry troops accompanying them.[263]

The Manila fighting reinforced many lessons that the Army had already learned in other engagements. Sufficient data is not available to permit a thorough analysis of the task organizations used in Manila.

REMAGEN (21)[264]

In late March 1945, the 7th Armored Division was moving across Germany after breaking out of the Remagen bridgehead. Each of the three combat commands were moving forward in parallel routes capturing German

villages and towns. Often these routes would be changed to keep the Germans guessing as to the next village to be attacked.

TF Griffin was one of the three task forces of Combat Command B of the division. The task force included an armored infantry battalion headquarters, its service company, one armored infantry company, one medium tank company, one light tank platoon, one tank destroyer platoon, one engineer squad, one 105mm artillery battalion and one tactical air control party.

The method of operation was to dispatch the light tank platoon and the assault gun platoon from the battalion headquarters down the road to reconnoiter the next town. Outside the town, loudspeakers would call on the mayor to surrender the town or have it shot up by the tanks and artillery. After the surrender, the mayor was taken along to encourage the next town to surrender.

This procedure worked fine for the first two towns approached on 29 March, but the third town, Burgeln, was different. The mayor, who was sent to the town ahead of the forces, did not return. The task force commander sent his light tank platoon forward to reconnoiter the small town of forty two-storied buildings that lay along a 1200 yard stetch of road. Three light tanks were quickly lost to antitank fire. The remaining force dispersed and began firing until the rest of the task force arrived.

The main body deployed and took the town under fire with both tanks and artillery. The armored infantry company was deployed and after a two hour fight, the town was secured.

This engagement redemonstrated the requirement for infantry support of armor. Had this been done, perhaps the light tanks would

not have been lost. This task organization must be viewed in the context of a special task organization used for a specific purpose of capturing villages.

[illegible] [illegible][illegible]

In April 1945, the 6th Armored Division advanced across what is now East Germany. The division had two combat commands, A and B abreast with C in reserve. The division front averaged fifteen kilometers wide with each combat command having about a seven to eight kilometer front.[266] Combat Command A was armor heavy with two armor battalions and one armored infantry battalion. Combat Command B was just the reverse with two armored infantry and one armor battalion. Two artillery battalions supported each command. Table [illegible] shows the exact task organization of these units.

Combat Command	Bn. Headq.	Tank Co	Inf Co	Tank Des. Plt	Engr Plt	Arty Bn
A	15th Tank	2 med 1 lgt	1	1	1	1
A	6th Tank	2 med	1	1	1	
A	44th A.Inf	1 med	1	1	1	1
A	50th A.Inf	1 med	1	1	1	1
A	[illegible]th A.Inf	1 lgt	1	1	1	
B	68th Tank	2 med 1 lgt	1	1	1	1

Table 1. Task Organization of CC A and B, 6th Armored Division, [illegible] April 1945.

After crossing the Werra River on the night of [illegible] April, the 6th Armored Division was ordered to take Muhlhausen. The division

population was around 30,000 and its organized defenders numbered about 1,000. The defending German soldiers were found to be well equipped and had excellent morale for this stage of the war.

The plan to secure Muhlhausen called for an encirclement and then the reduction of the town. To achieve this, CC A assembled four kilometers west of the city while CC B assembled five kilometers southwest of Muhlhausen. Leaving their assembly areas simultaneously on the morning of 4 April, CC A and CC B began the encirclement operation. TF 15, on the north, made a wide sweep north then turned east and finally back to the west to approach Muhlhausen from the east. TF 68, the next unit to the south of TF 15, made a similar sweep to the north, then east and south to approach the town from its north side. TF 9 and TF 50 approached from the west and halted two kilometers west of Muhlhausen. TF 44 and TF 69 made a sweep to the south and then turned north and finally west. TF 44 approached the town's south side while TF 69 continued the sweep and moved into blocking positions facing east to block any reinforcements for the town. The city was now completely surrounded by dusk of 4 April.

At 0700, 5 April, the division commander launched his attack. All task forces kept their positions except for TFs 9 and 50 which had halted west of the town the preceeding day. They drove into the town from the west heading directly east. The fierceness of this attack coupled with the previous day's encirclement had disrupted the German commander's plans. Only sporadic street fighting occurred. Between three and four hundred prisoners were taken in Muhlhausen and another 1200 were captured by the encircling forces as the Germans tried to flee eastward. By 0930, that morning, the town was cleared with minimal

friendly losses.

This brief vignette portrays the classical approach of isolating the town and then reducing it. The task organization is that of a normal division moving across open terrain. The use of infantry heavy units in the urban environment is doctrinal. Thus Muhlhausen appears to be a fine example.

CHAPTER 4

DECISION REFERENCE CRITERIA

This thesis hypothesizes that history can be used as a guide in determining a task organization for urban warfare. This chapter will reduce the detailed combat actions described in chapter 3 to clear and easily used guidance for a task organizer to use in tailoring his force for urban engagements.

Chapter 2 presented two methods of classifying urban terrain. Both systems, the Soviet and the US, used population as the basis of classification. To provide a reference point for further analysis, all the villages, towns and cities mentioned in Chapter 3 have been classified by both systems and are listed in table 4. The exact population was difficult to determine. The figures used to represent the population are the best prewar figures available.

Chapter 3 presented both a small vignette of the combat action and a view of the task organization used. These task organizations were stated in terms of total forces available in an action or else stated in terms of a small unit organization. For instance, forty-eight infantry battalions are listed as being available at Poznan while the data presented for Breslau uses a mix of one infantry company, one tank, one-half of an engineer platoon and two to three artillery pieces. Whatever, the task organization stated, it is portrayed in table 4. For those combat engagements where lessons were noted but no specific task organization was stated, the appropriate rows and columns are left blank in the table.

ENGAGEMENT NUMBER	LOCATION	EST. POP	CLASSIFICATION SOV.	CLASSIFICATION US	FORCE TYPES INFANTRY	ARMOR	ENGINEER	ARTILLERY	TANK DEST.	ANTITANK
1	Sevastopol	122,000	Large	City						
2	Stalingrad(German Attack)	400,000	Large	City	6 Div		5 Bn			
3	Stalingrad(Soviet Attack)	400,000	Large	City						
4	Velikie Luki	49,000	Small	Town			0.15%			
5	Rzhev	39,000	Small	Town	1 Plt	1 Co	½ Plt			1
6	Poznan	300,000	Large	City	48 Bn			5 Bde		
7	Keonigsberg	168,000	Large	City	1 Co	1-2	1 Plt	5		
8	Glogau	1,200	Small	Vill.	1 Plt	2	10-12	2		
9	Breslau	320,000	Large	City	1 Co	1	½ Plt	2-3		
10	Berlin (1st Phase)	2,300,000	Large	City	1 Bn	1 Bn	1 Co	1 Bn		
11	Berlin (2nd Phase)	2,300,000	Large	City	1 Plt-1 Co	3-4	10	2-3 SP 5		
12	Berlin (Ideal)	2,300,000	Large	City	1 Bn	1-2 Co	1 Plt-1 Co	1-2 Bn 1 Hv Bty		
13	Ortona	7,600	Small	Town	3 Co	1 Co	1 Plt	1 Bn		
14	St. Hillaire	1,000	Small	Vill.	1 Bn	1 Recon.T 1 Lgt Co	1 Plt	1 Bn	1 Co	
15	Mayenne	7,300	Small	Town	1 Bn	1 Bn	1 Co		1 Co	
16	Laval	28,000	Small	Town	1 Reg	1 Bn 1 Rec.T.	1 Co	2 Bn	1 Co	
17	Aachen	165,000	Large	City	1 Bn	1 Plt		1-155	1 Plt	1 Plt
18	Singling	400	Small	Vill.	1 Bn	1 Bn		1 Bn	2 Plt	
19	San Manuel	Unk.	Small	Vill.	2 Bn	4 Plt		1 2/3 Bn		
20	Manila	810,000	Large	City						
21	Bergeln	Unk	Small	Vill.	1 Co	4 Plt	1 Sqd	1 Bn	1 Plt	
22	Muhlhausen(Surr. Terr.)	32,000	Small	Town	1 Co	2 Co	1 Plt	2/3 Bn	1 Plt	
23	Muhlhausen(Urban Envirn.)	32,000	Small	Town	2 Co	1 Co	1 Plt	2/3 Bn	1 Plt	

Table 4. Urban Engagement Data Tabulation

In order to compare the various task organizations, they must all be brought to one common denominator. This is done by developing ratios for various combinations of units. Four ratios are used in this thesis. There are armor:infantry, armor:maneuver, engineer:infantry, engineer:maneuver, artillery:infantry, and artillery:maneuver. The ratio of armor:infantry, for instance, is a statement relating the number of armor units to a like sized number of infantry units. In the case of Ortona, there are three infantry companies and one armor company. The resulting ratio for armor:infantry would be 1:3 or when reduced to lowest terms 0.33:1.

The term maneuver unit signifies the composite total of all maneuver units, i.e., infantry, armor or tank destroyer, that are present in that engagement. In the case of Mayenne, there is one infantry battalion, one armor battalion and one company of tank destroyers. The total number of maneuver companies is seven or three infantry companies, three armor companies and one tank destroyer company. So with one engineer company at Mayenne, the ratio of engineer:maneuver would be 1:7 or 0.143 when reduced to lowest terms.

This methodology is used to translate the numbers of table 4 into common terms or ratios. These ratios are presented in table 5. Table 5 is presented in lowest terms. For instance, the number of artillery:infantry units for Singling is listed as 1. This really means 1:1 or one artillery unit for each infantry unit. The type of unit could be either battery, battalion or platoon.

There are two assumptions that are required to translate the data from table 4 into table 5. First, it must be assumed that the units were at the same relative strength. For instance, an armor unit

ENGAGEMENT NUMBER	LOCATION	RATIOS OF VARIOUS TYPE UNITS					
		TANKS : INFANTRY	TANK : MANEUVER	ENGINEER : INFANTRY	ENGINEER : MANEUVER	ARTILLERY : INFANTRY	ARTILLERY : MANEUVER
1	Sevastopol						
2	Stalingrad(German Attack)						
3	Stalingrad(Soviet Attack)						
4	Velikie Luki			0.15			
5	Rzhev	3	0.75	0.5	0.125		
6	Poznan						
7	Koenigsberg	0.15	0.13	0.33	0.28	1	0.87
8	Glogau	0.66	0.4	0.5	0.3	1.51	0.3
9	Breslau	0.1	0.09	0.16	0.15	0.63	0.57
10	Berlin (1st Phase)	1	0.5	0.33	0.17	1	0.5
11	Berlin (2nd Phase)	0.58	0.37	0.25	0.16	2.84	1.70
12	Berlin (Ideal)	0.5	0.33	0.33	0.25	83	1.22
13	Ortona	0.33	0.25	0.11	0.08	1	0.75
14	St. Hillaire	0.66	0.4	0.11	0.067	1	0.6
15	Mayenne	1.33	0.57	0.33	0.143		
16	Laval	0.44	0.31	0.11	0.077	0.66	0.46
17	Aachen	0.22	0.18				
18	Singling	1.22	0.55	0	0	1	0.45
19	San Manuel	0.22	0.18	0	0	0.83	0.68
20	Manila						
21	Borgeln	1.66	0.62	0.11	0.042	3	0.38
22	Muhlhausen(Surr. Terr.)	2.33	0.69	0.33	0.11	2	0.66
23	Muhlhausen(Urban Envirn.)	0.66	0.4	0.33	0.11	1	0.66

Table 5. Force Ratios

operating at 60% strength in personnel and equipment must be matched with an infantry unit also at 60% strength for the relationship to be correct. The strength figures were not available for each unit in each of the combat engagements. There were four, however, that presented a sufficiently detailed personnel and equipment profile to make the determination that all units were relatively equal in attrition. This finding was then used as an assumption for those other engagements where the data did not reveal the equipment and personnel attrition unit by unit.

The second assumption necessary is that the same relative relationship exists between a Soviet tank platoon to its counterpart infantry platoon as does a US tank platoon to its counterpart infantry platoon. The organizations for the Soviet, US and Canadian units were checked. An analysis showed that the same relative relationships existed between one nations units as to another nations. Whereas the Soviets had different numbers of tanks in a platoon as well as different numbers of infantry soldiers than did the US, the number of tanks per soldier per platoon remained surprisingly constant across all nations. Accordingly, the assumption is made that the support provided by one nation's tank platoon to its infantry platoon has the same relative combat value as another nation's tank platoon support to its infantry platoon.

Data Analysis

To aid in developing the decision reference criteria, a series of graphs depicting the ratios of table 5 plotted against the urban classification is presented.

For ease of reference, the engagements numbers are listed on

the graphs next to their position. For instance, a number 16 next to a dot signifies that the dot represents Laval.

Chapter 4 presented a conclusion after most combat engagements. This conclusion pointed out the key aspect of the fighting and made various comments on the worth or validity of the data. These comments should be recalled when looking at specific data points to determine why they lie on, above or below a line. A reason was provided in those boxes that will explain the apparent abnormal behavior of certain data points.

Each set of numbers have been evaluated to determine if any trend or relevance can be made of their relative locations. To represent the trend of the data points, a line depicting an average value has been drawn. It must be pointed out that the exact location of the line, the exact shape of the line and the intercept points of these lines are all open to speculation. The lines depicted are the pure mathematical solution of regression applied to the number sets. For instance, rather than the data points representing a straight line, a step function could occur at a particular population size. This could not be determined with the data available. Accordingly, the lines drawn are the best representation that could be made of the data available.

Figure 7 depicts the relationship of tank units to infantry units. An exponential curve was determined to best fit the data. The sloping line shows that a decrease in force ratio occurs as the terrain becomes more urbanized. Thus a city will tend to use less tank units to support each infantry unit than will open countryside.

Figure 8 portrays the tank:maneuver unit line for various

urban locations. This line shows the same general trend as figure 7. When this relationship is stated another way, it can be said that one tank unit will have to support more maneuver units in the city than when in the countryside or involved in smaller villages. Thus if a tank battalion supported an infantry battalion in small village actions, it could have to support up to eight infantry battalions in a large city. The net effect is that it will spread itself much thinner.

Figure 9 depicts the relationship of engineer units to infantry units. The very small slope, or m, listed on the figure means that there is nearly the same number of engineers supporting an infantry unit regardless of the population of the urban area. This relationship, however, changes when one considers the engineer: maneuver unit ratios shown in figure 10. This graph shows that the number of engineers increases as a portion of the total force. In other words, more engineers are needed in an attacking force in a city than is needed in a small village.

Artillery units have the same pattern as engineers. Figure 11 shows that the artillery support per infantry unit remains relatively constant. This relationship changes in figure 12 when the artillery: maneuver unit ratios are observed. So more artillery units must be put in a force attacking a larger town than a smaller one.

Relationships

The relationship between the various units can be stated in simple terms. These relationships provide the initial guidance to be used by the task organizer.

These relationships are stated in various existing doctrine statements. Thus the historical precedents developed in this thesis

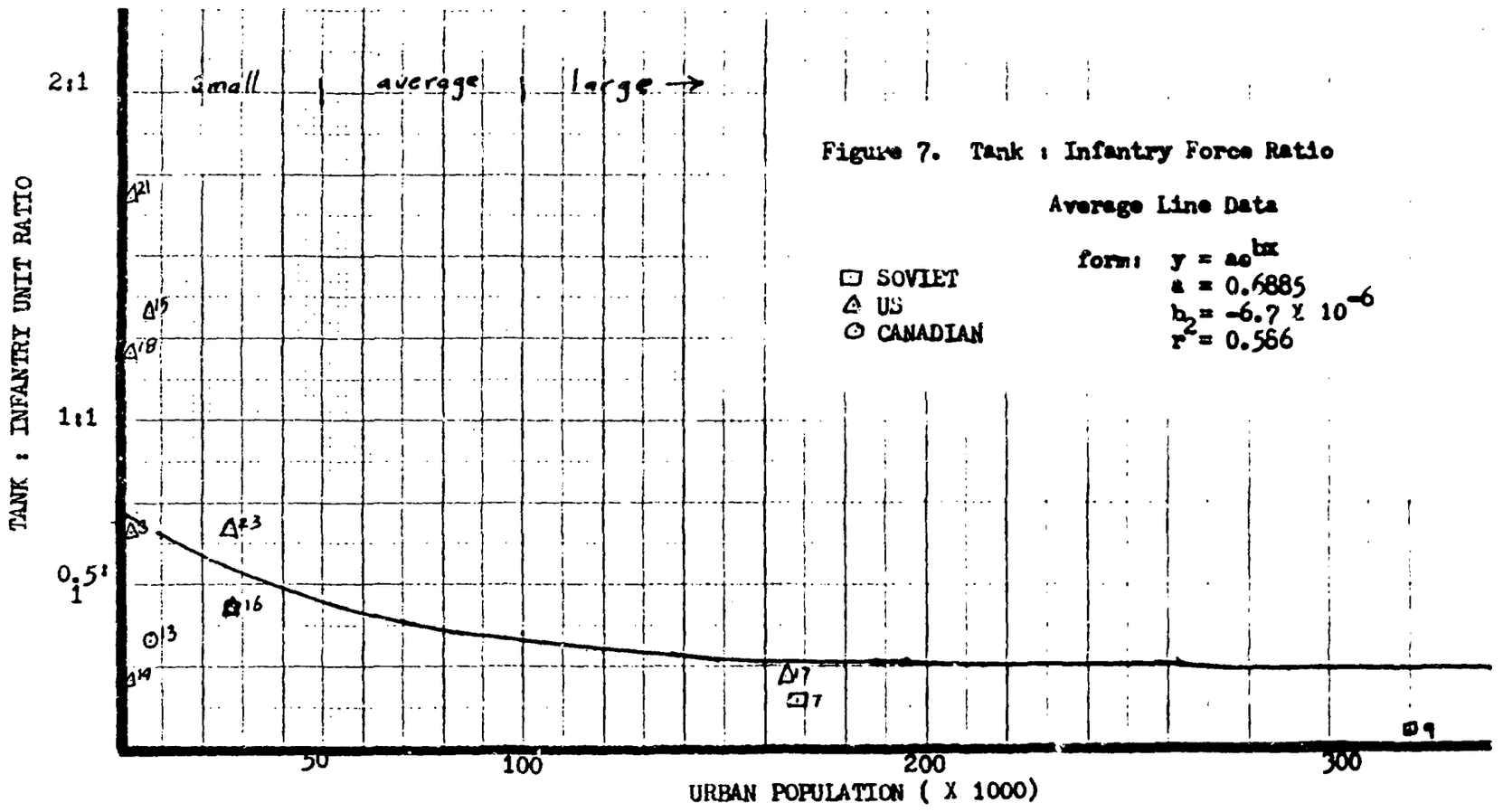

Figure 7. Tank : Infantry Force Ratio

Average Line Data

form: $y = ae^{bx}$

$a = 0.6885$

$b_2 = -6.7 \times 10^{-6}$

$r^2 = 0.566$

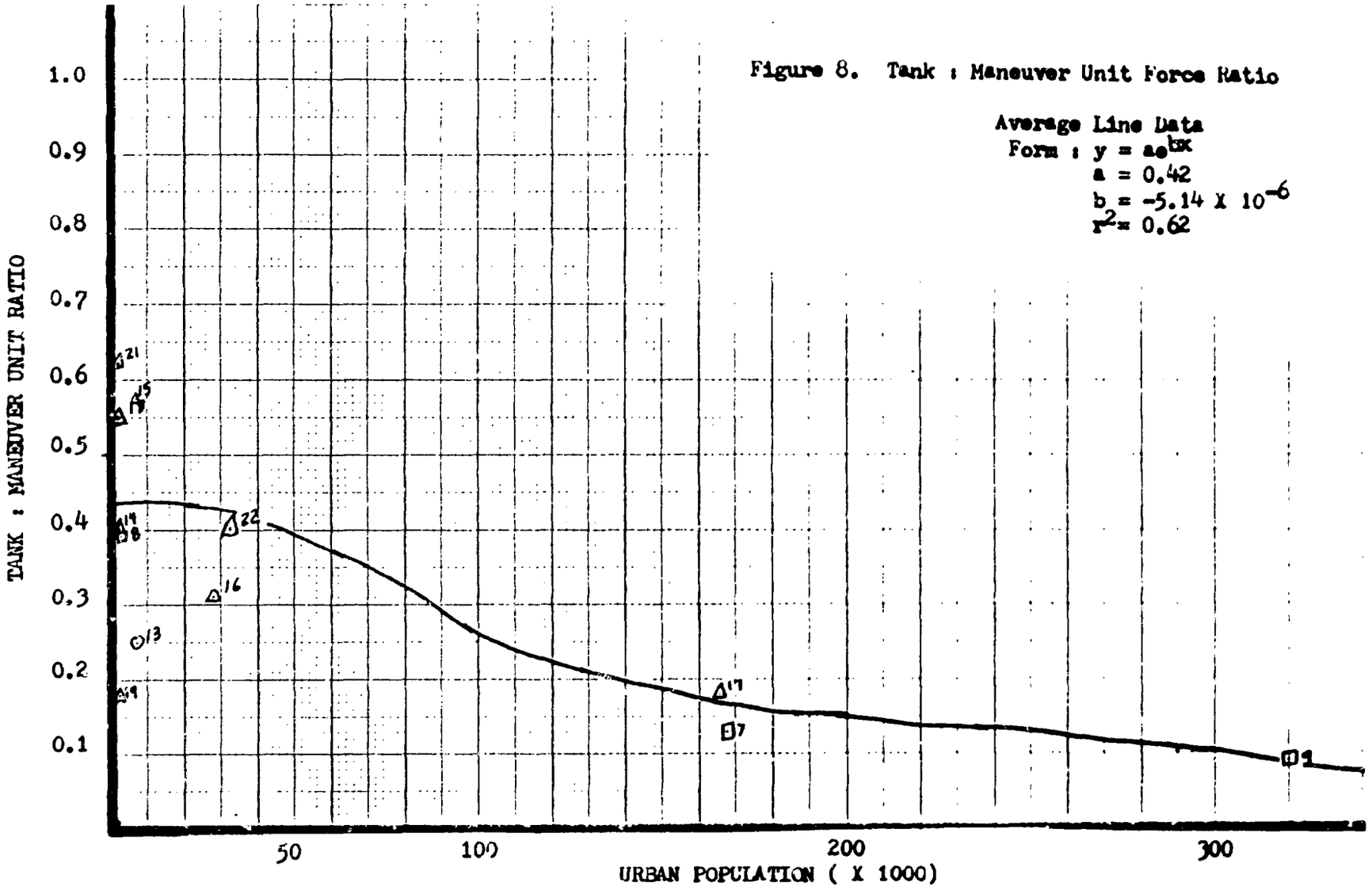

Figure 8. Tank : Maneuver Unit Force Ratio

Average Line Data
Form : $y = ae^{bx}$
$a = 0.42$
$b = -5.14 \times 10^{-6}$
$r^2 = 0.62$

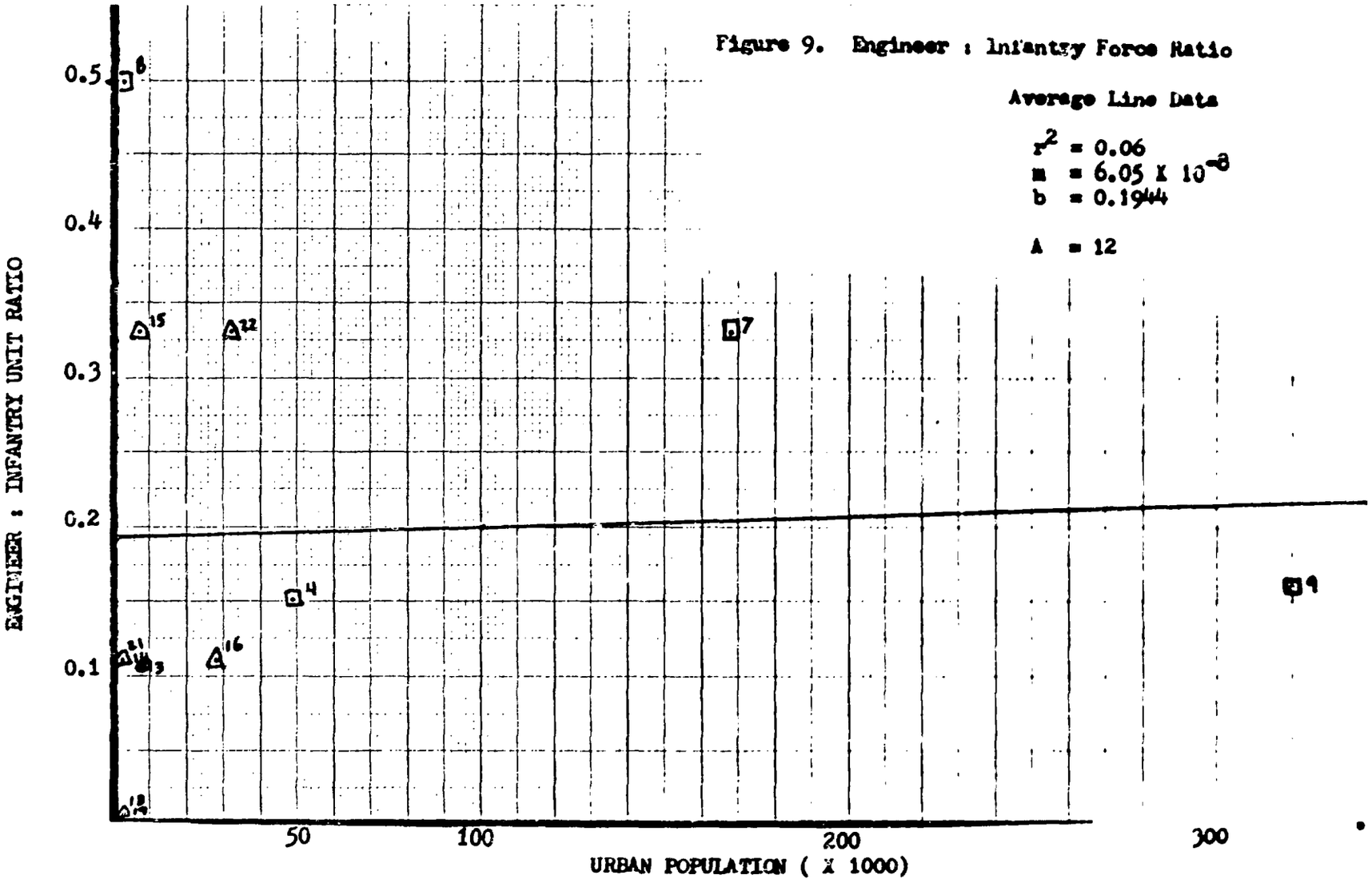
Figure 9. Engineer : Infantry Force Ratio
Average Line Data
r² = 0.06
m = 6.05 X 10⁻⁸
b = 0.1944
A = 12
ENGINEER : INFANTRY UNIT RATIO
0.5
0.4
0.3
0.2
0.1
50
100
200
300
URBAN POPULATION (X 1000)

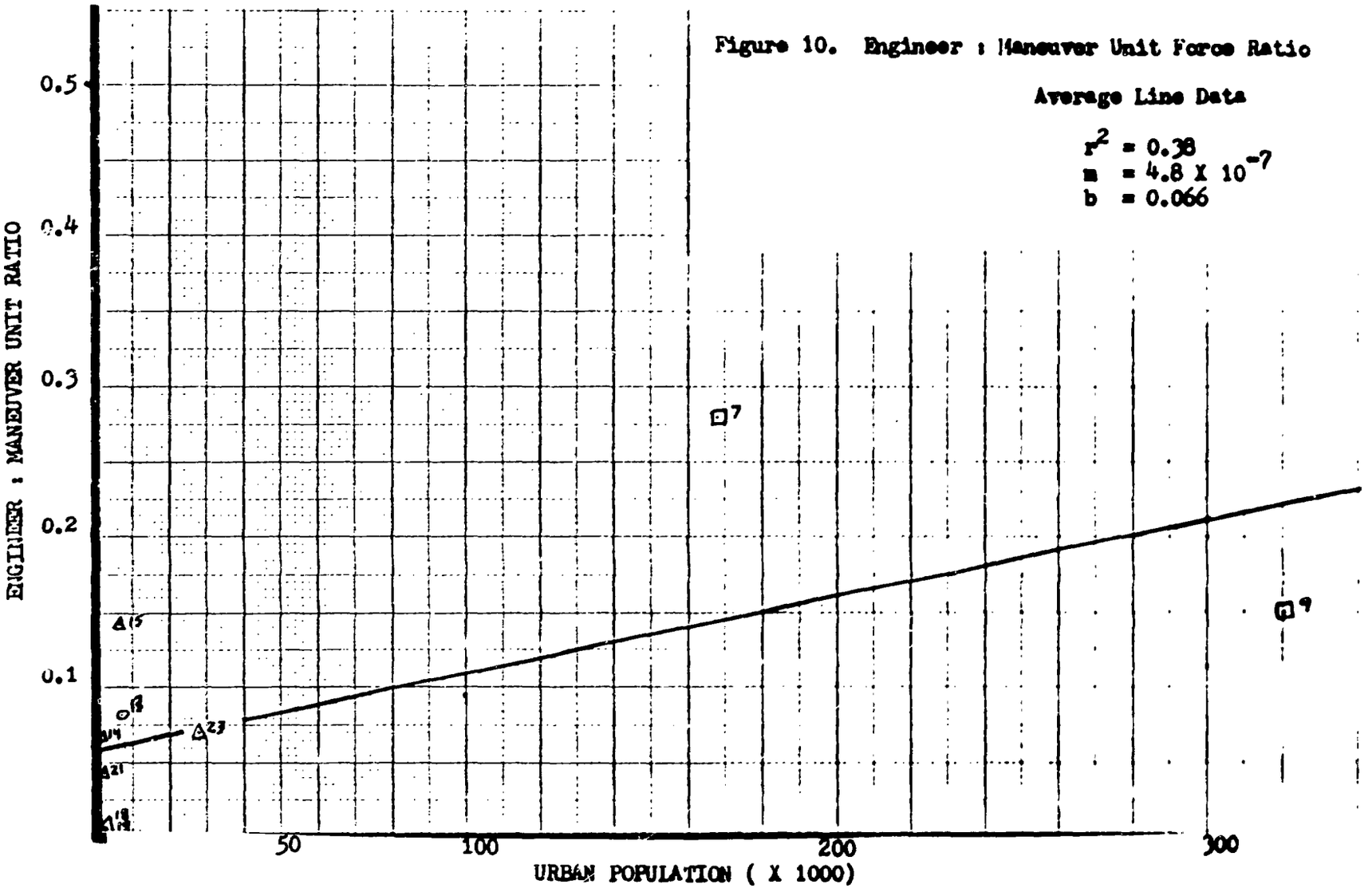

Figure 10. Engineer : Maneuver Unit Force Ratio

Average Line Data

$r^2 = 0.38$
$m = 4.8 \times 10^{-7}$
$b = 0.066$

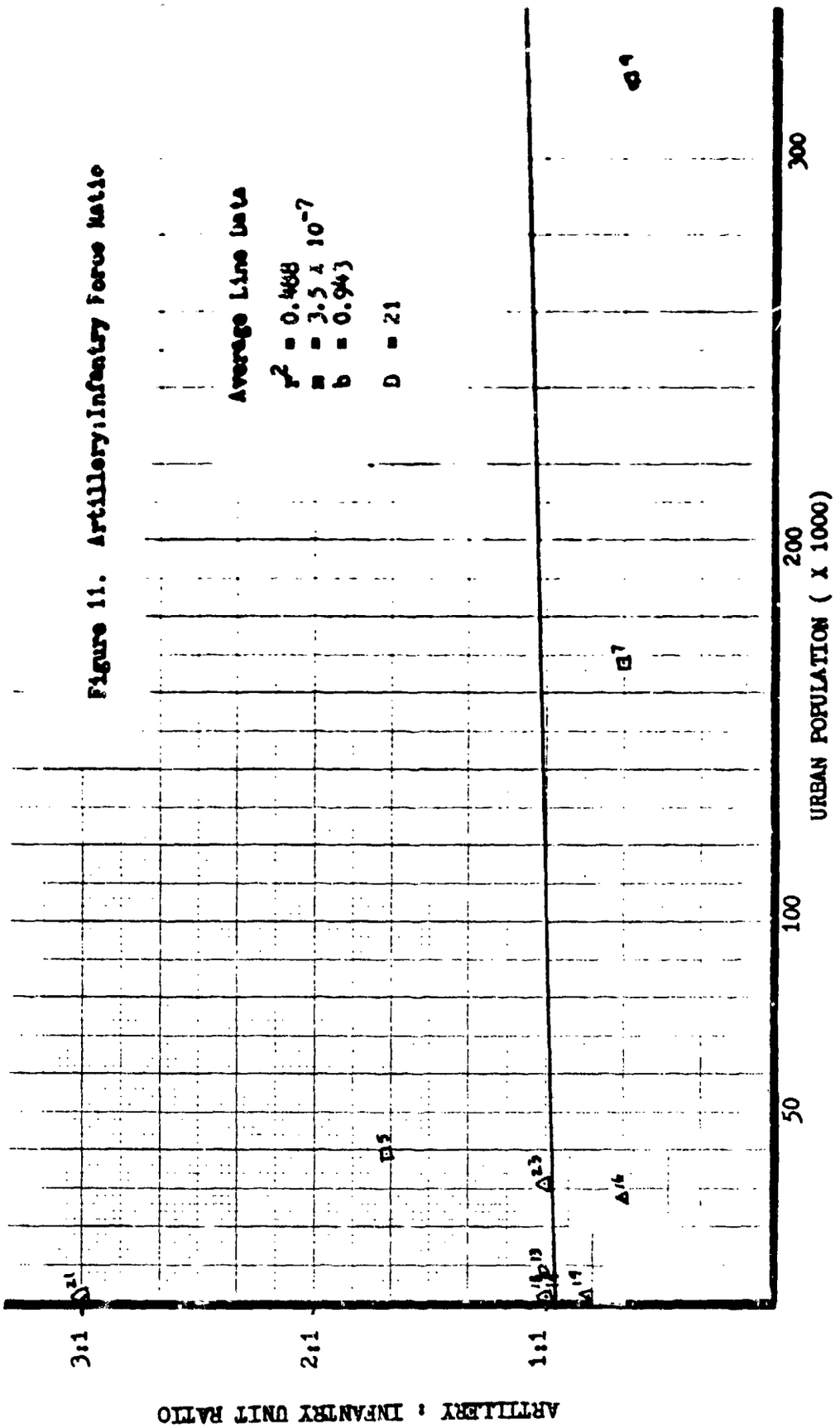
Figure 11. Artillery:Infantry Force Ratio
Average Line Data
r^2 = 0.488
a = 3.54 10^{-7}
b = 0.943
D = 21
3:1
2:1
1:1
ARTILLERY : INFANTRY UNIT RATIO
50
100
200
300
URBAN POPULATION (X 1000)

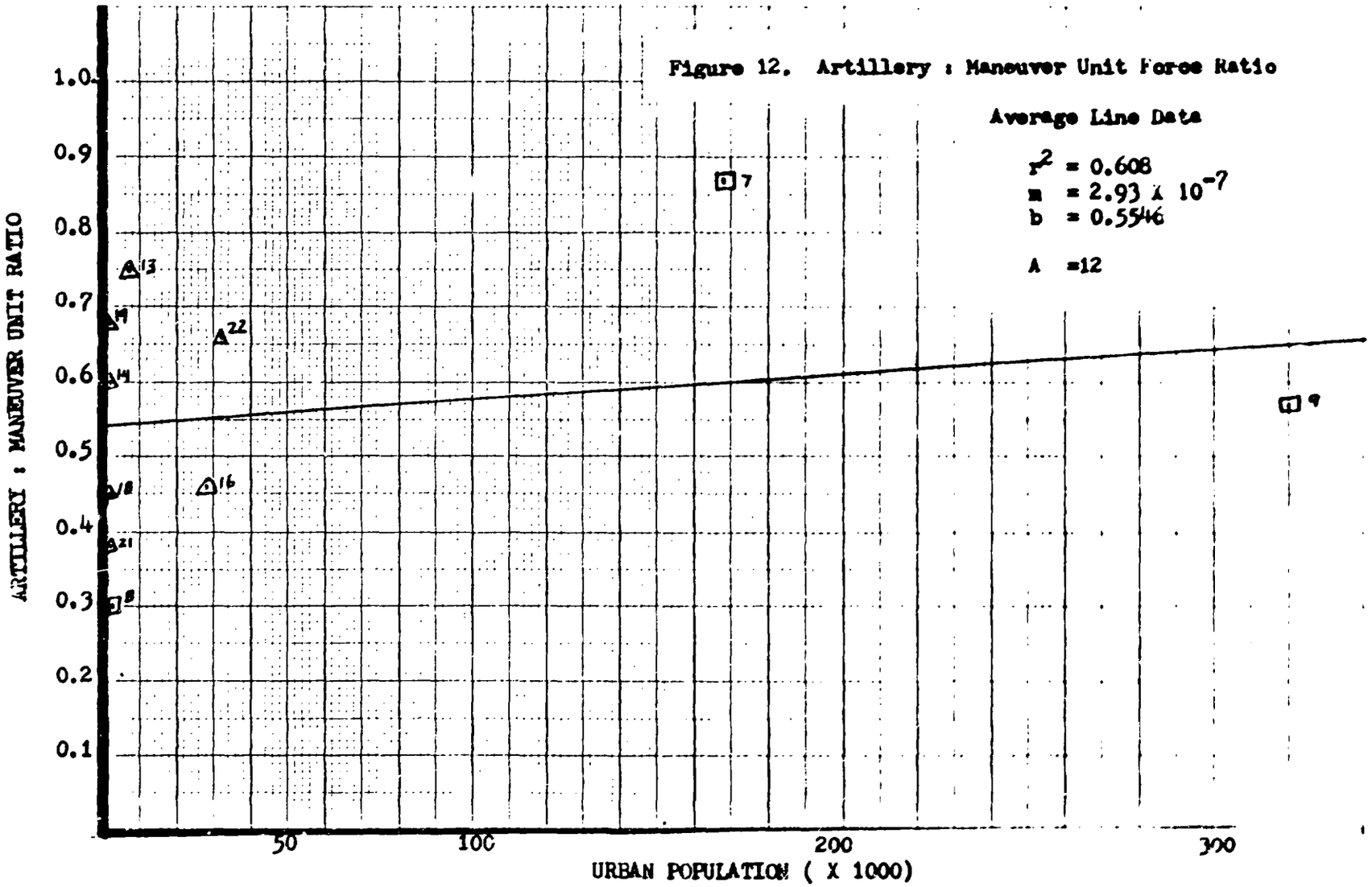
Figure 12. Artillery : Maneuver Unit Force Ratio
Average Line Data
r^2 = 0.608
m = 2.93 X 10^{-7}
b = 0.5546
A =12
ARTILLERY : MANEUVER UNIT RATIO
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
50
100
200
300
URBAN POPULATION (X 1000)

support the existing doctrine. This thesis, however, takes the next step and provides a numerical relationship between the types of units that were historically used in combat engagements in varying types of urban terrain.

The qualitative relationship developed from the graphs are presented in table 6. Table 6 should be read as : The use of (column) varies (per the box) in relation to (row) units. For instance, the use of engineers increased per maneuver unit as the terrain became more urbanized.

	TANKS	ENGINEERS	ARTILLERY
INFANTRY UNITS	decreases as urbanization increases	remains relatively constant regardless of terrain	remains nearly constant for varying terr.
MANEUVER UNITS	decreases as urbanization increases	increase as % of maneuver force as urbanization increases	increases % of maneuver force as urbanization increases

Table 6. Unit Relationships

These relationships can be succinctly stated as:

a. Tank use decreases as urbanization increases.

b. More engineers are needed as urbanization increases.

c. More artillery is required as urbanization increases.

d. Both engineer and artillery units have the same relationship with infantry units regardless of the degree of urbanization.

e. The percentage of both engineer and artillery units in the maneuver force increases as urbanization increases.

The fact that these qualitative conclusions are supported by history and are stated as doctrine is significant. The next step of developing a quantitative relationship remains.

Limitations

Prior to presenting the quantitative relationships that serve as a guide for task organizers in planning a force for urban combat, it is essential to develop some of the limitations in this research.

The major limitation stems from the availability of data. While the library of the US Army Command and General Staff College is an extensive military library, the number of reference works describing task organization is limited. The bibliography of this thesis includes all those references that were screened to produce the eighteen combat engagements used in chapter 3. All of the conclusions are based on the task organizations found in the available references. Conceivably, other references would add data points that could change the conclusions of this research.

A key relationship used in this study was that of population to portray the degree of urbanization. This is not always true. Cities grow in many patterns. Some grow in step functions, i.e., have a surge and then wait awhile. During this interval the construction density or methods might have changed. The location of the city and the nature of its industry also has an impact on urbanization and population density. Considerably more extensive research would have been required, coupled with a larger data or reference source, to have been able to relate the combat engagements to any other index than the simple population.

The degree to which the town was prepared for defense could have a function in the unit relationships. This again was usually unavailable in quantifiable terms due to the references available.

A central theme in this limitations section is the apparent lack of reference works. Many types of sources were consulted. These

included original unit histories, unit daily journals on microfilm and diaries made by unit commanders. The paucity of data on specific task organization pervades all these sources. It could therefore be concluded that there are very limited sources of task organization data and the sample found at the Command and General Staff College Library is probably representative of the amount of task organization data available from any source. The data was probably never recorded in any but a few units that happened to have been extensively researched by historical teams.

Thus, while there are apparent limitations in the research, it would appear to be a methodology that would work should other data become available.

Decision Reference Criteria

Figures 7 through 12 were used to determine an average value for the ratio for each urban classification. An average value, or u, was determined by entering the midpoint value of the urban classification and noting where that point intersected the line. Then looking to the left, an average ratio was noted and recorded in table 7.

Table 7 can then be used for approximate calculations in determining unit ratios during task organization. This method is used to determine rough values. An exact value can always be determined by referencing the exact urban population and entering the graph and determining an exact ratio rather than an average ratio in the preceeding example.

Table 7 lists the relationship between engineers and maneuver units for an average sized city as u=0.125. This means that in an averaged sized city, 0.125 engineer units are needed for each one

	OPEN TERRAIN (DOCTRINAL)	SMALL CITY	AVERAGE CITY	LARGE CITY
TANK:INFANTRY UNITS	2:1	u = 0.75 1:1.33	u = 0.40 2:5	u = 0.125 1:8
ENGINEER:MANEUVER UNITS	1 Squad/ maneuver company or 0.11	u = 0.11 1 squad/ co.	u = 0.125 1:8	u = 0.166 1:6
ARTILLERY:MANEUVER UNITS	1 DS Bn/ Bde 1:3 or 0.33	u = 0.54 1:2	u = 0.575 1:1.75	u = 0.65 1:1.5

Table 7. Decision Reference Criteria

EXAMPLE: Determine the task organization to support 5 infantry battalions in a large city.

Tank Units = 0.125 X 5 = 0.625
Engr Units = 0.166 X (5 +0.625)=0.93
Arty Units = 0.65 X (5+0.625)=3.65

So the solution would be to provide 2 tank companies, 1 engineer battalion and four artillery battalions (rounding as required by the situation).

maneuver unit. Working the 0.125 back into whole numbers, it is determined that one engineer unit must support 8 maneuver units in an averaged sized city.

Another example to illustrate the use of table 7 would be determining the number of tank units needed to support five infantry units in attacking an average sized town. The initial formula is:

u = tank units:infantry units

Table 7 shows u =0.40 for the tank:infantry ratio in an eraged sized city. Substituting the known values in the foregoing relationship:

0.40 = tank units : 5 infantry units

Solving this relationship:

tank units =(0.40) X (5 infantry units)

so tank units = 2

Similar calculations can be made for the number of engineers and artillery units required.

This method provides a quick, and historically reliable method of determining the proper support requirements for armor, engineers and artillery.

Summary

The hypothesis of this thesis was that historical examples could be used to develop decision reference criteria to aid the planner in task organizing a unit for urban combat.

The historical urban combat engagements were presented, tabulated and analyzed. The previously unquantified relationships have been quantified and presented to the planner. By using the values provided in table 7 or by using the original figures 7 through 12, the task organizer can quickly and reliably task organize his unit for combat.

The numbers and support relationships developed in this study should be tested in MOBA scenarios, computer simulations and other war games to verify their validity.

The addition of other data points provided by other new research materials in addition to the war gaming should establish a larger data source fr· which to draw other conclusions. It is essential that the support relationships be quantified so that planners and force structuring officers can make more educated calculations in determining the types of forces the combat leader must have available should he be forced into urban combat in the future.

APPENDIX A

NOTES

CHAPTER 1

1. Bruce M. Russett-Hanson, "Political Perspectives of US Military-Business Elites," Armed Forces and Society, Vol I (San Fransisco: W. H. Freeman & Co., 1975), pp. 79-108.

   Raoul H. Alcala, "Education and Officer Attitudes," The System For Educating Military Officers in the United States (Pittsburgh: International Studies Association, 1976).

   Both of these complimentary studies concluded that the survey of military officers found 64.4 % felt that a counterinsurgency action was the most likely; 23 % felt a major nonnuclear war most likely; 4.9 % felt a major war with nuclear weapons most likely; 7 % felt a civil disturbance engagement most likely; and 0.7 % felt a major nuclear exchange most likely if war were to occur in the next decade.

2. Department of the Army, FM 100-5, Operations (Washington, DC: Department of the Army, 1 July 1976), pp. 1-2.

   The "How to Fight" series includes forty-one manuals that are the main tactical doctrine of the US Army. These books are characterized by a loose leaf camouflage cover. A complete listing of the manuals is found in Appendix B to FM 100-5, the capstone manual.

3. Readers Digest, 1977 Almanac and Yearbook (Pleasantville, NY: Readers Digest, Inc., 1977), p. 481.

4. Ibid., p. 873.

5. Paul Bracken, "Urban Sprawl and NATO Defense," Military Review, October, 1977, p. 34.

6. Department of the Army, FM 5-100 (Final Approved Draft), Engineer Combat Operations, August 1977, p. E-3.

7. Hans A. Kratz, "Combat in Built-Up Areas," Infantry, May-June 1975, p. 31.

8. John F. Meehan, III, MAJ., "Urban Combat: The Soviet View," Military Review, September 1974, p. 46.

9. C. W. Donnelly, "Soviet Techniques for Combat in Built-Up Areas," Military Review, November 1977, p. 37.

10. B. Bruce-Briggs, "Suburban Warfare," Military Review, June 1974, p. 10.

11. Lilita I. Dzirkals, et al., Military Operations in Built-Up Areas: Essays on Some Past, Present and Future Aspects (Santa Monica, CA: Rand Corporation, June 1976), p. 53.

12. FM 100-5, op. cit., p. 3-3.

    The prerequisites of winning a battle are used nearly verbatim to preclude any interpretative loss. Although this section is not in quotation marks, it perhaps should be because of the similarity of prose to FM 100-5.

13. Ibid., p. 3-9.

14. Ibid., p. 3-4.

15. Ibid., p. 14-2.

16. Department of the Army, FM 17-95, Cavalry (Washington, DC: Department of the Army, 1 July 1977), p. E-2.

17. FM 5-100, op. cit., p. E-12.

18. Department of the Army, FM 71-100, Brigade and Division Operations (Final Approved Draft)(Washington, DC: Department of the Army, May 1977), p. 7-6.

CHAPTER 2

1. A.E. Hemesley, MAJ., "MOBA-Too Difficult?," Journal of RUSI, March 1977, p. 24.

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