# Light Armor MOUT Doctrine: Imperative Change or Business as Usual?

A Monograph
by

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Abstract

LIGHT ARMOR MOUT DOCTRINE: IMPERATIVE CHANGE OR BUSINESS AS USUAL? by MAJ Alan M. Mosher, USA, 59 pages.

This monograph discusses whether current U.S. Army doctrine for the use of light armor is sufficient to support light infantry forces in military operations on urbanized terrain (MOUT) at the brigade level. The U.S. Army will soon replace the M-551A1 Sheridan with the M-8 light tank. The most likely employment of light armor will be with light infantry divisions in contingency operations. The best use of a light division is in restrictive or urbanized terrain. The current urban doctrinal paradigm for armor is that tanks will avoid built up areas. The result of this mind set over many years is that typically armor and light infantry do not train together for MOUT. As a combined arms force, armored and light infantry forces are unprepared for war in urban areas. This monograph evaluates the relevancy of current and emerging U.S. Army light armor MOUT doctrine. It also examines historical lessons learned from armor operations with light infantry in MOUT. It focuses on three areas: (1) the need for light armor to fight in urban areas, (2) the need for combined arms orientation in MOUT, and (3) the need for a common doctrine on how to fight in MOUT.

This monograph first examines the relevancy of current and emerging light armor MOUT doctrine. Next, the study examines three historical examples of armor / light armor and light infantry in MOUT. The three battles are Hue (1968), Suez (1973), and Panama (1989). Analysis reveals that light armor can not avoid urban areas. Light infantry units need the heavy direct fire support provided by light armor to fight in built up areas. The lack of doctrinal emphasis on MOUT has led to separate branch training and little combined training at all in built up areas. Armor units in particular do not often train MOUT. There is little in doctrine that tells light armor and light infantry forces how to fight together.

This monograph reaches four conclusions. First, light armor will have to fight in built up areas with light infantry. Second, there must be a doctrinal change to emphasize the importance of MOUT combined arms training. Third, there must be one MOUT doctrine for light armor and light infantry fighting together. Light armor and light infantry MOUT doctrine should be in the future FM 90-10 or in a combined manual. Lastly, future MOUT doctrine must focus on how light armor and light infantry fight together.

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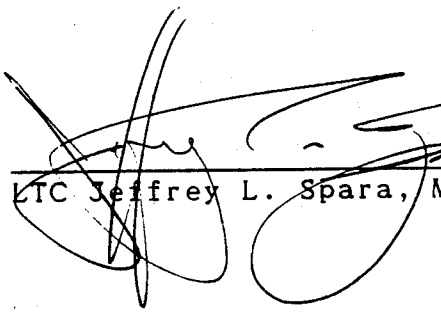

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## Section 1 - Introduction

Military operations on urbanized terrain (MOUT) are of vital importance to the U.S. Army today. Recent U.S. Army urban operations in Somalia emphasized the need for well trained forces in MOUT. New light armored vehicles, the creation of additional light armor battalions, and the increased likelihood of combat in urban areas are factors which will force the U.S. Army to re-examine light armor MOUT doctrine. The first units to deploy during future contingency operations in urban areas will probably include light infantry and light armored forces.

The U.S. Army recognized the need for a new light tank to support air deployable light forces since the late 1970's.(1) The Light Infantry Division's anti-tank weapons are at best marginally effective against Soviet style equipped armor forces.(2) These divisions also lack any significant heavy direct fire weapons capability. There is currently one light armor battalion consisting of M-551A1 Sheridans assigned to the 82nd Airborne Division.

The aging Sheridan first saw action during the Vietnam War. These vehicles are difficult to maintain, the armor is too light to defeat modern anti-tank weapons, and the Sheridan's 152mm missile system has insufficient range and a long time of flight.(3) The Sheridan's future replacement will be the M-8 Light

Tank.(4)

The Army plans to field two additional M-8 equipped battalion size organizations with light divisions or in a corps organization. Light armor will also be part of the light armored cavalry regiment.(5) The most likely employment and the primary purpose of light armor will be to deploy with light infantry divisions in contingency operations.(6) The best use of light infantry divisions is in restrictive terrain.

Restrictive terrain includes built up areas, thickly wooded areas, or mountainous terrain.(7) Of these three types of terrain, built up areas or MOUT will be the most prevalent.

Warfare in urban areas will increase on an unprecedented scale during the remainder of the 1990's and into the 21st century. By the year 2000, urbanization will increase by 75% to 100% above the current level of urbanization in Europe.(8) Recent unrest in Eastern Europe and the civil war in Yugoslavia has largely centered around or in large urban areas.

Third world countries populations are gravitating towards cities. These countries often have insurgencies that develop within their urban areas.(9) MOUT also suits light infantry based third world countries because urban terrain favors a lightly armed smaller defender in his own territory.(10)

U.S. forces have fought in numerous conflicts involving urban terrain to include the Dominican Republic (1965), Hue (1968), Grenada (1983), Panama (1989), and Somalia (1993).(11) Whether U.S. forces are sent into combat operations, military assistance, or peacekeeping they will most likely operate in an urban environment. According to John J. Mahan, a senior NATO analyst, sixty percent of future combat will be in urban areas.(12) Light infantry will need light armor to enhance anti-armor capability and to provide direct fire support in MOUT.

There are significant third world country forces that can oppose a light infantry and light armor force in an urban environment. There are more than twenty eight countries with more than 1,000 main battle tanks.(13) Numerous developing nations can field multi-battalion size armored, mechanized, and light infantry forces.(14) A requirement exists for light armor in MOUT. This monograph looks at the question: **Is the current U.S. Army doctrine for the use of light armor sufficient to support light infantry forces in MOUT at the brigade level?**

The current paradigm for armor is for tanks to avoid built up areas. Some combat arms leaders in the U.S. Army think that tanks do not fight in urban areas.(15) The result of this mind set over many years is that armor and light infantry do not train together

for MOUT. LTC William Betson, commander of 6-40 Armor, Berlin Brigade, U.S. Army, stated that, "virtually no tank units practice techniques of city fighting. We simply declare our desire to avoid built up areas, and thereby wish the problem away."(16) Due to a lack of training as a combined arms force, armored and light infantry forces could be unprepared for war in urban areas.

In the future light armor will clearly have to fight with light infantry in urban terrain. This study reveals a lack of light armor MOUT doctrine by evaluating current and emerging U.S. Army light armor MOUT doctrine. The study also supports the need for this doctrine by examining selected historical examples of armor and light infantry MOUT. The areas examined are: (1) the need for light armor to fight in urban areas, (2) the need for combined arms orientation in MOUT, and (3) the need for a common doctrine on how to fight in MOUT.

This study is arranged in four sections. Section 2 reviews current and emerging MOUT doctrine. Section 3 examines the lessons learned from three historical examples of armor with light infantry in MOUT. These examples are the battles of Hue in (1968) during the Vietnam War, Suez City (1973) during the October War, and Panama City (1989) during Operation Just Cause. Section 4 is an analysis and synthesis of doctrine and

lessons learned in the use of light armor in MOUT. The final section presents findings and conclusions.

It is necessary to define the key terms used in this study. FM 100-5, Operations states that doctrine consists of the, "fundamental principles by which military forces guide their actions in support of national objectives. Doctrine is authoritative but requires judgment in application."(17) At the tactical level doctrine expresses how the Army will fight in MOUT. FM 90-10, Military Operations On Urbanized Terrain (MOUT) defines MOUT as,

> all military actions that are planned and conducted on a terrain complex where manmade construction impacts on the tactical options available to the commander.(18)

In this study the definition of light armor refers to wheeled or tracked armored vehicles that weigh less than 30 tons and have armament systems designed for direct fire support (See Appendix A). FM 71-100-2, Infantry Division Operations defines Light infantry forces as light, air assault, and airborne infantry divisions (See Appendix B).

The M-8 light tank defines the U.S. concepts of light armor in the future. The U.S. Army will field the first M-8 battalion with the 82nd Airborne Division in late 1997. The M-8 will be air deployable in the C-130, C-141, C-17, and the C-5A. The vehicle has

three armor package levels of protection which range from 17.8 tons to 24.8 tons for ballistic protection up to 30mm size projectiles. The M-8 relies on speed and agility to fight tanks. The main armament is a 105mm M68A gun with an inverted breech and a soft recoil mount. The M68A gun has a 21 round auto loader with 9 additional stowed rounds on board. Secondary armament is a coaxial mounted 7.62mm machine gun. The M-8 has grenade launched smoke capability and a Nuclear - Biological - Chemical overpressurized system.(19) The light armor battalion will have 58 M-8s but will not have a mortar or scout platoon.(20)

## Section 2 - Current and Emerging Doctrine

Current U.S. Army MOUT doctrine emanates from several sources starting with FM 100-5, Operations and ending with the Army's primary manual on MOUT FM 90-10, Military Operations on Urbanized Terrain (MOUT). Doctrine only addresses light armor MOUT in FM 17-18, Light Armor Operations. In the search for doctrinal guidance above the battalion level, light armor leaders must look to heavy force doctrine. This section examines current and emerging doctrine in the areas of: (1) the need for light armor to fight in urban areas, (2) the need for combined arms orientation in MOUT, and (3) the need for a common doctrine on how to fight in MOUT.

FM 100-5 is the keystone manual for all Army

doctrine. It states that urban operations are unique. Built up areas tend to eliminate technological advantages and decrease the tempo of battle. Forces fight in small disciplined decentralized units. U.S. commanders must also minimize civilian casualties and colateral damage.(21) While FM 100-5 refers the reader to FM 90-10 for more information on fighting in urban areas, other parts of FM 100-5 allude to fighting in built up areas.

In the defense FM 100-5 states that the defender chooses terrain that gives him the greatest advantage.(22) Increased urbanization offers all countries the ability to defend in urban areas. FM 100-5 states that in the attack, commanders should avoid urban areas which will hinder a rapid advance. Light forces can use urban areas to free heavy forces for maneuver.(23) The implication is that armored forces will avoid built up areas while light forces will conduct MOUT. FM 100-5 does not specifically mention light armor in MOUT, but it does discuss light armor operations in general.

Light armor can participate in a variety of operations. The tactical missions stated include security, reconnaissance, anti-armor firepower for light infantry, and standard armor missions with other arms.(24) The central problem is that standard armor missions avoid built up areas. Light armor in support

of light infantry will not have that luxury. The corps and division doctrinal manuals briefly discuss MOUT.

Both FM 100-15, Corps Operations and FM 71-100, Division Operations state that light infantry will fight in urban areas. The corps manual discusses the fact that corps can best use light infantry in restrictive terrain and urban areas. Light forces can fight heavy forces in built up areas, but they will need augmentation.(25) FM 100-15 mentions anti-armor weapons, but does not specifically cite heavy or light armor. The divisional manual expresses the same ideas as the corps manual. Additionally, FM 71-100 explains that light forces will conduct MOUT with a heavy force, but does not state why, when, or how that will occur.(26) FM 71-100-2, Infantry Division Operations Tactics, Techniques, and Procedures (TTP) is the first manual that starts to discuss MOUT in more detail.

The U.S. Army designed FM 71-100-2 (TTP) for division level commanders, division staffs, and major subordinate units (brigades).(27) This manual sends some important signals to leaders of subordinate units. FM 71-100-2 (TTP) does not mention the use of light armor in MOUT or other operations and defers the reader to FM 17-18.(28) FM 71-100-2 (TTP) stresses avoidance of built up areas, but advocates the use of combined arms when MOUT is necessary.(29) The manual does state what to do with armored forces in a city such as plan a

counterattack, but it does not state how armored forces will execute a counterattack. The manual focuses more on what to do and not how to do it. FC 71-101, Light Infantry Division Operations does not provide any more guidance than the Infantry Division (TTP).

The Light Infantry Division Operations manual is very general in nature. FC 71-101 does not mention light armor and light infantry forces operating together in MOUT. The manual also defers to FM 90-10. FC 71-101 recommends combined arms operations in urban terrain, but again there is little on what to do with armor in built up areas and nothing on how to accomplish tasks with armor in MOUT.(30)

The primary doctrinal manual for MOUT in the Army is FM 90-10 (MOUT). This manual's last revision was in 1979. The entire focus for FM 90-10 is on combat in the European theater of operations and is strongly rooted in the World War II experience. FM 90-10 is a "Stalingrad" infantry based doctrine with no useful civilian considerations, no rules of engagement (ROE), and no restrictions on firepower.(31) Of note is that "The small city of Stalingrad consumed more infantry divisions than we currently have in the U.S. Army."(32) If we tried to apply this doctrine, we would need infantry rich formations. Although the manual states that the urban fight must be a combined arms effort, there is little written on how armor and light infantry

will fight together.

There are only two pages on armored forces in built up areas in FM 90-10. The doctrine stresses that armor must avoid built up areas and that they are so trained. FM 90-10 covers armor's role in fighting in small villages, but does not address large urban areas. There is no general concept of light armor and light infantry operating together. More importantly, there is no specific guidance on how armor and infantry would fight together in MOUT.(33) FM 90-10-1, An Infantryman's Guide to Combat in Built Up Areas is one of the first manuals to attempt a shift in MOUT thinking.

The infantryman's guide on MOUT states that U.S. forces can not avoid combat in urban areas. "MOUT is expected to be the future battlefield in Europe and Asia with brigade and higher level commanders focusing on these operations."(34) FM 90-10-1 tells infantrymen how to fight in built up areas and stresses combined arms operations. The doctrine also establishes what tanks can accomplish in MOUT, especially in terms of direct fire support.(35) However, the manual does not discuss how armor and infantry fight together nor how light infantry conducts MOUT with light armor. FM 17-18, Light Armor Operations is the only doctrinal manual that addresses light armor in MOUT.

The U.S. Army Armor school wrote FM 17-18

specifically to assist light armor battalion leaders in operations with light infantry.(36) Light armor's mission includes providing anti-armor and direct fire support to light infantry in built up areas and other restrictive terrain.(37) As a whole the doctrine is combined arms oriented.

The primary focus of FM 17-18 is on the small unit leader. The doctrine contains much information on how to accomplish many TTP's. At the platoon level, the manual instructs M-8 crews how to fight from individual vehicles through platoon operations. However, there is not much guidance on how light armor accomplishes MOUT tasks with light infantry. An example is the attack phases against a built up area. These phases are: (1) isolation of the built up area, (2) gaining a foothold at the edge of the built up area, and (3) systematic clearance and seizure of objectives.(38) FM 17-18 is excellent in telling an armor leader what must be done, but the manual does not tell him how to accomplish tasks in conjunction with light infantry. The manual also provides only a brief discussion on MOUT at the company level and none at the battalion level.

Most urban fighting will probably take place at the platoon level and below. There are, however; two issues at the company and battalion level. Light armor company MOUT doctrine advocates rushing built up areas in a poorly defended area or during a surprise

exploitation.(39) The company would conduct the attack with little or no infantry. There are no MOUT responsibilities for the light armor battalion such as a possible command and control headquarters in an urban area in FM 17-18.

This section examined current and emerging doctrine. Using the same three doctrinal areas of examination, this study will now examine three urban battles to determine if the areas of doctrinal concern hold true in a historical context.

## Section 3 - Historical Use of Armor with Light Infantry in MOUT

This section examines three examples of armor fighting in built up areas. These examples are instructive for several reasons. All the battles included light infantry fighting with armored forces. Each battle contained light or medium armored forces fighting in MOUT. Two of the battles involved U.S. forces. All the examples occured within the the last twenty five years and provide insight into the development and execution of combined armor and light infantry MOUT doctrine.

### The Battle for Hue, 1968

The battle for the city of Hue began on January 31, 1968. The city was one of many political and cultural centers attacked during the North Vietnamese Army (NVA) and Viet Cong (VC) Tet Offensive. The battle included

U.S. Marine Corps and the Army of the Republic of Vietnam (ARVN) light infantry, light armor, and medium armor. For the Marines, Hue was the first urban battle they had fought since the liberation of Seoul, Korea in September of 1950.(40)

The Marine infantry and armored forces in Hue were not well trained for MOUT. Some of the more senior Marines had received training as recruits, but none after their basic training. The Marine Corps had cut combat city training from its infantry program prior to Vietnam.(41)

LTC Ernie Cheatham's 2nd Battalion, 5th Marine level of training was typical for most officers. LTC Cheatham had not received training in MOUT since he was a lieutenant prior to the Korean War. The day before departing for Hue, he found a "slim haul" of MOUT manuals in the bottom of a foot locker in the 5th Marine command post.(42) The basic information he gleaned was that the best way to fight in MOUT was to gas the enemy, blow things up, and clear out the ruins. Hue would prove to be a severe introduction to MOUT for U.S. forces.

Hue was the old capital of imperial Vietnam and a vital economic center of the French colonial period. At the time of the battle it was the capital of Thua Thien Province and the cultural center of Vietnam. The city center was dominated by the Imperial Citadel which

was a copy of the Imperial City in Peking, China. The Citadel covered eight kilometers, and was surrounded by a moat and an earth and stone wall twenty feet thick and thirty feet high. The buildings inside were of heavy stone construction. The Perfume River ran south of the old city (Appendix C). The population of Hue was approximately 140,000 people.(43) Hue was important militarily because it was a logistical hub. A railroad, a Navy supply point, and Highway 1 intersected in Hue. U.S. and ARVN forces moved supplies from Da Nang to the Demilitarized Zone via Hue.

NVA and VC forces infiltrated the city on 29 and 30 January 1968. Except for the attack on Saigon, Hue involved more communist troops than any other city during Tet. There were 314 immediate objectives planned for the first day's attack in Hue. The initial attack involved over 5,000 NVA and VC soldiers.(44)

On 31 January, communist forces attacked and quickly over ran the city. The only friendly held positions were the 1st ARVN Division Headquarters in the Citadel and the U.S. Military Assistance Command, Vietnam (MACV) compound. These small U.S. and ARVN forces held out at their respective locations until relief forces arrived later that day. Two U.S. Marine companies with five tanks, three ARVN infantry battalions, and a ARVN armored cavalry squadron (ACS)

fought their way into Hue on 31 January and 1 February. Reinforcements eventually totaled eleven ARVN and three U.S. Marine battalions.(45)

By 13 February ARVN forces had retaken the airfield. The Marines cleared the south bank of the Perfume River and then linked up with ARVN forces fighting in the Citadel. Extremely heavy fighting took place in the Citadel. Initially U.S. forces were under strict rules of engagement (ROE) due to the presence of civilians and the cultural significance of Hue. This prevented the use of tactical air support and artillery fire in the city. Because of the intense fighting, higher headquarters lifted this restriction on the 13th. The NVA and VC units did not place any restrictions on themselves throughout the battle.(46)

On 16 February the senior NVA commander requested to withdraw out of Hue. Although his higher headquarters denied his request, he proceeded to leave the city three days later. ARVN and Marine troops eliminated the last communist units in the Citadel on 24 February. On 25 February friendly forces defeated the last NVA and VC remnants and ended the battle for Hue.(47)

The battle lasted for twenty five days. During that time the fighting reduced the city to ruins. Casualties were 1525 ARVN and Marine and 5000 communist.(48) There were hundreds of civilian

casualties due to the fighting and 2,000 documented cases of executed civilians by the communist forces.(49) The use of armor in Hue was instrumental in the initial defense, relief, and recapture of the city.

Three types of armored fighting vehicles fought in Hue. The Marines used the M-48A1 Patton tank and the M-50 Ontos. ARVN forces used the M-41 Walker light tank. The M-48 mounted a 90mm main gun. The M-50 Ontos was a light armored gun system (AGS) which mounted six 106mm recoilless rifles.(50) The M-41 Walker light tank had a 76mm main gun.

Although the use of armor in urban fighting in Hue proved decisive, the lack of MOUT and combined arms doctrine and training proved to be painful. The friendly forces that broke into Hue and defended the ARVN and MACV compounds were not combined arms oriented.

The initial relief operations into Hue were a disaster. An ARVN paratrooper battalion attacked without armor support towards the 1st ARVN Division compound and was beaten back. The ACS then attacked without infantry support and NVA forces pushed them back three times. On the fifth try the paratroopers and the armor attacked together. They penetrated to the 1st ARVN Division compound and mounted a successful defense against repeated NVA attacks.(51)

The U.S. Marines made similar mistakes. While the initial Marine infantry attack was beaten back, five M-48's and two ARVN M-41's with light infantry support fought through the south side of the city and secured the MACV compound.(52) In the heavy city fighting that followed, the Marines often sent armor forward without infantry security. This usually resulted in rocket propelled grenade (RPG) attacks against the tanks. Light infantry attacks against strong points proved costly without armor support. The heavy friendly casualties were due to poor MOUT training and lack of combined arms action. Eventually combined arms operations in Hue became routine and highly successful.

In the early fighting tanks took multiple RPG hits. Each tank that supported 1st Battalion, 5th Marines had taken ten to twelve hits apiece.(53) Tanks could not continue to sustain this type of damage. This was especially true of the Ontos and the M-41's because of their light armor. So these units developed their own combined arms techniques.

Generally vehicle commanders would identify targets by dismounting from the vehicle or by receiving commands on the radio. The infantry would provide security and covering fire as the tank moved forward. The armored vehicle would engage the target and rapidly move back to defilade under infantry security. No Ontos were lost in 1/5 Marines using these tactics.(54)

There were many tactical variations involving tank sections and mixing different combinations of M-48's, M-41's, and Ontos. Armor was the most effective in eliminating strong points.

MAJ Bob Thompson, the 1/5 Marine commander, considered the tanks and Ontos his most important assets.(55) The light infantry could only take strong points with heavy direct fire support. Armor proved to be the only weapon available to the light infantry in Hue that could break the deadlock at the communist held strongpoints.(56)

Marines in Hue also used armor to address other problems encountered in urban fighting. Tanks helped the light infantry with other missions that traditionally were difficult for light forces. Armored forces physically made routes through the city. They secured routes for casualty evacuation and movement of supplies. Because of the restriction on indirect fire and air support, tanks were the only quick, long range, high volume source for smoke. Tank fired smoke marked positions, covered movement between buildings, and was used to cover engineer demolition activities. A report from 3rd Platoon, A Company, 1st Marine Tank Battalion indicates how much tank support light infantry needed in Hue. The 3rd Platoon fired their entire basic load every day from 12 to 23 February in support of the infantry.(57) There were many lessons that came out of

the urban fighting in Hue for light infantry and armor urban operations.

A combined light infantry and armored force has to have adequate doctrine and training. The Marines went into Hue without an adequate MOUT doctrine and no emphasis on MOUT training. As a result, the Marines sent into Hue were unprepared. Additionally, armor support of light infantry in urban operations was essential because of the need for direct fire support. There must be a combined arms approach to doctrine and fighting for light infantry and armor in MOUT. In Hue, light infantry and armor fighting together proved more effective than either arm by itself. Like the U.S. Marine and ARVN armor, the Israeli Army would learn the folly of one combat arm fighting in an urban area during the Battle for Suez City.

## The Battle for Suez City, 1973

The Israeli attack on Suez City took place from 23 to 28 October during the last days of the 1973 October War. The taking of Suez was a last attempt by Israel to expand territorial gains before United Nations (U.N.) observers arrived to enforce the cease fire agreement. It was also part of the ongoing operation to complete the encirclement of the Egyptian Third Army. Although the Israeli Defense Forces (IDF) consisted of armor and light infantry units, the Battle of Suez was won by the Egyptian Army. The IDF could

trace its defeat in Suez City back to IDF MOUT doctrine.

The MOUT doctrine that the IDF took into the October War had its roots in the Six Day War of 1967. During the Six Day War most IDF attacks in the Golan and Sinai were mounted and on roads. The successful attack and seizure of Jerusalem was made with tanks leading, and infantry following far in the rear. The operations order even stated that if there was heavy artillery fire, the tanks would attack alone.(58) Thus was born the idea that armor pure attacks were viable in MOUT.

Success in Jerusalem and smaller urban areas during 1967 led to an armored dominated doctrine. In fact, between the 1967 and 1973 wars, there developed two diverging MOUT doctrines. Light and mechanized infantry adhered to the overall IDF doctrine that focused on infantry. The other doctrine developed by the dominant armor branch, relied heavily on the use of pure armor in built up areas. The two separately developed doctrines were incompatible and led to a neglect of combined arms training between the wars.(59) The center piece of the armor doctrine was the tank.

The armored MOUT doctrine called for a three phase attack by armored forces on a built up area. During the first phase, armored forces would bypass and cut all avenues of approach leading into the built up area.

The second phase included encirclement of the built up area, occupation of key terrain outside the built up area, and if possible seizure of key terrain or buildings inside the built up area. In the third phase, the IDF would capture the city using the "buzz". Their concept of buzz was the creation of shock by rapid armored thrusts.(60)

In the buzz, IDF commanders would alternate tanks, armored personnel carriers (APC's), and engineers within an armored column. Armored columns would move on parallel streets creating a high volume of fire. Tanks would fire on the lower levels of buildings and APC's on the upper levels. The columns were to spread out within the city, move to key objectives, and identify pockets of resistance. Infantry would follow and mop up isolated pockets of resistance. The purpose of the buzz was to defend the advancing column, create destruction, inflict heavy losses on the enemy, and eliminate the enemy will to resist.(61) This was the doctrine that the IDF took with them into Suez City.

There were a wide variety of building structures in Suez. Most of the buildings were two and three story homes of dried mud and stucco which were separated by narrow alleys. The larger government and business buildings were reinforced concrete and brick. There were large reinforced concrete apartment houses that were six to eight stories high. Most of the

buildings had flat roofs and porches which provided good RPG positions.

The streets varied greatly within the city. The main roads entered Suez through the city's three main gates. In the north west, Route 33 from Cairo runs through the first gate to the center of the city. Route 33 varied in width from 75 to 200 meters. From the north, the road from Ismailia runs through the north gate and intersects Route 33 in the center of the city. The road from Adabiah enters the city through the southern gate and channelizes movement into the industrial area (Appendix D).(62) Egypt put the physical characteristics of Suez to good use.

Egyptian forces started to plan for the defense of Suez before the war began. Egyptian authorities evacuated sixty percent of the population a year before the war and established a civil - military government. The Egyptian government allowed essential civilians to remain and then trained and organized them to help defend the city. Engineers preset demolitions, units preselected observation posts for scouts and artillery observers, and units predesignated and prestocked supply points.

After the war started, the Egyptian Army finalized preparations. Army units prepared engagement areas on the main roads into Suez. They finalized the artillery fire support plan and positioned two tank battalions to

overwatch crossing sites north east of Suez. Within the city they had two mechanized infantry battalions, an anti-tank company, and a few T-54/55 tanks.(63) The Egyptians had a well prepared defense when the Israelis attacked.

Seizing Suez City was important to the Israelis for many reasons. First, Suez City was tactically important because it was astride the Third Egyptian Army's line of communication. The city also contained large amounts of supplies for the Third Army. Second, Suez City was strategically important because the city location controlled the southern entrance to the Suez canal and contained a port. Third, Suez City was politically important because it would establish Israeli control in the eyes of the U.N. Additionally, control of Suez City would affirm the IDF's claim of having surrounded the Third Army.(64)

The IDF thought they could easily take Suez City. The Egyptian Army had been unable to mount any serious opposition to the IDF on the west bank. Thinking the Egyptians were in retreat, the IDF decided to quickly grab Suez. MG Avraham Adan was given orders to capture the city, "provided it did not become a Stalingrad situation."(65)

Adan had to quickly assemble his attacking forces and attack within six hours. The two armor brigades the IDF committed to take the city were the 217th and

460th. They did not have their own organic infantry. MG Adan gave them two company sized paratrooper battalions, an armored infantry battalion, a scout company, and a company sized reconnaissance battalion. Both brigades totaled 108 tanks and 102 half tracks and APC's. Three battalions of artillery provided fire support from the east bank.(66)

The IDF began the attack on the morning of 24 October 1973. Israeli forces encircled the city except for a small portion in the north where they encountered rough terrain and stiff resistance. Units from the 217th conducted a reconnaissance by fire into Suez before the attack. The was no response to the fire so the Israelis felt the defense was weak.

The 217th Brigade started the attack in the north. The mission of the 217th was to attack south along Route 33 and seize an objective centered on three key intersections in the city. The 460th Brigade attacked from the south of Suez to clear the industrial and port sectors. The 460th subsequently would link up with the 217th.

The 217th began the attack without the attached infantry. The 217th was held up for two hours by tank and anti-tank fire from the city perimeter. The brigade finally made progress once it linked up with the infantry. The brigade had great difficulty reorganizing with the infantry because the 217th was in

contact and the infantry had never trained with armor. One result of the initial confusion and lack of training was that the brigade did not organize into combined arms teams. The armored column that eventually formed was 2.5 kilometers long. The column was led by the armored battalion, then the two paratrooper battalions, and finally the scout company.(67)

The lead armor battalion advanced into the city at high speed. The rapid pace caused 500 meter gaps to form between each of the separate elements. As the lead battalion entered the second of the three major intersection objectives, the battalion's vehicles ran into the Egyptian engagement area. The Egyptians hit the first three vehicles and the last vehicles in the column with RPG's at the city gates. All the tank commanders of the lead battalion were killed or wounded. The remaining vehicles drove off the main road onto the side streets. Approximately one hour later most of the vehicles had been hit.(68) Command and control on the armor battalion's command net was nonexistent after the loss of the tank commanders, key communications personnel, and constant appeals for help on the command net. The battalion commander was finally able to regain control, move his surviving units to the final objective, and reorganize his force. During this first fight, the infantry were unable to

assist the armored battalion.

The paratroopers who were the second element in the column, dismounted when the lead battalion made contact. That decision was in accordance with their own doctrine. They were over 500 meters from the engagement area. The deputy brigade commander convinced the paratroopers to remount their vehicles. By the time they started to move, they were unable to close the gap between themselves and the armor battalion. They then proceeded to drive right into the engagement area and were forced to dismount. They secured buildings in the immediate vicinity and were cut off from the brigade.

The third and fourth elements in the brigade order of march were far behind the first paratrooper battalion. The second paratrooper battalion dismounted further back than the first. They abandoned their vehicles and continued forward on foot. They entered an Egyptian engagement area and were also forced to secure positions in nearby buildings. The last element, the scout company, took heavy casualties and withdrew out of the city.(69) The Israeli situation deteriorated fairly rapidly.

By 11:00 that morning the 460th was on its objective. The 217th was split into three elements, surrounded, and under intense fire. The rest of the day was spent trying to relieve the 217th.

There were several attempts to reach the beleaguered force. The 217th unsuccessfully committed an armored battalion that overwatched the north gate to the city. That battalion met heavy anti-tank fire and withdrew. The 217th tried to call in close air support, but the aircraft could not identify enemy targets. Eventually a tank heavy task force from the 460th linked up with the 217th armored battalion and extracted them from the city. The two paratrooper battalions withdrew undetected during the night. The last unit reached IDF lines at approximately 5:00 in the morning on 25 October.(70)

After the Battle of Suez City, the Israelis were in control of the ports, industrial areas, and the oil installations. The Egyptians, however, held the central part of the city. Estimates of Israeli casualties ranged from 100 to 400 soldiers. The IDF lost 28 armored vehicles destroyed on 24 October and 10 more in probing attacks on the following day. Egyptian losses are unknown but were thought to be minimal.(71) Both sides generally acknowledge that the Battle of Suez City was an Egyptian victory. There were several lessons that emerged from Suez for armor and light infantry MOUT operations.

The IDF definitely had a flawed doctrine. The separate branches must formulate and conduct MOUT doctrine and training together. Armor and infantry

could not fight independent of one another in cities. There was a need to know how to fight together. It was necessary for infantry to have direct fire support against strongpoints and armor to have infantry security. Armor did prove that it had two distinct roles in MOUT both in the attack and the defense. Armor could rapidly isolate and control the outside of a city and armor was necessary for direct fire support for infantry in the city. U.S. forces would rediscover the importance of armor direct fire support in the Battle for Panama City.

## The Battle for Panama City, 1989

U.S. urban operations took place in Panama City from 20 December 1989 to 3 January 1990 during Operation Just Cause, the invasion of Panama. The attacks in Panama City were a few of the 27 separate targets planned for Operation Just Cause. The urban battle fought by the U.S. contained light infantry, mechanized infantry, and light armor forces from the U.S. Army and the U.S. Marine Corps. Although MOUT doctrine did not reflect the actual combat operations in Panama City, U.S. forces successfully achieved their objectives.

The MOUT doctrine that U.S. forces used in Panama was essentially the same as that discussed in Section 2. The Army and the Marine Corps used FM 90-10 as their base MOUT manual. The doctrinal understanding

was European based with a concept of virtual unlimited use of force. The doctrine did not envision the extensive rules of engagement (ROE) that U.S. forces would have to contend with in Panama. As noted earlier, the lack of doctrinal emphasis and interest led to a lack of training. There was not a strong emphasis on MOUT combined arms training in the Army or Marine Corps.

Armored and light infantry forces did not train together. There were varying levels of MOUT training done by light infantry, but none was done with armored units.(72) Prior to the operation, 3-73 Armor was in a gunnery period and did not conduct MOUT training in the 82nd Airborne Division.(73) The Marines fared better because their light infantry always trained with their light armor support, the LAV-25. The MOUT training prior to deployment was important for all units because the majority of the objectives were in urban areas or bordered by built up areas.

The U.S. deployed forces to Panama to attain four objectives. The first objective was to ensure the safety of American citizens. The second objective was to protect the integrity of the Panama Canal. The third objective was to provide a stable environment for the freely elected Endara government. The last U.S. objective was to bring self proclaimed "maximum leader" Manuel Antonio Noriega to justice.(74) Panama City was

a key objective in the operation.

Panama City was important because the successful seizure of the objectives in the city would greatly help secure success in the overall operation. A large part of the Panamanian Defense Force (PDF), Noriega's headquarters, the Comandancia, and Noriega himself were in Panama City.

The city itself was a fairly dense built up area. Most of the buildings were multi-story concrete structures. There were several groups of apartment buildings that were ten to fifteen stories high. The city had good roads but they were narrow and dominated in the inner city by the high buildings. Many of the government buildings including the Comandancia were steel reinforced concrete.

Most of the heavy fighting in the city took place around the Comandancia. The Comandancia was a compound of fifteen buildings surrounded by a wall ten feet high. The compound covered a two block sized area that was six hundred yards south of SOUTHCOM headquarters. The PDF used the Comandancia as a central command and weapons storage center.(75) The Comandancia would be the focus of the light infantry and light armor assault (Appendix E).

The first light armor in Panama was a platoon of four M-551A1 Sheridans from C/3-73 Armor. The Sheridans teamed up with a platoon of Marine LAV-25's

to form Team Armor of 4-6 Infantry Mechanized. The remainder of C/3-73 Armor would air drop into Panama on 20 December.(76) Team Armor conducted extensive planning and reconnaissance prior to execution of the mission. There was an operational requirement to keep the Sheridan's presence a secret. As a result, Sheridan crews were not able to train with the infantry before the attack.(77)

On 20 December Team Armor moved to Ancon Hill into overwatch positions above the Comandancia. They were to provide direct fire support for the infantry assault. An engineer team was with Team Armor to clear fields of fire. Initially the team was unable to fire due to smoke obscuration.

At this point, the light armor started to be broken up into one and two vehicle sections. A Sheridan and a LAV-25 were positioned to fire on the southeast corner of the Comandancia. They destroyed the wall and established a blocking position. As the smoke cleared, the remaining vehicles in Team Armor engaged PDF soldiers in the Comandancia.(78) Elements of 4-6 Infantry continued to establish isolation positions around the compound.

Clearing of the Comandancia would be a combined arms effort. Team Armor would start with preparatory direct fires followed by Army Aviation fires. A reinforced Ranger company and C/1-508 Infantry

Airborne, would clear the buildings.(79) 4-6 Infantry would continue to surround the compound.

The Sheridans fired ten rounds of 152mm HEAT and the LAV-25's fired over 100 rounds of 25mm HE-T. The intent was to provide precision fires to minimize risk to friendly forces and civilians and minimize colateral damage. The infantry moved in to clear the compound and secured it by nightfall.(80) Team Armor would remain in the area of the Comandancia and Quarry Heights for four days in a counter sniper role.

After the seizure of the Comandancia, light armor fought in and around Panama City in a number of different types of missions. Sheridans were cross attached to several different units for direct fire support on isolated PDF strong holds. Team Armor supported 1-9 Infantry from the 7th Infantry Division (Light). Working with armor was a new experience for 1-9 Infantry. Combat in Panama city was their first experience with armor in MOUT.(81) The 3/73 Armor and 1-9 Infantry commanders worked closely together to ensure mutual support. They successfully cleared several buildings along Luis F. Clement Avenue.

U.S. units used Sheridans and LAV-25s to escort convoys, conduct noncombatant evacuation operations, overwatch passage of lines, support link up operations, and as a show of force. Light armor was important in a show of force role because it discouraged sniping,

looting, and general civil unrest.(82) Operation Just Cause ended on 3 January 1990 when Noriega surrendered to U.S. forces. Once the heavy fighting was over, light armor continued to play a role in post conflict activities. The lessons learned from combat operations in Panama City are cause for serious reflection.

The most important observation was that Panama City could have been a more difficult MOUT environment. The fighting in Panama City was not on the scale of Hue or Suez. The PDF was not nearly the determined opponent like those encountered at Hue and Suez. Except for a few isolated positions such as the Comandancia which exhibited determined resistance, the majority of the enemy offered token resistance.(83) The setting was fairly benign. The civilians were generally supportive. The PDF was poorly led, understrength, and without significant air, artillery, or armor assets.(84) In spite of this there were many significant lessons.

Light armor was extremely critical to light infantry in built up areas. This was especially true because of the ROE. Sheridans provided the only timely and precise heavy direct fire support. 105mm towed howitzers were too slow to move and emplace. The ROE, difficulty of avoiding ground fire, and problems identifying targets in a MOUT environment limited aviation support. Units used combined arms to a

limited extent.(85)

The success enjoyed by combined arms employment was mainly due to surprise, overwhelming firepower, discipline of U.S. soldiers, and the weakness of the enemy.(86) Most of the U.S. units clearly acknowledged their poor state of training in urban operations. The S-3 of 1-9 Infantry stated that he, "breathed a sigh of relief that the enemy had been even less prepared for combat than we had been."(87) Prior to deployment, doctrine and training had not focused on how light armor and light infantry should fight together.

Light armor and light infantry must mutually support each other in MOUT. To be proficient, units need intensive combined arms urban training that includes restrictive ROE and interaction with civilians. Light armor in conjunction with light infantry could perform many different missions beyond attack, defense, and support by fire. The last important issue that Panama City confirmed was that the U.S. needed a new rapidly deployable light armor vehicle. The Sheridan was obsolete. The push for the new M-8 would begin anew after Operation Just Cause was over.

## Section 4 - Analysis

### Analysis of Current and Emerging Doctrine

Current U.S. Army MOUT doctrine does not emphasize the need for light armor to fight in built up areas.

Army MOUT doctrine does not explicitly mention the use of light armor in urban areas except in FM 17-18, Light Armor Operations. The higher level manuals on Operations, Corps Operations, and Division Operations still advocate that armor should avoid built up areas. Although FM 100-5 covers light armor missions, MOUT is not included.

The Army's primary manual on MOUT FM 90-10, is outdated, does not cover light armor, and does not address the difference in employment of heavy and light armored forces. Even though light armor will most likely fight with light infantry in urban areas, there is no doctrinal emphasis on MOUT. MOUT should be one of the most highly trained missions for light armor and light infantry.

FM 17-18 covers MOUT in adequate detail at the platoon level and below. This is fitting because that is where most of the urban fighting will take place. Light Armor Operations however, does not place emphasis on the need to train MOUT at the company and battalion level. Without emphasis on higher level light armor doctrine in MOUT, units will gravitate away from MOUT training.

At the company and battalion level, FM 17-18 stresses missions other than MOUT. Those are exactly the missions those units will tend to spend more training time on. Higher level manuals will have to

stress light armor in MOUT for a change to occur. Based on the IDF experience, company level tank pure attacks are not effective. Although the decision is situational, a tank pure attack should be highly discouraged. There should also be more MOUT guidance at the battalion level. The IDF again demonstrated the need for command and control and urban perimeter operations at the armor battalion level. The need for a combined arms orientation is also important.

There is a lack of combined arms orientation in light armor MOUT doctrine. Overall our doctrine does emphasize combined arms effort. The problem surfaces with a lack of emphasis on MOUT in the higher level doctrine. There is no recognition of the need for light armor and light infantry combined arms effort. This is especially true in FM 90-10. Although stated as a desired condition, a lack of light armor / light infantry MOUT doctrinal emphasis could lead to little actual training. The result in actual combat could be a weak to non existent combined arms effort. Emerging doctrine on light armor in FM 17-18 does stress combined arms with light infantry in MOUT. Combined arms effort between light armor and light infantry is directly related to the doctrinal focus on how to fight.

There is no focus in U.S. Army doctrine on how to fight in MOUT. This is the biggest shortcoming for

Army MOUT doctrine. Although one would expect little on how to fight in higher level doctrine, historically several large operations involving whole corps and divisions took place in urban areas. These operations occurred in the last fifty years and include Stalingrad, Aachen, Berlin, Cologne, Manila, and Seoul.(88) The higher level manuals refer the reader to FM 90-10 for MOUT.

Again we find FM 90-10 lacking. The manual has no restrictions on firepower. There are no considerations for the current reality of restrictive ROE. The doctrine does a fair job of stating what a unit must do, but it does not state how to do it. There is no guidance on how light armor should fight with light infantry. Emerging doctrine starts to address the problem but falls short.

FM 90-10-1 sufficiently tells infantrymen how to fight in built up areas. FM 17-18 also adequately tells small unit armor leaders how to fight their units in MOUT. Neither manual covers how light armor and light infantry fight together. The need to address these doctrinal shortcomings is borne out by historical lessons learned.

Analysis of the Historical use of Armor With Light Infantry

There was a demonstrated need for armor to fight in built up areas. Armor was also clearly needed to fight with light infantry in urban areas. All three battles discussed in this study demonstrated the need for armor to provide direct fire support.

Heavy direct fire support helped to eliminate strong points. In Hue and Panama, tank direct fire broke stalemates between opposing infantry forces and helped reduce friendly casualties. In Suez, armored fire power enabled the IDF to extract themselves from the city. All three battles also illustrate the need for armor to isolate and break into a defended built up area. Hue and Panama highlighted the need for armor to conduct operations like convoy escort, link ups, and a show of force. Each battle at some point was fought under restrictive conditions.

Armor is the best weapon to support light infantry fighting under restrictive ROE. In Hue and Panama, ROE did not allow indiscriminate indirect and aerial fire support. This was necessary because of the presence of civilians and concern for colateral damage. In Suez the restrictions on the IDF were more situational. They did not have large amounts of indirect fire available. Additionally, their air force could not identify targets. In all cases armored forces provided

the best protection, firepower, and mobility for a heavy direct fire asset. There was a clear problem achieving combined arms effort in combat.

In each case the presence or lack of combined arms operations in MOUT dictated success or failure. Each battle experience was less successful initially because of weak doctrine and lack of emphasis on MOUT training. The failure of the IDF was one extreme due to two divergent doctrines and an over reliance on armor. The lack of combined arms resulted in the debacle at Suez.

Hue was the middle ground where armor and light infantry learned by trial and error that a lack of combined effort would lead to massive casualties. Panama City was a success and a reprieve at the same time. Although there was inadequate doctrine and MOUT training prior to the operation, there was just enough combined arms effort against a weak and an irresolute enemy in an urban environment for success. At the same time the operation demonstrated the need for combined arms effort between light infantry and light armor to reduce casualties in MOUT.

Each battle also demonstrated a lack of focus on how to fight in MOUT. The lack of focus on how to fight was clearly absent in the MOUT doctrine and the training that preceded each battle. Except for Hue, each force had a fairly clear understanding of what to do in their respective doctrines.

In Hue neither branch entered the battle with any how to fight MOUT skills. Before Hue and Suez, there was no attempt to focus armor / light armor and light infantry combined MOUT operations. In the case of Panama, light armor and light infantry did not have the benefit of the current TTP's. The infantry TTP's that did exist were branch specific and did not address the problem of how to fight with armor. There was no specific light armor MOUT doctrine prior to Just Cause. The aftermath of each of these battles called for a doctrinal and training emphasis on how to fight with combined arms in MOUT.

## Conclusions

The purpose of this study was to determine whether the current U.S. Army doctrine for the use of light armor is sufficient to support light infantry forces in MOUT at the brigade level. This study examined MOUT in terms of the current and emerging doctrine and historical lessons learned. The analysis focused on the areas of: (1) the need for light armor to fight in urban areas, (2) the need for combined arms orientation in MOUT, and (3) the need for a common doctrine on how to fight in MOUT. The analysis clearly demonstrated an imperative need for doctrinal change. There are four conclusions based on the overall analysis.

First, light armor will have to fight in built up areas with light infantry. The U.S. Army can no longer

base doctrine on avoidance of urban areas. The historical examples in this study demonstrate the need for light armor to support light infantry. Light armor is essential for heavy direct fire support. It is even more essential with restrictive ROE.

Second, although our doctrine overall does stress the use of combined arms, there must be a doctrinal change to emphasize the importance of combined arms training in MOUT. The historical evidence suggests that the stated doctrinal desire to avoid MOUT led units to avoid urban training. Training that did take place was not combined arms. In battle the units reaped the expected results. Little combined arms training results in high casualties and general failure.

Third, we must have one MOUT doctrine for light armor and light infantry working together. Presently, the sources for current and emerging light forces MOUT doctrine are predominantly in three manuals. These manuals are FM 90-10 MOUT, FM 90-10-1, The Infantryman's Guide to Combat in Built up Areas, and FM 17-18, Light Armor Operations. The latter two manuals focus primarily on their respective branches.

A divergence is possible similar to that experienced by the IDF. FM 17-18 states that a light tank company should conduct an attack armor pure into a built up area. That guidance alone reflects a possible

doctrinal divergence. Based on historical experience, any MOUT training taking place with the current doctrine will be essentially branch pure with few combined arms techniques. The solution must be a new FM 90-10 that includes TTP's for light armor and light infantry fighting together.

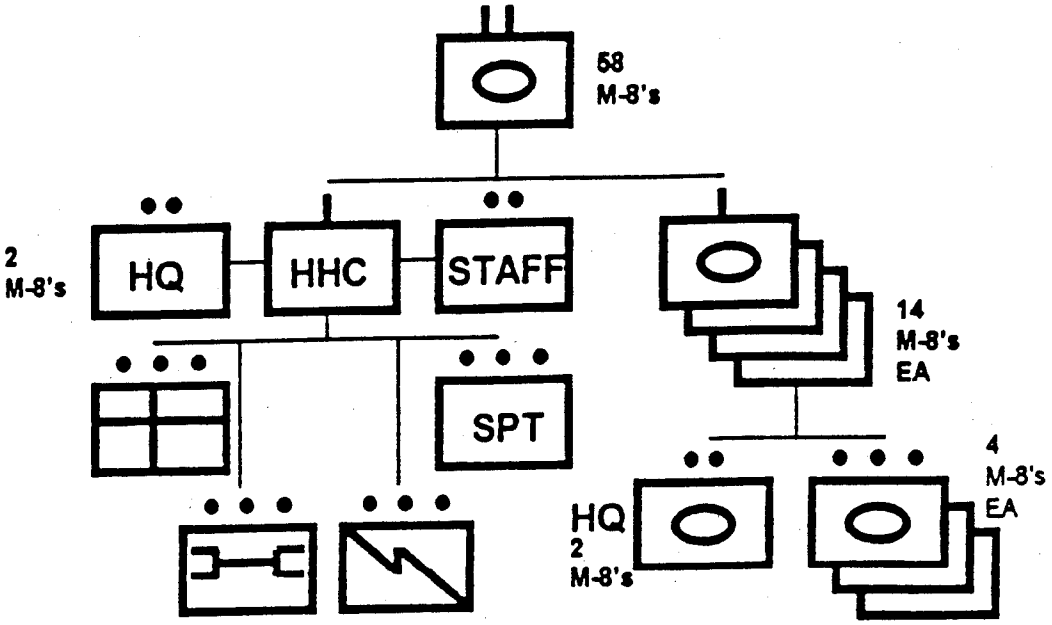
Fourth, future MOUT doctrine must focus on "the how to" for light armor and light infantry combined operations. Our present doctrine, "focuses too much on what to do and what not to do. There is no focus on how to do it."(89) Fighting in urban terrain is not just an adjustment in thinking on mission, enemy, terrain, troops, and time. "Urban terrain differs fundamentally from other terrain. It has characteristics all its own."(90) MOUT requires a whole different set of skills. These skills call for realistic and repetative training that focus on how light armor and light infantry fight together.

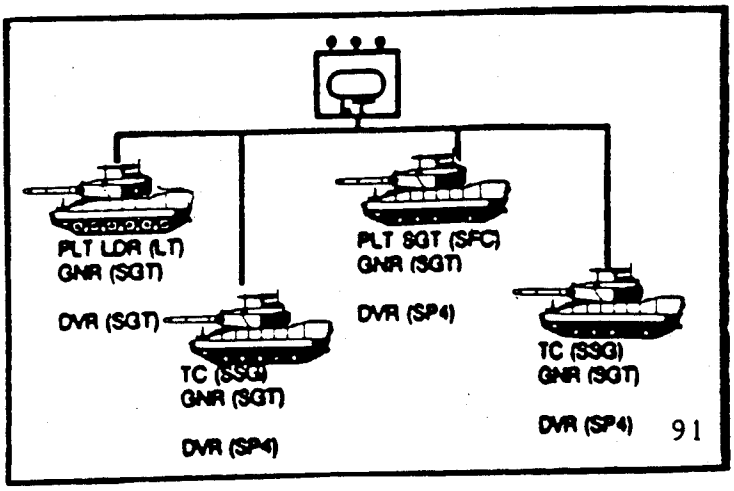
Light armor and light infantry forces will continue to find themselves in a contingency force role. The majority of future combat operations will take place in and around built up areas. Recent U.S. operations in Somalia, possible power projection operations into urban third world nations, and an offensive U.S. doctrine make MOUT an urgent issue for the U.S. Army. We can not afford to approach MOUT with a historical "business as usual attitude". The U.S. Army can not

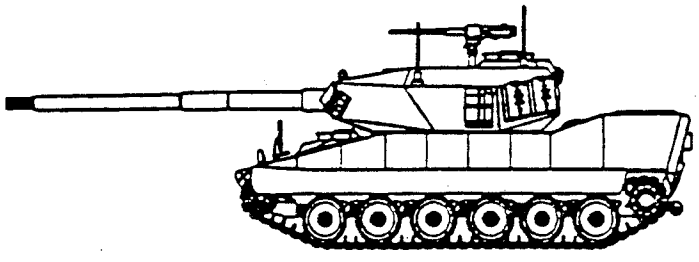
ignore light armor MOUT doctrine. Imperative change is necessary now in order to mold a winning light armor and light infantry combined arms team for future combat in MOUT.

APPENDIX - A

Light Armor Battalion Organization

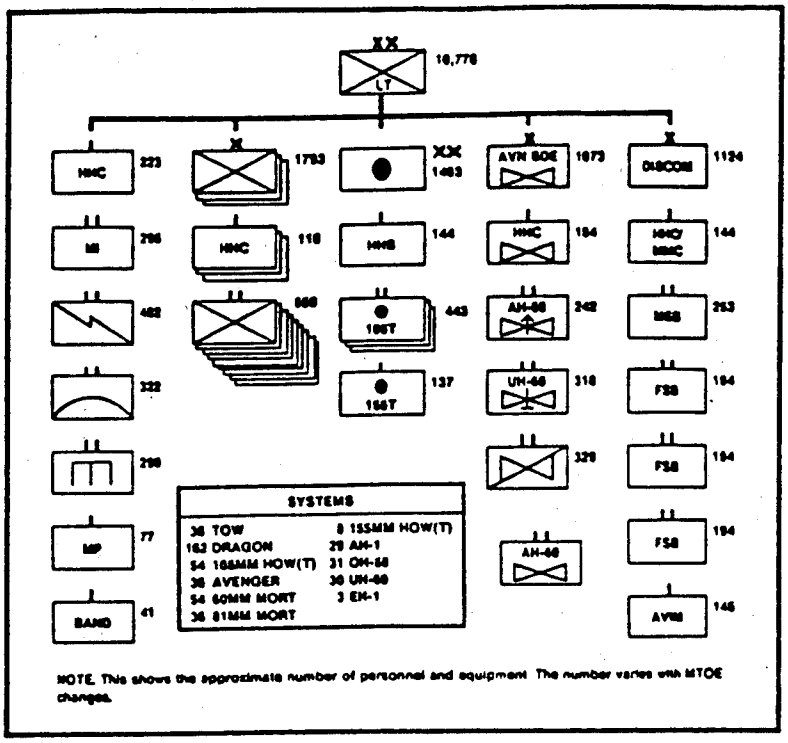


# APPENDIX - B

## Light Infantry Organizations




NOTE. This shows the approximate number of personnel and equipment. The number varies with MTOE changes.

*Figure 1. Light infantry division*

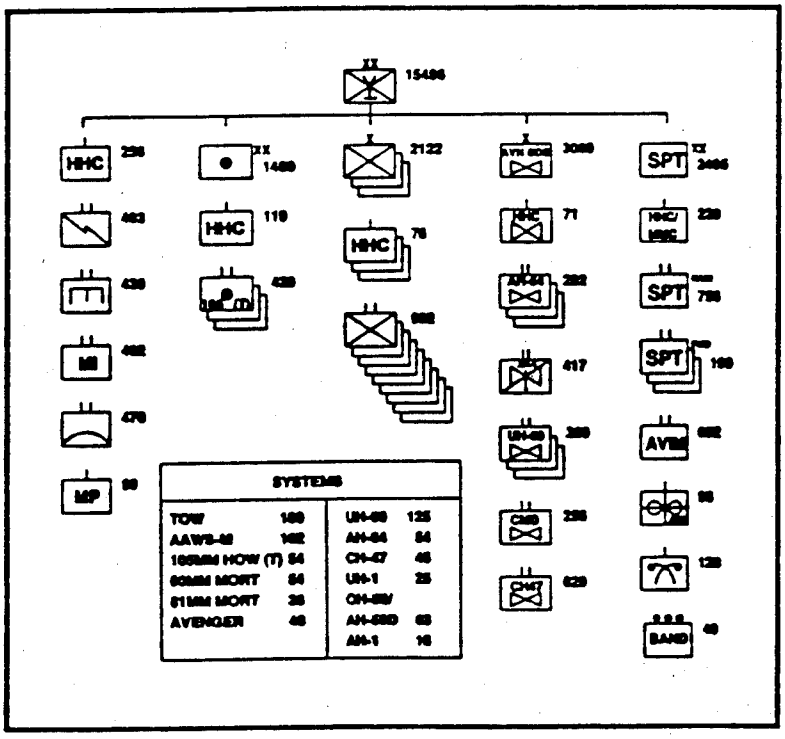



*Figure 2. Air assault division*

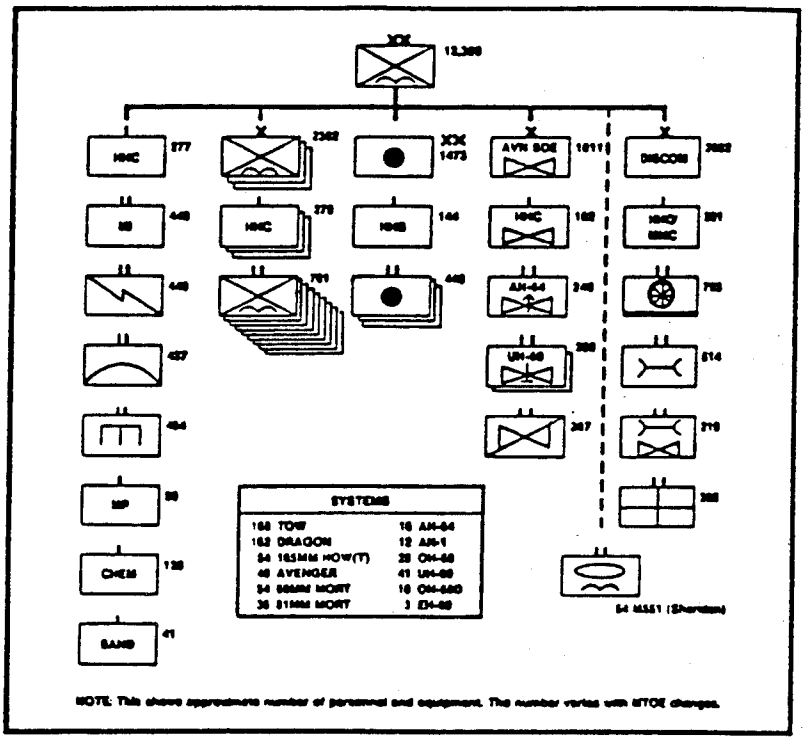
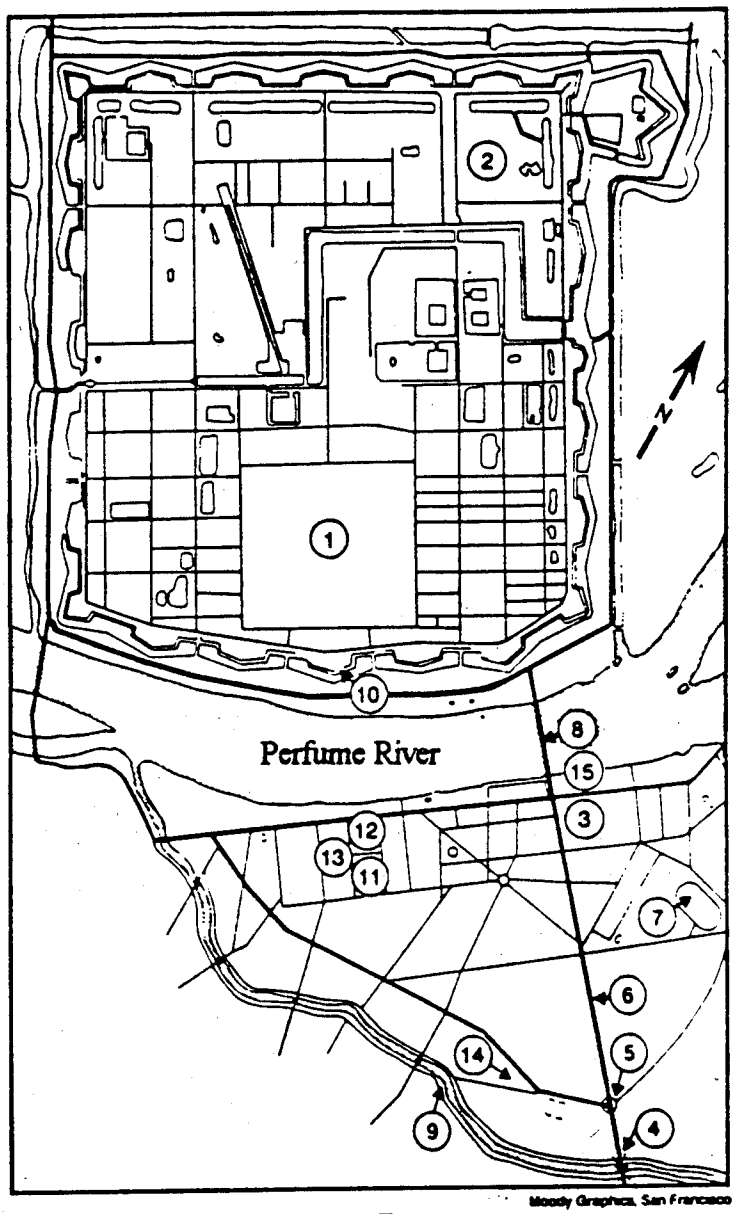



*Figure 3. Airborne division* 92

APPENDIX - C

**Map of Hue**



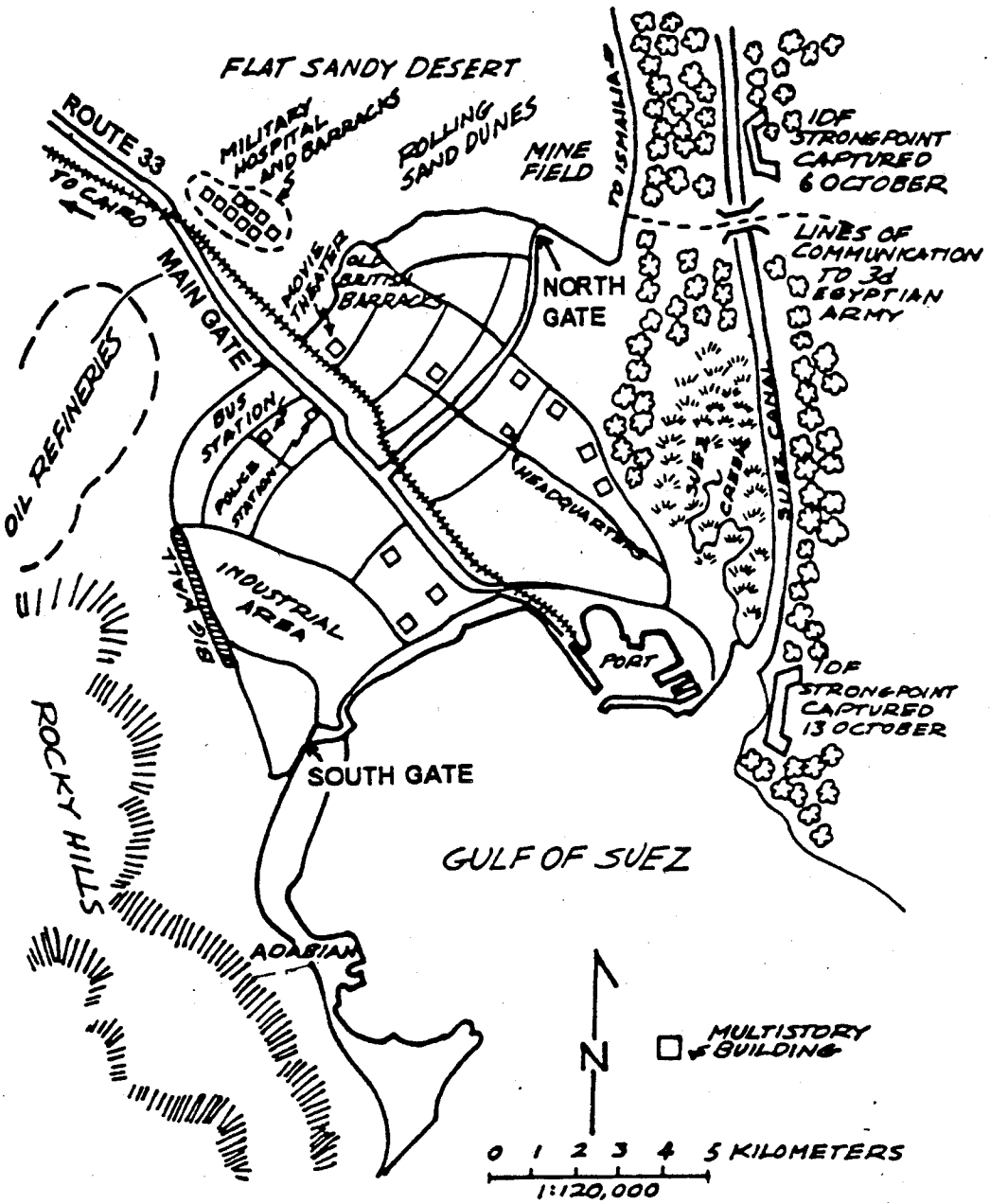

**HUE**

1. Imperial Palace
2. 1st ARVN Division CP
3. MACV Compound
4. An Cuu Bridge
5. Traffic Circle
6. Cane Field Causeway
7. Tu Do Stadium
8. Nguyen Hoang Bridge
9. Phu Cam Canal
10. Citadel Flagpole
11. Thua Thien Provinicial Prison
12. Thua Thien Provincial Admin. Center
13. Hue Municipal Power Station
14. Hue Cathedral
15. Doc Lao Park

93

APPENDIX - D

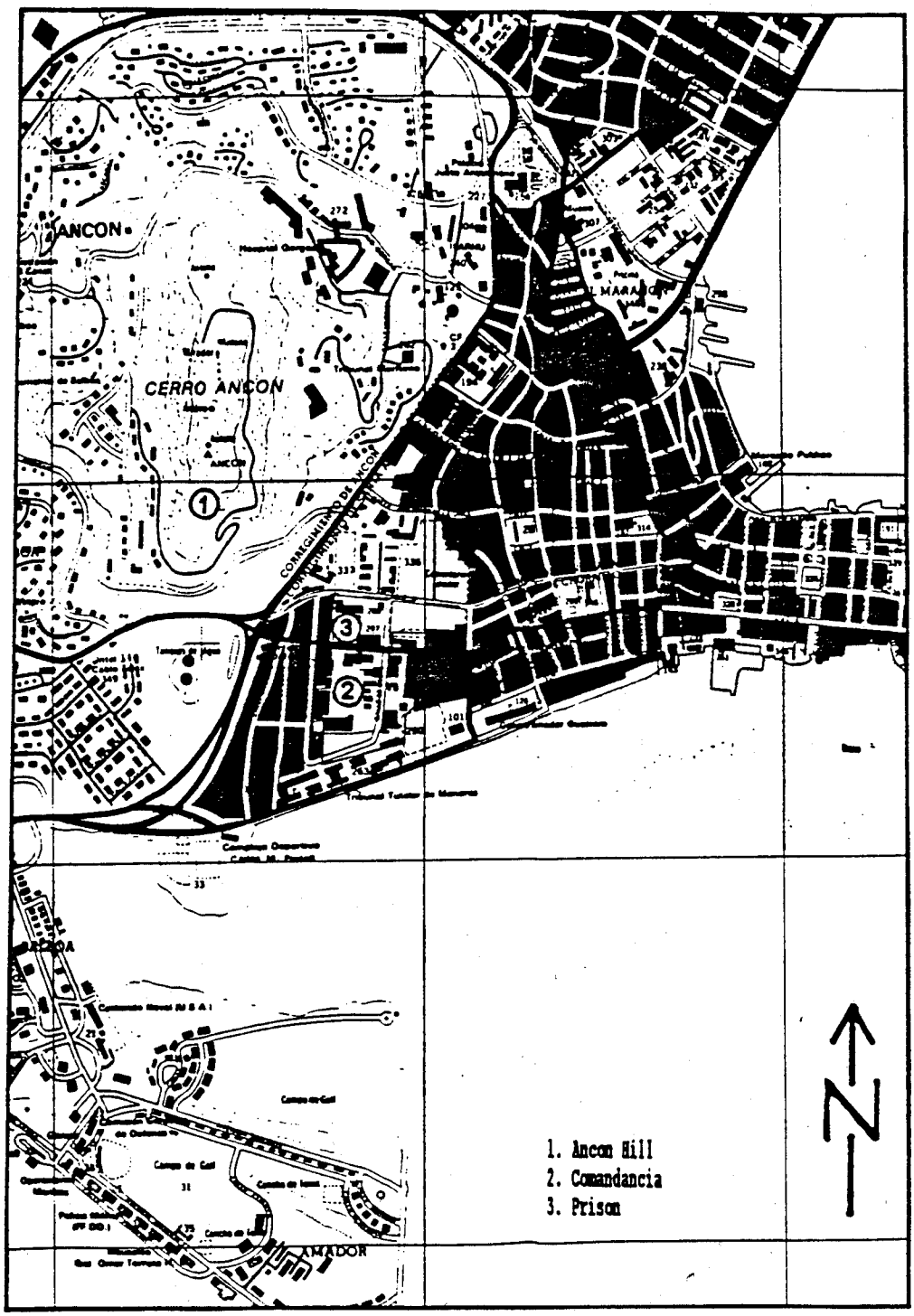
Map of Suez City




SUEZ (OCTOBER 1973) BATTLE SKETCH 94

APPENDIX - E

**Map of Panama City**



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19. "The Soldier Armed: The XM8 AGS", p. 57.

20. MAJ Lou Dimarco, phone interview by MAJ Alan M. Mosher, 24 September 1993. MAJ Dimarco stated that the current light armor battalion Table of Organization and Equipment (TOE) would have 58 tanks and no mortars or scouts. He is the chief of platoon doctrine in the doctrine division of 2-16th CAV, U.S. Armor Center, Fort Knox, Kentucky.

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54. Ibid., p. 152.

55. Ibid., p. 300.

56. Ibid., p. 152.

57. Steven L. Parish, "Light Tap with a Strong Arm: Doctrine and Employment of Marine Corps Armor From 1965 - 75," Armor (September - October 1992), p. 20.

58. Glenn F. Rogers, "The Battle of Suez City," Military Review (November 1979), p. 29.

59. R.D. McLaurin and L. W. Snider, Recent Military Operations in Urban Terrain, (Alexandria, VA: Abbott Associates Inc., July 1982), p. 4.

60. Ibid., p. 15.

61. Ibid.

62. Rogers, p. 30.

63. Ibid., p. 32.

64. McLaurin and Snider, p. 8.

65. Avraham Adan, On the Banks of the Suez: An Israeli General's Personal Account of the Yom Kippur War, (Jerusalem: Presidio Press, 1980), p. 427.

66. McLaurin et al, p. 85.

67. Ibid.

68. Rogers, p. 32.

69. McLaurin et al, p. 86.

70. Ibid.

71. Ibid.

72. MAJ John Allison, USMC, interviewed by MAJ Alan M. Mosher, 20 August 1993. MAJ Allison stated that infantry training with tanks was weak to non existent. Infantry MOUT training with LAV-25's was much better because they ride in them. MAJ Allison was a LAV company commander during Operation Just Cause and the Los Angeles riots. He was the assistant G-3 operations officer for 1st Marine Division in Mogadishu, Somalia.

CPT Frank Sherman, phone interview by MAJ Alan M. Mosher, 29 October 1993. CPT Sherman was the C co 3-73 Armor commander during Operation Just Cause. CPT Sherman stated that his company did not conduct MOUT training with any Marine, Ranger, 5th Infantry Division (Mech), or 7th Infantry Division unit prior to hostilities. Leaders did conduct rehearsals for three weeks before the invasion. Prior to attachment to other units, C co 3-73 Armor had at the most six hours to conduct coordination. Most of that time was spent moving to new locations. He stated that none of the infantry units outside the 82nd Airborne had trained with tanks in MOUT. Most soldiers did not even know that there was a rear deck phone on the Sheridan. On one occasion friendly forces fired on Sheridans during a link up operation. He stated that although the

Dignity Battalions demonstrated periodic stubborn resistance, the opposing fire was not intense. The anti-tank threat was very small. There was no anti-tank mine threat and very few RPG's. He identified a need for MOUT tank gunnery training. Prior to Just Cause, Sheridan gunnery training took place at ranges from 1200m to 2800m. Most engagements in Panama City were from 30m to 200m.

73. Kevin J. Hammond and Frank Sherman, "Sheridans in Panama," Armor (March - April 1990), p. 8.

74. Thomas Donnelly, Margaret Roth, and Caleb Baker, Operation Just Cause: The Storming of Panama, (New York: Lexington Books, 1991) p. 368.

75. Ibid., p. 140.

76. Hammond and Sherman, p. 8.

77. Ibid. The Sheridans presence was kept a secret to avoid giving away the existence of Just Cause. The tanks were kept hidden all day and only taken out briefly at night to conduct maintenance. There was no opportunity to conduct training with light infantry forces.

78. Ibid., p. 11.

79. Ibid.

80. Ibid.

81. Donnelly, Roth, and Baker, p. 368.

82. Ibid.

83. J.W. O'Connell, "Is The United States Prepared to Conduct Military Operations on Urbanized Terrain?" (Thesis, U.S. Naval War College, February 1992) p. 28.

84. Ibid.

85. Ibid., p. 27.

86. Hammond and Sherman, p. 15.

87. Boyko, p. 32.

88. McLaurin et al, pp. 14 - 16.

89. Desobry, p. 12.

90. Richard E. Simpkin, Race to the Swift: Thoughts on

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91. FM 17-18, pp. 4-2 and 6-2.

92. FM 71-100-2, pp. 1-2 - 1-3.

93. Hammel, p. xvi.

94. Rodgers, p. 31.

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