DTIC/TR-99-12

AD-A366079

The DTIC® Review

URBAN WARFARE

Unclassified/Unlimited

Vol. 4, No. 4
August 1999

The* DTIC® *Review is published by the
Defense Technical Information Center (DTIC),
DTIC-BRR, 8725 John J. Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
Telephone: (703)767-8266, DSN 427-8266
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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From - To)
08-1999	Final	August 1999

4. TITLE AND SUBTITLE
The DTIC Review

Urban Warfare
Vol. 4 No. 4

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Cupp, Christian M.; Editor
Levine, Phyllis ; Compiler

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Defense Technical Information Center
DTIC-BRR
8725 John J. Kingman Rd, Suite 0944
Ft.Belvoir, VA 22060-6218

8. PERFORMING ORGANIZATION REPORT NUMBER
DTIC-TR-99/12

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Defense Technical Information Center
DTIC-BRR
8725 John J. Kingman Rd, Suite 0944
Ft.Belvoir, VA 22060-6218

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
A - Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
This publication is published irregularly by the Defense Technical Information Center.

14. ABSTRACT

This issue of the DTIC Review is intended as an overview of the US strengths and weaknesses in Military Operations in Urban Terrain (MOUT), with an emphasis on the readiness of the US Military to undertake modern MOUT missions. Participation in future urban military operations is inevitable. More frequently than in the past future missions will require military operation in the cities and their environs. MOUT are extraordinary in their demands on ground and air forces. Today's armed forces must be prepared to conduct combat operations in cities without undue friendly force losses, noncombatant casualties, and collateral damage.

The material that follows will be of interest to planning for or conducting operations and training in urban areas. The information in this issue is for those forces that could possibly deploy to different parts of the world to provide humanitarian assistance to the populace, assist in the restoration of peace between belligerent forces, and possibly conduct peace enforcement operations.

15. SUBJECT TERMS
Urban Warfare, MOUT, Military Operations in Urban Terrain, OOTW, Operations Other than War, MOOTW, Military Operations Other than War

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE	Unclassified Unlimited		Phyllis Levine
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED			19b. TELEPHONE NUMBER (include area code) 703-767-8266

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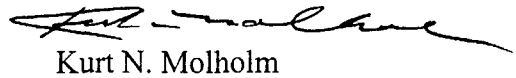
FOREWORD

This edition of *The DTIC Review* brings to the forefront some of the unique problems associated with conducting military operations in an urban environment. Experts predict that more frequently than in the past, future missions will require military operations in the cities and their surroundings.

The editorial staff hope you find this effort of value and appreciate your comments.



Kurt N. Molholm
Administrator

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INTRODUCTION

This issue of *The DTIC Review* is intended as an overview of the US strengths and weaknesses in Military Operations in Urban Terrain (MOUT). Special attention is given to the readiness of the US Military to undertake modern MOUT missions. Consensus predicts participation in future urban military operations is inevitable. More frequently that in the past, future missions will require military operations in the cities and their environs. MOUT are extraordinary in their demands on ground and air forces. Today's armed forces must be prepared to conduct combat operations in cities without undue friendly force losses, noncombatant, and collateral damage.

The material that follows will be of interest to officials and instructors conducting operations and training in urban areas. The information in this issue is for those forces that could possibly deploy to different parts of the world to provide humanitarian assistance to the populace, assist in the restoration of peace between belligerent forces, and possibly conduct peace enforcement operations.

Urban warfare poses many unique challenges not faced by our military forces in recent operations. Of utmost concern is the need to care for the health and welfare of deployed U.S, forces. Disease, the lack of sanitation and death are daily circumstances associated with the collapse of governmental infrastructure, civil war, natural disasters and civil disturbances.

It is not intended to serve as a guide for the conduct of operations and training. Rather, this publication is designed to highlight information and lessons that are applicable to conducting military operations in an urban environment.

The selected documents and bibliography are a representation of the information available on urban warfare from DTIC's extensive collection. Additional references, including electronic resources, can be found at the end of the volume. In-depth literature searches may be requested by contacting the Reference and Retrieval Services Branch at the Defense Technical Information Center: (703) 767-8274/DSN 427-8274; FAX (703) 767-9070; E-mail bibs@dtic.mil

DOCUMENT 1

Protecting Our Own: Fire Support In Urban Limited Warfare

AD-A361891

March 1999

Army War College
Carlisle Barracks, PA

STRATEGY RESEARCH PROJECT

PROTECTING OUR OWN: FIRE SUPPORT IN URBAN LIMITED WARFARE

BY

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USAWC CLASS OF 1999

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USAWC STRATEGY RESEARCH PROJECT

PROTECTING OUR OWN:

FIRE SUPPORT IN URBAN LIMITED WARFARE

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ABSTRACT

AUTHOR: Travis M. Allen

TITLE: PROTECTING OUR OWN: FIRE SUPPORT IN URBAN LIMITED WARFARE

FORMAT: Strategy Research Project

DATE: 2 March 1999 PAGES: 50

CLASSIFICATION: Unclassified

The use of fire support in the urban environment during the conduct of Military Operations Other Than War (MOOTW) and limited warfare is made more difficult by the divergent interests of force protection and the requirements to limit collateral damage and non-combatant casualties. The concept of the "Three-Block War" and the urban battlefield is examined, as is the applicability of the Laws of War. Two historical vignettes are discussed, involving fire support related incidents from the Israeli "Operation Grapes of Wrath" and the U.S. operations in Somalia. Future developments are discussed and conclusions are given.

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PREFACE

I began thinking about the subject of this paper when working in a training cadre, teaching Marines the finer points of special operations prior to their overseas deployments. One of my specific responsibilities was to instruct in the application of supporting arms, particularly indirect fire weapons such as artillery, naval gunfire, and mortars as well as close air support from fixed-wing aircraft and attack helicopters. The existing course did not spend much time on the incidental or unintended damage that we might cause during the application of this firepower. In the process of adding this subject to the training syllabus, I began thinking in a more general way about the application of this kind of power on the battlefield of the future, and what difficulties it might hold.

I thought back to two incidents during the Gulf War where I served as an attack helicopter pilot in support of the Marine Corps Task Forces pushing north to liberate Kuwait. The first came during the start of the air war while I was operating out of Saudi Arabia. We had just finished our first mission of the war where we had engaged and destroyed an Iraqi outpost that had pinned down a reconnaissance team on the border north of Khafji. We were handed off to an airborne forward air controller (FAC) in an OV-10 who had sighted a truck pulling into a garage in a small coastal village farther north in Kuwait and was ready to control my section in attacking this target. Upon questioning him, I determined that it was not a military vehicle (not necessarily disqualifying it as a target since the Iraqis were operating a wide range of civilian vehicles in the area at the time) and that there was not any obvious military nature to the building. I did not know much about the Laws of War at the time, but it seemed to me that unless we were pretty certain that the house was full of Iraqis soldiers we probably should not attack it. The possibility of knocking down a house full of Kuwaitis civilians who had just popped out to the corner store for a few essentials did not square in my mind with our overall mission of liberating Kuwait. I passed on the mission, but spent more time than was healthy questioning if I had done the right thing.

The second incident occurred while pushing into Southern Kuwait with the First Marine Division. A ground FAC with a tank unit had located an Iraqi observation post and wanted me to engage it with a Hellfire missile. We ran through the normal coordination for the mission, but when I released the missile it either malfunctioned, or more likely homed in on the underspill from

the controller's targeting laser, and landed a few meters in front of FAC's tank. I was sickened at having come so close to killing some of my fellow Marines (the FAC seemed to take it in stride however). I had never seriously given much thought to the possibility of killing someone I really did not intend to (a mark of my inexperience) and it was with some trepidation that I released a second missile, which did the intended job.

These incidents had a marked effect on me (particularly the second), and are fresh in my mind several years after the fact.

With the Marine Corps' current focus on urban operations in general and limited war, as well as military operations other than war (MOOTW), I once again began thinking about how we can use the firepower that fire support brings to the battlefield. I have set the scope of this paper on the lower end of the combat intensity spectrum, not because collateral damage and non-combatant casualties are not a concern in general war, but because the likelihood of our encountering non-combatants on the battlefield is significantly greater in limited war and MOOTW.

Rather than repeat "limited war and MOOTW" over and over through this paper, I have settled on merely saying "limited war" to mean all combat operations short of a general war. This is a much looser definition than will be found in Joint Publication 1-02 (Dictionary of Military and Related terms), but I hope the reader will not object.

PROTECTING OUR OWN: FIRE SUPPORT IN URBAN LIMITED WARFARE

> *We didn't kill them with prior intent. We killed them because the yawning gap between the unlimited sacrosanct importance which we attribute to our own lives and the very limited sacred character we attribute to the lives of others allowed us to kill them.*
>
> — Arieh Shavit[1]

As warfighters, members of the United States military services take it as an article of faith that their country will use all the means in its power to protect them. They know that the lives of a country's service members are its most precious commodity and that their service will spare no effort to prevent their unnecessary death, to rescue them if isolated, and even recover their body if killed. This is the sacred, unspoken pact between the service and the warrior; *We will not forsake you, we will not abandon you, if you die we will bring your body back to your family.*

These precepts are deeply instilled in all our services, but in particular our ground combat forces. Men will not fight well or for long without this faith in their comrades and service. The capability and will to protect our people must be absolute.

As I will show, this *sine qua non* of combat is often in conflict with the tenets of "Just War" theory, particularly these:[2]

- That certain parts of the population, especially noncombatants, be immune from intentional attack.
- That the damage likely to be incurred by the war may not be disproportionate to the injury suffered.
- That only legitimate and moral means may be employed in prosecuting war.

This ethical tension, the basic conflict between a warfighter's duty to his comrades and his duty as a member of a professional military is nowhere more evident than in limited urban combat. The confluence of a hostile force embedded within a larger mass of unarmed civilians, and the incredible destructive power of the modern military makes for hard choices over who lives and who dies. And, as we shall see, the likelihood of U.S. forces participating in urban military operations of this kind is increasing.

THE THREE BLOCK WAR

> *When Marines deploy into urban areas today and in the future, they will need the flexibility to address a wide variety of crises. In one city block, a Marine will provide food, care, and comfort for an emaciated child. In the next block, you will see this Marine with outstretched arms, separating two warring tribes. Then, in a third city block, this same Marine will engage in intense house-to-house fighting with hostile forces.*
>
> — Gen. C. C. Krulak[3]

The "Three Block War" is a construct used in the Marine Corps to focus attention on the problems of future (and some would say present) urban operations. The basic concepts are:

- That an increase of urbanization and concurrent shift in world demographics to city dwelling will occur with over 60% of the world's population living in cities by 2025.[4]
- That these cities will be prone to instability and conflict due to overcrowding, food and water shortages, under/unemployment, crime, and infrastructure deficiencies caused by uncontrolled growth.[5]
- That U.S. military forces shall continue to deploy to these urban centers to conduct Operations Other Than War (OOTW), such as peacekeeping, peace enforcement, and humanitarian relief missions. They may also be called upon to conduct general and limited war in the urban environment.[6]

A key feature of these operations will be the necessity to operate "light" but be able to fight "heavy". Politically and practically, U.S. forces will not be able to conduct the humanitarian piece of the "Three Block War" from the inside of a tank or bunker. U.S. forces will be intermingled with the local populace, normally with only their personal weapons available for defense. Nevertheless, when operations shift to combat, they

must be able to ensure the survivability of their force, and by extension, their mission. Accurate, responsive urban fires will provide this capability; indeed, this firepower may often prove to be the only thing that can.

During the Cold War, both U.S. and Soviet doctrine preached avoidance of urban conflict. Experience showed that urban centers were to be isolated and bypassed whenever possible. But recent U.S. and Russian experiences have lain to rest the idea that we can avoid urban operations. The unhappy truth is that the overwhelming trend is towards more military involvement in urban settings, not less. The increasing chaos in these future megacities will yield trouble that only a large, well-organized military force can overcome. The U.S. military may be ordered to a city to restore order, rebuild infrastructure, provide medical care, or hand out food and supplies; but it will be ordered there with greater and greater frequency. Moreover, all too often, once there, it will find it necessary to fight.

THE URBAN BATTLEFIELD

> *Urban warfare is regarded as an exception, an occasional and unhappy accident, far away from the mainstream. War, when properly conducted, according to human superstition, belongs in civilisationless open countryside.*
>
> — S.L.A. Marshall[7]

The urban battlefield may be thought of as being made up of two main parts. The first is the city's inanimate physical structure; the terrain, road network, buildings, districts of various use, and supporting infrastructure such as the water distribution network, power lines, and sewage system. But a city also has a corporal being that it derives from its inhabitants. Much as some terrain is harder to fight on than others, different populations will cause different challenges in urban combat.

The physical terrain that military forces must consider in urban combat varies immensely. The large megacities in which it may find itself may have one or more business or manufacturing centers with an orderly street layout and large, multistory buildings. Ringing these city centers however, will be an ever-expanding mass of residential neighborhoods and slums, some of which will be haphazardly laid out in an undocumented and bewildering maze. Construction of buildings will vary from reinforced concrete, glass, metal, and masonry high-rises, to cardboard and tin shacks. The slums will be the areas of focus for humanitarian efforts and counterinsurgency operations, though military operations will take place throughout the dizzying three-dimensional area of urban sprawl, from subterranean tunnels and sewer lines, to the tops of the highest skyscrapers.[8]

The population will be increasingly young, under-educated, under-employed, hungry and dissatisfied. Within their mass will move well-armed criminals, gangs, and insurgents. There may or may not be an operating government with a police force or military. There may be organized militia factions or clans, seeking to establish control over part or all of the city or country.

Operating in the same area, but often with different agendas and varying desires for cooperation, will be an array of international relief organizations. Private Voluntary Organizations (PVO's), Non-Governmental Organization's (NGO's), and foreign governmental entities will simultaneously request assistance from U.S. military forces and seek to maintain a non-aligned and independent nature. They will certainly not willingly provide intelligence information in support of any combat operations, nor will they necessarily observe military restrictions on their movements.[9] Through the very nature of their mission, "to provide humanitarian assistance wherever it is needed" regardless of political or religious affiliation,[10] the military will find these workers in the slums and residential centers that threaten to become the focal point for armed conflict. They may even be found providing direct humanitarian assistance to armed groups in conflict with U.S.

military forces. Separating their activities from military combat operations will be extremely difficult.

Finally, the independent media will be found in full force on the urban battlefield, as will the information warriors of our future opponents. The ability to independently record and broadcast in real-time, worldwide, every instance of collateral damage or non-combatant or friendly casualty from the remotest area, gives great advantage to any future belligerent. The ability to erode popular support at home or mission legitimacy throughout the world will be a potent weapon.[11]

URBAN FIRE SUPPORT, ROE, AND NON-COMBATANT CASUALTIES

> *No one likes CNN to show civilians wounded or killed in urban combat, but I would rather see that than see American soldiers/Marines being dragged through the streets.*
>
> — Captain, U.S. Marine Corps[12]

Fire support brings great destructive power to the battlefield. Area weapons, such as artillery or unguided aviation delivered ordinance, are casualty producers by design, and can rapidly reduce an urban target to ruin. Even precision guided munitions of great accuracy can produce undesired collateral damage and casualties.[13]

U.S. military doctrine recognizes this problem. The following extracts are typical:

> Urban operations … create difficult moral dilemmas due to the proximity of large numbers of civilians. Commanders must enforce discipline in their operations to minimize unnecessary collateral damage and civilian casualties.
>
> — Operations, FM 100-5[14]

> The probability is great that United States Forces will become engaged by enemy forces who are intermingled with the civilian population.
>
> The presence of civilians and the desire to limit collateral damage can restrict the use of fires and reduce firepower available to the commander.
>
> — An Infantryman's Guide to Combat in Built-up Areas, FM 90-10-1[15]

U.S. rules of engagement provide guidance to the commander in these situations as shown in this extract from the Joint Chiefs of Staff Standing Rules of Engagement (SROE).

> **Inherent Right of Self-Defense**. A commander has the authority and obligation to use all necessary means available and to take all appropriate action to defend that commander's unit and other U.S. forces in the vicinity from a hostile act or demonstrated hostile intent. Neither these rules nor the supplemental measures activated to augment these rules limit this inherent right and obligation. At all times, however, the requirements of necessity and proportionality as amplified in these SROE will be the basis for the judgment of the commander as to what constitutes an appropriate response to a particular hostile act or demonstration of hostile intent.
>
> — Joint Chiefs of Staff Standing Rules of Engagement[16]

The intent of this passage is fairly clear; do what is necessary to protect your forces, but be judicious rather than

indiscriminate. The final decision is left to the commander and his opinion will, presumably, be accepted without many questions. Except of course, it is not that simple.

The prospect of non-combatants slain, intentionally or not, by the U.S. military is only slightly less disturbing to the American people than the prospect of friendly casualties. Non-combatant casualties and collateral damage are primary cause of international approbation and leads host nations to invite a military force to leave. These things are to be avoided, both from a moral and a practical view.

This desire to avoid unnecessary collateral damage and all non-combatant casualties invariably leads to investigations and recriminations when they occur. For example, at least seven instances of soldiers and Marines firing their weapons in Somalia were criminally prosecuted during the U.S. involvement there. While these prosecutions may have been warranted, and some of the accused were convicted of criminal wrongdoing, the end effect on the deployed force should be obvious. Military personnel, press, and other commentators perceived that investigation and/or prosecution would follow every shooting.[17] This had a restrictive effect on the service member's inclination to fire their weapons even when warranted, and took some time for the commanders on the ground to overcome. Similar

events and reactions were found during the U.S. intervention in Panama in 1989, and during the Vietnam conflict.[18]

Of course, it is really the mission commander on the ground who is caught between the proverbial "rock and a hard place". On one hand, he has the duty and the understandable personal desire to see that none of his subordinates come to any harm. On the other, he has the moral and command responsibility to ensure the safety of the non-combatants in his area of operations. The commander is expected to complete his mission without causing it to be curtailed due to domestic outrage over U.S. casualties or international and U.S. outrage over non-combatant casualties.

Of even greater difficulty to the commander is the use of fire support in these situations. The possibility of collateral damage and non-combatant injury is so great that ROE usually restricts approval of the use of these weapons to senior officers. In Operation Just Cause, the invasion of Panama to oust the dictator Manuel Noriega in 1989, the use of AC-130's, attack helicopters, artillery, and mortars required the approval of a battalion commander or equivalent (Lieutenant Colonel). Fixed-wing close air support required the approval of a division commander (Major General) or higher![19] ROE restrictions of this magnitude not only delay the application of this firepower, often beyond the limits of usefulness, but they plainly have the

ancillary effect of discouraging the use of these weapons systems.

URBAN FIRES AND THE LAW OF WAR

War is cruelty, and you cannot refine it.

— W. T. Sherman[20]

If it is difficult to reach clear consensus on appropriate restrictions for the use of firepower in limited urban combat among members of the U.S. military, it is almost impossible to do so among the international community. Opinions vary considerably depending on the relative importance one places on the lives of the non-combatant civilians compared to the lives of the deployed service members and one's overall involvement with the conflict.

Involving non-combatant civilians in military operations, either by specifically firing upon them or using them as shields against enemy fire is prohibited.[21] Additionally, an attacker must take all reasonable steps to minimize loss of life during attacks on military objectives.[22] Responsibility for non-combatant casualties caused through the intentional use of civilians to discourage attack has traditionally fallen on the party using the civilians as shields rather than his adversary. Incidental casualties were a "cost of war", and no one could

blame a belligerent for the deaths of non-combatants placed in harm's way by an adversary, as long as the attacker exercised ordinary care.[23] In fact, some scholars have viewed that customary law allows the attack of military targets even when a defender has "immunized" the target from attack by surrounding it with non-combatant civilians. To act otherwise would be to actually increase the likelihood that a belligerent would use this (illegal) tactic again.[24]

There is not complete agreement on this point however. The 1977 Protocol I to the 1949 Geneva Conventions sought to shift some of the responsibility from the defender to the attacker for non-combatant casualties caused by using civilians as shields from attack.[25] Specifically, it placed a prohibition against attack of civilians unless they participated directly in hostilities.[26] The United States and other countries (including Iraq) refused to ratify the treaty because of the obvious restrictions on the conduct of warfare.[27]

Protocol I also attempted to codify the principle of proportionality, and even though the U.S. did not become a signatory to the protocol, it does recognize the concept of proportionality as customary law, and observes it as such.[28]

The classic example of a disproportionate action usually given is the destruction of a village and its inhabitants to kill a single sniper.[29] But the concept becomes less clear when

the situation is reworded thus, "Is it disproportionate to fire into a large mob within which are intermingled a few belligerents who have trapped and are about to kill one of your men?" Many military officers and legal experts would say "No problem, that's the cost of waging war." However, under the conditions of Protocol I (which has been ratified by numerous countries and which is considered international law by such bodies as the International Red Cross),

> "the presence of a few isolated soldiers or guerrilla fighters among a crowd of civilians cannot justify a full-scale attack on the crowd; if there are no other means available, their elimination will have to be postponed."[30]

The basic question that we are left with is simply, "How many non-combatant civilians should a country be willing to kill to ensure the safety of its service members"? Like in so many other things, the answer depends on where you sit.

HISTORICAL VIGNETTES

With a better understanding of the issues involved in the use of fire support during military operations in limited urban combat, we turn to two historical vignettes which provide insight into the real difficulties and far-reaching consequences to be found in this environment.

The first example is from the Israeli campaign in South Lebanon known as "Operation Grapes of Wrath". The second example

is from the UN peacekeeping mission to Somalia, and specifically the U.S. conduct of a campaign to arrest the Somali clan leader Mohamed Farah Aideed.

QANA: BLOOD FLOWS WHERE CHRIST TURNED WATER INTO WINE

(The) civilian population constitutes our defensive belt.

— Hizballah leader, Mohammed Raad[31]

On 18 April 1996, Hizballah[32] guerrillas manned a mortar emplacement approximately 220 meters southwest of the United Nations' Interim force in Lebanon (UNIFIL) compound in the village of Qana in Lebanon, and fired on an Israeli patrol in South Lebanon. Israeli radar located the firing site and Israeli artillery initiated a counter-battery 155mm artillery mission against the Hizballah mortar team, firing approximately 17 shells that landed in and around the UNIFIL camp. The bombardment killed over 100 Lebanese refugees in the camp and wounded a greater number, including four UN peacekeepers.[33]

BACKGROUND.

The Israeli Government launched Operation Grapes of Wrath on April 11, 1996, in response to numerous Hizballah operations in South Lebanon and Northern Israel during the preceding months.[34] As part of the campaign, the Israelis conducted an Information

Warfare operation with the aim of moving the civilian population out of South Lebanon to the north. The Israelis had used the same tactic in a previous campaign, Operation Accountability, in July 1993.[35] A broadcast from April 13, 1996 is typical:

> In light of the continued terrorist actions by Hizballah, the Israeli Army will intensify its activities against the terrorists stating tomorrow, 14 April 1996. Following the warning broadcast by the Voice of the South to the inhabitants of 45 villages, any presence in these villages will be considered a terrorist one, that is, the terrorists and all those with them will be hit. Any civilian who lags behind in the aforementioned villages and towns will do so on his own responsibility and will put his life in danger.[36]

While over 400,000 Lebanese civilians fled to the north in response to the fighting, several thousand took refuge in the UNIFIL base camps throughout South Lebanon.[37]

The UNIFIL camp in Qana was manned by the headquarters unit of a Fijian Battalion. Over 800 Lebanese refugees had taken shelter in the camp, including the families of Hizballah guerillas. Hizballah used the area around the UNIFIL camp to make rocket and mortar attacks against Northern Israel and Israeli forces in Lebanon on numerous occasions.[38] On 15 April Hizballah shot and wounded a Fijian officer when he tried to prevent the guerrillas from firing rockets from a location approximately 220 meters from the camp.[39]

THE INCIDENT.

On 18 April, Hizballah fired two separate volleys of Katyusha rockets from locations around the camp. Around noon they set up a mortar and two hours later began a short mortar barrage. The target was an Israeli patrol in South Lebanon. According to Maj. Gen. Matan Vilna'i of the Israeli Army:

> The mortars began falling 100 meters from the force, then 30 to 40 meters, with shrapnel falling right beside our soldiers. We acted in a matter of minutes to extricate the unit. In that time we had to understand what was going on, to relay orders and to stop the enemy fire.[40]

At 1:52 and 1:58 PM Israeli counter-battery radar indicated two separate locations in Qana where the firing had originated. A crosscheck of the coordinates revealed their proximity to the UNIFIL camp and permission was sought and obtained from higher headquarters to engage the targets. Target coordinates were transmitted to two Israeli artillery batteries, and the missions were fired within 15 minutes of initial detection.[41]

The results were horrific. About half of the Israeli shells fired fell in the UN camp[42]. The refugees had no shelters to protect them, and the destructive power of the barrage was so great that many of the refugees were torn to pieces. No definite death count was possible because of the total dismemberment of some of the dead.[43]

THE AFTERMATH.

The repercussions from the attack were immediate and widespread. Israel was condemned by most nations, international organizations, and the media. Hizballah and their supporters charged that Israel had intentionally attacked the refugees in the camp. Criticism of the killings was widespread in Israel itself. The United Nations commissioned an investigation that concluded:

> "While the possibility cannot be ruled out completely, it is unlikely that the shelling of the United Nations compound was the result of gross technical and/or procedural errors."[44]

In some ways, the Israelis were victims of their own prior success and claims of precision. A combination of counter battery radar, remotely piloted vehicles (RPV's), and ground and air spotters had enabled previous artillery strikes to be conducted with great accuracy. The Israeli Army contended that though there was an RPV and two helicopters in the area, these assets were not positioned to adjust the artillery fire at Qana.[45] Though they released video and timelines demonstrating that there was no aerial observation of the barrage,[46] their presence and Israel's demonstrated capability were sufficient proof of intent for their critics.[47]

In the face of this tumult of criticism and accusation, Israel and the United States hurriedly negotiated a cease-fire

with Lebanese and Syrian officials representing Hizballah[48]. The successful Israeli military campaign had been halted, not by enemy resistance, but by international outrage over collateral damage and non-combatant casualties.

MOGADISHU: DISASTER, THEN RETREAT

Kasoobaxa guryaha oo iska celsa cadowga! (Come out and defend your homes!)

— Somali militiamen[49]

On the afternoon of 3 October 1993, a joint unit of U.S. Special Operations forces[50] and U.S. Army Rangers executed a raid in Mogadishu, Somalia, to capture several top members of Somali clan leader Mohamed Farrah Aidid's organization. The mission initially went well, however, the raid force almost immediately came under fire from Somali gunmen and the situation rapidly deteriorated. It took fifteen hours to extract the raid force at a cost of 18 U.S. dead and 73 wounded, one Malaysian soldier dead and six wounded, two Blackhawk helicopters shot down and several others damaged, and 500 to 1000 Somalis killed with over 1000 Somalis wounded. An American pilot was held captive for ten days and the mutilated bodies of U.S. servicemen were dragged through the streets of Mogadishu by jeering mobs.[51 & 52]

BACKGROUND.

The conflict in Somalia and the U.S. involvement there were rooted in a legacy of European colonialism and superpower conflict. Somalia's boundaries were based on the artificial divisions decided when the Italians, French and British divvied up the Horn of Africa in the 1880's. The Somali Republic emerged as a nation following the joining of the British and Italian administered Somalilands in 1960.[53] Under the military dictator Siad Barre and hungry for arms to contest the ill-defined border with Ethiopia, Somalia aligned with the Soviet Union. When the Soviets sided with Ethiopia in the conflict, Somalia's fortunes turned. Defeated by the Ethiopians, Siad Barre switched to the Western Bloc and alliance with the United States. After twenty-one years of rule, he was overthrown in a civil war, fleeing the country in January 1991.[54]

Humanitarian relief efforts had begun early in the civil war, spearheaded by numerous PVO's, NGO's, and UN agencies. But by the end of 1991 the problems on the ground had grown immense; 20,000 casualties, 600,000 refugees, and several hundred thousand internally displaced persons. Even more significant, the fighting had grown so bad that the relief agencies were forced to withdraw or curtail their operations.[55]

Large-scale U.S. military involvement began in 1992 in Somalia spanned three phases known by their UN designations;

United Nations Operations in Somalia (UNOSOM) I, Unified Task Force (UNITAF), and UNOSOM II. The U.S. military primarily provided airlift support in the distribution of humanitarian supplies during UNOSOM I.[56] During the UNOSOM I/UNITAF phase, the U.S. military formed the core of the UNITAF which was directed to stabilize the country and provide security support for UNOSOM I.[57] UNOSOM II replaced UNOSOM I/UNITAF with a permanent UN peacekeeping force and a mandate to continue the stabilization and rebuilding of Somalia.[58] But as trouble with clan leaders escalated, particularly with the leader of the Habr Gidr clan, Mohamed Farah Aideed, and UN casualties grew, another mission emerged for the U.S. military. A Special Forces unit was deployed to Mogadishu to hunt down Aideed, Task Force Ranger.[59]

THE INCIDENT.

The raid on 3 October 1993 in downtown Mogadishu was the turning point in U.S. involvement in Somalia. Grossly underestimating the capabilities and resolve of Aideed's militia, the raid force was quickly pinned down at the raid site by hundreds of militia fighters. Additional irregular volunteers spontaneously joined the fighting, adding firepower to Aideed's forces.[60] Compounding the problem was the downing of two Blackhawk helicopters close to the raid site. This forced Task

Force Ranger to split its forces on the ground and defend disparate locations.[61]

Fire support assets allocated for raid were two AH-6 "Little Bird" attack helicopters armed with 7.62mm mini-guns and 2.75" rockets, and MH-60 Blackhawk helicopters carrying 7.62mm door guns and airborne snipers.[62] The pilots and crews of MH-6 "Little Bird" assault helicopters also provided limited airborne small arms fire. The relief column that eventually rescued the raid force had vehicular mounted .50 caliber machine, MK-19 40mm automatic grenade launchers, and were supported by Pakistani tanks and APC's with Italian tanks available as well.[63] An OH-58 helicopter and Navy P-3 aircraft circling overhead provided airborne command and control.[64]

Official details of the 15-hour battle are difficult to obtain due to the classification of both the mission and the after action reports. But a few things are clear:

- Once the battle had begun, the task force needed large amounts of external fire support. The task force pinned down in the city were too lightly armed to extract themselves, and the reaction force sent to extricate them were too lightly armed to rapidly accomplish the rescue. Once isolated and engaged, fire support was the only way to protect the task force.

- The fire support allocated to the mission was insufficient. In retrospect, the mission required support capable of clearing the numerous roadblocks thrown up by the Somali militia and suppressing the fire from the belligerents that had the raid force pinned down. Commanders in Somalia requested these assets, including tanks, the week prior to the Task Force Ranger raid but were denied.[65] A Senate Arms Services Committee report indicates that General Downing of USSOCOM had requested AC-130 gunships, and the request was denied by General Powell, the Chairmen of the Joint Chiefs of Staff. General Powell testified that when the warplanes had been used earlier in the conflict, "They wrecked a few buildings and it was not the greatest imagery on CNN."[66]
- The raid force did not make use of all of the fire support assets available to them. The 10th Mountain Division had several AH-1F attack helicopters in Somalia which had been used numerous times to provide fire support to UN peacekeeping troops.[67] Though significantly more capable than the AH-6, they were not used during the fight to rescue the raid force. Additionally, direct fire assets which were eventually integrated into the rescue force, Italian and Pakistani tanks and APC's, were not included

in the planning and preparation for the mission, delaying their use.

- As the firefight continued, observation of ROE broke down. Though troubling, numerous members of the raid force and the rescue columns that relieved them have stated in newspaper interviews that they "fired on crowds and eventually at anyone and anything they saw."[68] Both the raid force members and fire support helicopters fired on intermingled crowds of gunmen and unarmed civilians.[69] During the withdrawal, "AH-6 gunships raked the cross streets with fire to support the movement."[70]
- Finally, there does not appear to have been any more of a fire support plan than the Standard Operating Procedures for the participating unit. Once the raid force was trapped on the objective, the mission commander had to make it up on the fly.

THE AFTERMATH.

The inability of the task force to protect themselves and for the reaction force to quickly rescue them exacted a heavy price. Once the realization of what had happened settled in back in Washington, there were almost immediate calls for a pullout of all U.S. forces in Somalia.[71] President Clinton rebuffed these recommendations, but announced a change in direction for the

mission. The three primary points were that reinforcements would be sent in to protect our forces, regional African leaders would be encouraged to work with the Somalis for a lasting peace, and all U.S. forces would be pulled out by 31 March 1994.[72] Reinforcements were sent to Somalia to bolster the Quick Reaction force including the vehicles and fire support assets which had been requested before the raid.[73] Almost all U.S. forces were withdrawn by March, with a few remaining until September.[74] With the U.S. gone and the clan leaders emboldened by their success, the UNOSOM mission eventually failed altogether, and the U.S. assisted in the UN pullout with the last UN forces coming off the beach in Mogadishu on 2 March 1995.

There was widespread outrage over the deaths of the U.S. troops in America. What received little attention were the questions raised in international circles concerning the large number of Somali dead. Africans have described it as a "heartless massacre of defenseless Third World citizens by the U.S. military forces"[75] and "the massacre of Somali civilians in Mogadishu that derailed a UN humanitarian mission."[76]

Perhaps the true toll of the failure of this single mission in Somalia can best be seen in this excerpt from an article co-authored by Mr. Walter Clarke, Deputy Chief of Mission, U.S. Embassy, Somalia, during Operation Restore Hope.

> The Clinton administration's refusal to respond to the genocide in Rwanda that began in April 1994 was due in part to its retreat from Somalia, announced after the deaths of 18 U.S. Army Rangers on October 3-4, 1993. In Bosnia, UN peacekeepers under fire from or taken prisoner by Serb forces over the last two years were expected to turn the other cheek for fear of "crossing the Mogadishu line." This expression, reportedly coined by Lieutenant General Sir Michael Rose, former commander of the United Nations Protection Force in Bosnia (UNPROFOR), describes the need to maintain neutrality in the face of all provocation for fear of becoming an unwilling participant in a civil war. In recent months, the design of the UN Implementation Force in Bosnia has been shaped by what was purportedly learned in Somalia. The doctrines of both the United States and the United Nations were also clearly affected. President Clinton issued a policy directive in April 1994, shortly after U.S. forces left Somalia, that implied a sharp curtailment of American involvement in future armed humanitarian interventions and that marked a retreat from his administration's earlier rhetoric of assertive multilateralism. Similarly, in the 1995 (second) edition of An Agenda for Peace, the fundamental policy document on UN peacekeeping, Secretary-General Boutros Boutros-Ghali expressed less optimism about the possibilities for intervention than he did in the 1992 (first) edition, largely because of the United Nations' searing experience in Somalia. Continuing efforts by congressmen to cut or restrict U.S. contributions to UN peacekeeping are also a direct response to the perceived failures in Somalia.[77]

Having examined these two historical examples, what can one conclude about them? In one, non-combatant casualties ended an entire military campaign. In the other, a failure to plan for and provide effective fire support resulted in unacceptable friendly casualties which eventually caused an entire UN peacekeeping mission to fail. Both incidents had immediate and long-term effects on future operations for the nations involved.

Additionally, the U.S. misadventure in Somalia cast a shadow on future UN missions as well. But together these incidents also show the two sides of the urban firepower paradigm. In the future, the military will absolutely require the decisive power that fire support brings to the urban environment, but it will have to be applied appropriately and effectively. If the U.S. does not develop this capability, it risks more than a few dead soldiers or civilians. It risks the ability to project power to the very places where it will surely need to go.

THE FUTURE

> *Men who take up arms against one another do not cease on this account to be moral beings, responsible to one another and to God.*
>
> — U.S. Army General Order No. 100, 1863[78]

The Department of Defense has begun wide ranging initiatives to improve the U.S. armed forces' ability to use fire support in an urban setting. These efforts revolve around technological answers to the complexities posed by the urban environment, and doctrinal investigations to determine the best methods of employment. To list all the advances planned or being planned would be to grossly exceed the scope of this paper, but the following two categories apply:

WEAPONS EFFECTIVNESS.

- Improved accuracy weapons with variable penetration and explosive characteristics and switchable warhead yields.[79]
- Non-lethal weapons that are deliverable from aircraft and ground based fire support systems.[80]
- Unmanned remote controlled fire support systems that can operate from areas that would not be supportable with a manned system.[81]
- New technology direct fire weapons that provide protection to the user and effective line-of-sight fire support.[82]
- Improved survivability for airborne delivery platforms enhancing the ability to loiter in the target area for better response times and weapons accuracy.[83]
- Loitering weapons that can be launched to an aerial holding area where they wait for a target location to attack.[84]
- War fighting experiments designed to provide insight into fire support employment in future urban operations, such as the Marine Corps' "Urban Warrior" and urban close air support projects.

COMMAND AND CONTROL.

- Target and unit location systems that provide increased accuracy for fire support weapons, reflect up to date information on battlefield changes due to combat effects, and provide situational awareness in three dimensions.[85]
- Improved communications devices for fire support control and coordination that have greater effectiveness and reliability in built-up areas.[86]
- Unmanned aerial and ground vehicles with real-time datalink capabilities to enhance target location, acquisition and fire support mission execution.[87 & 88]
- Improved identification systems able to rapidly discriminate between friendly and enemy units, and possibly combatants and non-combatants.[89]

CONCLUSIONS.

Technology improvements and doctrinal updates are only part of the answer. We must enhance our force structure and training to maximize our ability to operate in the urban environment. We must educate or military and political leaders on the costs and hazards of these operations, so that sound decisions on intervention can be made and so that they and our country will be ready for the brutal reality of future urban warfare. And finally, we must as a nation, and as members of the

international community, develop the persistence and courage to carry out these operations without forsaking our servicemen and women, or our humanity.

Word count: 5872

ENDNOTES

[1] Arieh Shavit, *Ha'aretz* (Tel Aviv), 12 May 1996, quoted in Thomas L. Friedman, "Lebanon's Aftermath," *New York Times*, 15 May 1996, A21. Mr. Shavit was writing concerning the Israeli Defense Force artillery barrage that killed numerous civilians in a UN camp in Qana, Lebanon. The event is discussed later in this paper.

[2] John Brinsfield, "From Plato to NATO; the Ethics of Warfare; Reflections on the Just War Theory," *Military Chaplain's Review* (Spring 1991): 31.

[3] U.S. Department of Defense, U.S. Marine Corps, *A Concept for Future Military Operations on Urbanized Terrain*, Marine Corps Combat Development Command Concept Paper (Quantico, Va., 1997), 6, available from < http://www.concepts. quantico.usmc.mil>; Internet; accessed 28 Jan 1999.

[4] James A. Laswell, "Wall to Wall," *Armed Forces Journal International*, Jan 1998, 37.

[5] U.S. Department of Defense, U.S. Marine Corps, *The Urban Century: Developing World Urban Trends and Possible Factors Affecting Military Operations* (Nov 1997), by Matt Van Konynenburg, Defense Intelligence Reference Document, MCIA-1586-003-98 (Quantico, Va., 1997), 1-2.

[6] Laswell, 37.

[7] Michael Dewar, ed., *An Anthology of Military Quotations* (London: Robert Hale Limited, 1990), 54.

[8] U.S. Department of Defense, U.S. Marine Corps, *The Urban Century: Developing World Urban Trends and Possible Factors Affecting Military Operations* (Nov 1997), 3.

[9] International Committee of the Red Cross (ICRC), *The Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations in Disaster Relief*, Geneva, available as Appendix B to Lisa Davidson, Margaret Hayes, and James Landon, *Humanitarian and Peace Operations: NGO and the Military in the Interagency Process* (Washington, D.C.: National Defense University, Institute for National Strategic Studies Press Book, 1996), available from <http://www.ndu.edu/

ndu/inss/books/ngopvo/ index.html>; Internet; accessed 30 Jan 1999.

[10] Ibid.

[11] Scott E. Packard, "Bottom Line: It's Infantry," *Proceedings*, Nov 1998, 29.

[12] Patrick J. Carroll, Letter to the editor concerning the article "Exerting U.S. Influence," *Marine Corps Gazette*, Jan 1998, 9.

[13] Danielle L. Gilmore, *Precision Guided Munitions and the Law of War* (Fairbairn, Australia: Air Power Studies Centre, 1995), 2.

[14] U.S. Department of Defense, Department of the Army, *Operations*, U.S. Army Field Manual 100-5 (Washington, D.C., 1993), 14-4.

[15] U.S. Department of Defense, Department of the Army, *An Infantryman's Guide to Combat in Built-up Areas*, U.S. Army Field Manual 90-10-1 w/ change 1 (Washington, D.C., 1995), vii & G-5. The updates incorporated in change 1 to the basic manual were directed towards the problems of constrained or restrictive MOUT, specifically issues concerning restriction of collateral damage and non-combatant casualties.

[16] U.S. Department of Defense, Joint Chiefs of Staff, *Joint Chiefs of Staff Standing Rules of Engagement* (Washington, D.C.), available from <http://call.army.mil:80/call/newsltrs/96_6/roeappa2.htm>; Internet; accessed 26 Jan 1999.

[17] Mark S. Martins, "Rules of Engagement for Land Forces: A Matter of Training, Not Lawyering," *Military Law Review*, 143 (Winter 1994): 64-65.

[18] Ibid., 66.

[19] U.S. Department of Defense, U.S. Marine Corps, *Aviation Combat Element Military Operations on Urban Terrain Manual*, Edition VI, MAWTS-1 Instructional Manual (Yuma, Az., 1997), B-29.

[20] Robert D. Heinl Jr., ed., *Dictionary of Military and Naval Quotations* (Annapolis: United States Naval Institute, 1966), 152. From a letter to the mayor of Atlanta, 12 Sep 1864.

[21] U.S. Department of Defense, Department of the Army, *The Law of Land Warfare*, U.S. Army Field Manual 27-10 w/ change 1 (Washington, D.C., 1976), 4-5 of change 1, 106 of basic manual.

[22] Ibid.

[23] Gilmore, 6.

[24] Ibid., 8-9.

[25] Ibid., 5-6.

[26] International Committee of the Red Cross (ICRC), *Handbook on the Law of War for Armed Forces*, by Frederic de Mulinen (Geneva: International Committee of the Red Cross, 1987), 48.

[27] Gilmore, 6.

[28] Ibid.

[29] Ibid.

[30] Frits Kalshoven, *The Law of Warfare* (Geneva: Henry Dunant Institute, 1973), 66.

[31] Mohammed Raad, *al Nahar* (Beirut), quoted in "Misguided," *The New Republic*, 13 May 1996, 7.

[32] The spelling in the UN report cited is used here. More commonly anglicized in the United States as "Hezbollah".

[33] Franklin van Kaplan, *Report of the Secretary General's Military Adviser Concerning the Shelling of the UN Compound at Qana on 18 April 1996 with addendum* (New York: United Nations Secretariat, 1996), UN doc. S/1996/337, reproduced in *Journal of Palestine Studies* 25, no. 4 (Summer 1996): 142-144.

[34] Virginia N. Sherry and Yifat Susskind, *Operation Grapes of Wrath: The Civilian Victims* (New York: Human Rights Watch, 1997), 11.

[35] The stated Israeli goal for this forced exodus was to protect civilians from military action. The cited Human Rights Watch report contends that the goal was to exert pressure on the Lebanese government to disarm guerrilla forces in the south, particularly Hizballah. Sherry, 4-5.

[36] Sherry, 5.

[37] Richard Z. Chesnoff, "A Mideast Cry for Help," with the collaboration of Jennifer Griffin, David Makosvky, and Kenneth T. Walsh, *U.S. News & World Report*, 29 Apr 1996, 41.

[38] Kaplan, 140-141.

[39] Sherry, 47. It is worthy to note that despite this attack, the UNIFIL soldiers continued to try and stop the Hizballah activities adjacent to their camp.

[40] Sherry, 35.

[41] Kaplan, 141.

[42] Ibid., 142.

[43] Bruce W. Nelan, "Qana's Chamber of Horrors," *Time*, 29 Apr 1996, 54-55.

[44] Kaplan, 143.

[45] Ibid., 144.

[46] "Israel Releases Video on Lebanon Shelling," *New York Times*, 9 May 1996, A10.

[47] Steve Macko, "Qana: Was it a Deliberate Attack?," *EmergencyNet NEWS Service Daily Report*, 25 May 1996, Vol. 2 - 146, available from <http://www.emergency.com/qana-rpt.htm>; Internet; accessed 27 Jan 1999.

[48] Tarek Al-Issawi, "Focus Shifts From Battlefield to Diplomacy Following Slaughter in Lebanon," *Associated Press*, 19 Apr 1996, available from <http://www.usnews.com/usnews/news/ap419a.htm>; Internet; accessed 27 Jan 1999.

[49] Mark Bowden and Peter Tobia, "Blackhawk Down," *The Philadelphia Enquirer*, reprint of the series that ran from 16 Nov to 14 Dec 1997, 27. Somali gunmen used megaphones and this rallying cry to assemble to mob that besieged the U.S. forces in this incident.

[50] Civilian reports indicate that both Army and Navy personnel from the U.S. Special Operations Command participated. Unclassified military reports do not address this point.

[51]Bowden and Tobia, "Blackhawk Down," 3. This paragraph is a synopsis of information contained in the introduction to the series.

[52] Chia Chan Sing, Letter to the editor, *Joint Force Quarterly* (Autumn/Winter 1997-98): 9. Malaysian casualty figures were extracted from this letter. Col Sing, the Defense Attache for the Malaysian Embassy in the United States, was writing to correct allegations of Malaysian foot dragging during the raid force rescue which had been printed in a previous issue of JFQ.

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[55] John L. Hirsch and Robert B. Oakley, *Somalia and Operation Restore Hope* (Washington, D.C.: United States Institute of Peace, 1995), 18.

[56] Ibid., 25.

[57] Kenneth Allard, *Somalia Operations: Lessons Learned* (Washington, D.C.: National Defense University Press, 1995), 14.

[58] Ibid.

[59] Bowden and Tobia, "Blackhawk Down," 39.

[60] Rick Atkinson, "Night of a Thousand Casualties," *Washington Post*, 31 Jan 1994, A10.

[61] Ibid.

[62] Bowden and Tobia, "Blackhawk Down," 5.

[63] Atkinson, "Night of a Thousand Casualties," A11.

[64] Bowden and Tobia, "Blackhawk Down," 16.

[65] Bill Gertz, "Senate Report Criticizes Powell's Staff on Somalia Raid," *Washington Times*, 1 Oct 1995, available from <http://www.netnomad.com/powell.html>; Internet; accessed 1 Feb 1999.

[66] Ibid.

[67] Keith B. Richburg, "GIs Learn Perils of City Combat," *Washington Post*, 23 Jun 1993, A1.

[68] Bowden and Tobia, "Blackhawk Down," 3.

[69] Ibid., 8.

[70] Posted account of action from 160th SOAR unofficial web site, available from <http://www.nightstalkers.com/articles/tfranger.html>; Internet; accessed 1 Feb 1999.

[71] Hirsch and Oakley, 128.

[72] Ibid., 129.

[73] George Mason University, Institute of Public Policy, United Nations Peace-Keeping Operations website, *United Nations Operation in Somalia II*, available from <http://ralph.gmu.edu/cfpa/peace/unosom_ii.html>; Internet; accessed 1 Feb 1999.

[74] William J. Clinton, *Text of a Letter from the President to the Speaker of the House of Representatives and the President Pro Tempore of the Senate*, White House Press Release, 1 Mar 1995, available from <http://metalab.unc.edu/pub/archives/whitehouse-papers/1995/Mar/1995-03-01-president-letter-to-speaker-on-troops-in-somalia.text>; Internet; accessed 1 Feb 1999.

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[76] Kevin J. Kelley, "How US Military Blunders Led To a Massacre in Mogadishu," *The East African*, 9-22 Apr 1998, available from <http://www.africaonline.co.ke/eastafrican/980409/REGIONAL/regional20604.html>; Internet; accessed 1 Feb 1999.

[77] Walter Clarke and Jeffrey Herbst, "Somalia and the Future of Human Intervention," *Foreign Affairs*, 75 (March/April 1996): 70-85.

[78] Peter G. Tsouras, ed., *Warrior's Words* (London: Arms and Armour Press, 1992), 206.

[79] U.S. Department of Defense, U.S. Marine Corps, *A Concept for Future Military Operations on Urbanized Terrain*, III-13.

[80] Ibid.

[81] Fred V. Reed, "City Slickers Become Targets of Future Marine Corps Operations," *Signal*, Jul 1998, 52-53.

[82] Packard, "Bottom Line: It's Infantry," 30.

[83] U.S. Department of Defense, U.S. Marine Corps, *MAGTF Aviation and Operational Maneuver from the Sea*, Marine Corps Combat Development Command Concept Paper (Quantico, Va., 1999), 10, available from <http://www.concepts.quantico.usmc.mil >; Internet; accessed 28 Jan 1999.

[84] Forrest R. Lindsey, "Focus on Expeditionary Fire Support," *Marine Corps Gazette*, Jul 1998, 19.

[85] U.S. Marine Corps, *A Concept for Future Military Operations on Urbanized Terrain*, III-9.

[86] Packard, "Bottom Line: It's Infantry," 30.

[87] Lindsey, "Focus on Expeditionary Fire Support," 20.

[88] C. Mark Brinkley, "Sarge Goes Where No One Else Will," *Navy Times (USMC Edition)*, 4 Jan 1999, 27.

[89] Lindsey, "Focus on Expeditionary Fire Support," 20.

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DOCUMENT 2

Urban Warrior Conceptual Experimental Framework

AD-A352261

April 1998

Marine Corps Combat Development Command
Quantico, VA

URBAN WARRIOR

Conceptual Experimental Framework

MARINE CORPS WARFIGHTING LAB

Urban Warrior

Conceptual Experimental Framework

April 1998

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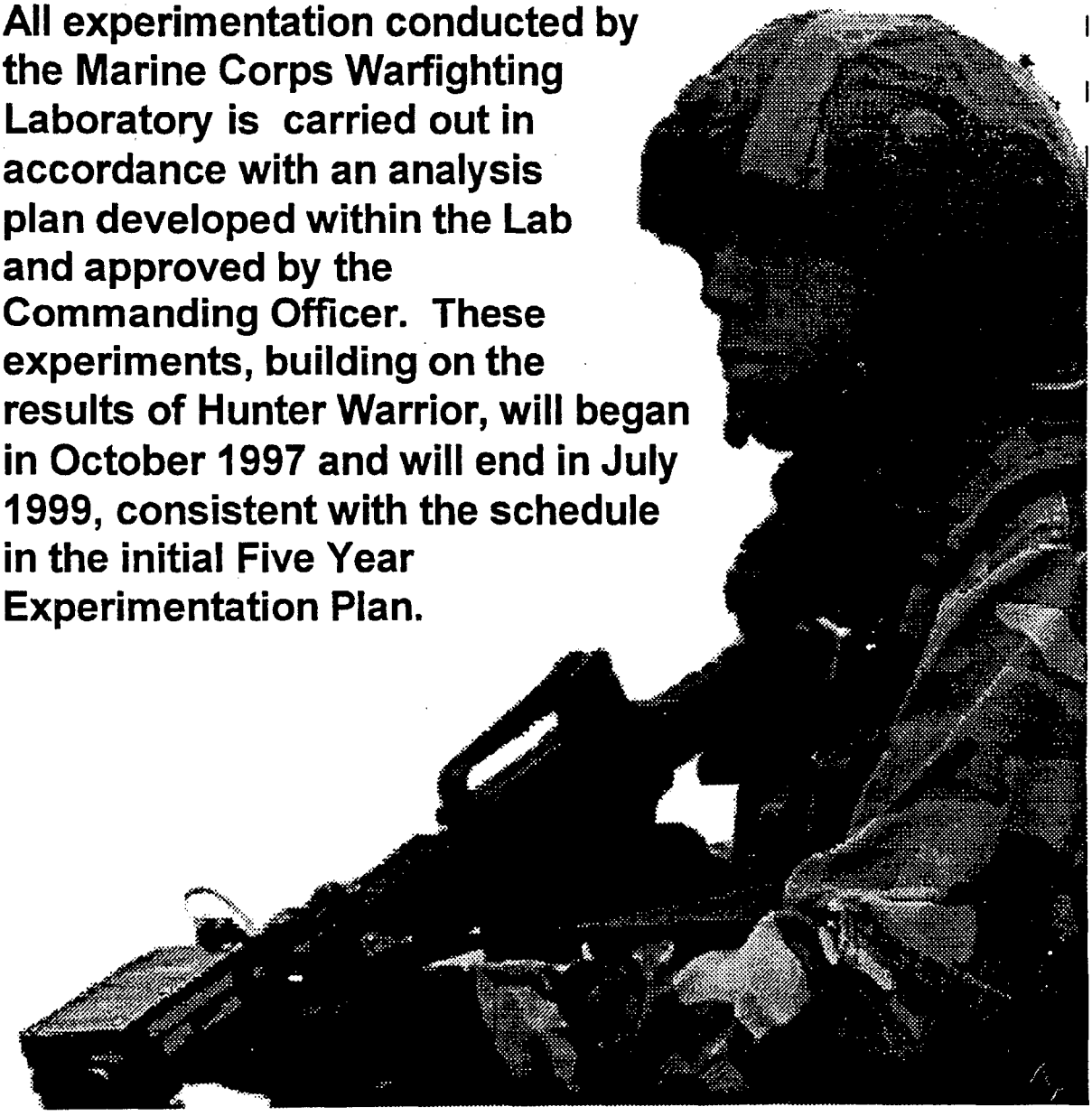
INTRODUCTION

This document provides the conceptual basis for the Urban Warrior phase of experimentation. All experimentation conducted by the Marine Corps Warfighting Laboratory is carried out in accordance with an analysis plan developed within the Lab and approved by the Commanding Officer. These experiments, building on the results of Hunter Warrior, will began in October 1997 and will end in July 1999, consistent with the schedule in the initial Five Year Experimentation Plan.



The Five-Year Experimentation Plan

The current Five Year Experimentation Plan (FYEP) is the cornerstone document for Marine Corps experimentation. It consists of three phases of experiments comprising the Warrior series.

The initial ***Hunter Warrior*** phase of experiments, completed in the spring of 1997, explored extended, dispersed battlespace concepts. It investigated the contribution that an afloat, Marine Air-Ground Task Force (MAGTF) — enhanced with selected conceptual and technological improvements — could make at the operational level of war. Utilizing enhanced targeting, precision fires, C4I improvements and a limited deep operational maneuver capability, this force was able to shape the battlefield beyond current force employment options. Although intended as a proof-of-concept experiment employing a Special Purpose MAGTF, the results of the experiment were intended to have application in Marine Expeditionary Force-level operations as well.

Building on *Hunter Warrior*, the *Urban Warrior* experiments will investigate a range of further enhancements aimed at ensuring that

"Could we significantly extend the area of influence of a modest forward afloat expeditionary force, and also significantly increase its effectiveness within that expanded area of influence?"

A squad leader directs his Marines during the Hunter Warrior Advanced Warfighting Experiment in March 1997.

forward afloat forces can effectively *cap* a crisis in urban environments. Said another way, *Hunter Warrior* identified enhancements needed now for the current operating forces. *Urban Warrior* will continue the process to create a Corps positioned to meet the challenges of an uncertain future. It will lead into *Capable Warrior*, the last phase of the Five Year Experimentation Plan. A second Five Year Experimentation Plan currently under development is tentatively scheduled to include *Information Warrior, Coalition Warrior*, and *Future Warrior*.

The *Warrior* experiments involve many agencies. Reflecting the naval nature of the forces, the experiments are closely coordinated with ongoing U.S. Navy Fleet Battle Experiments (FBE); the Military Operations in Urban Terrain Advanced Concept Technology Demonstration, co-managed with the US Army; the Extended Littoral Battlespace (ELB) ACTD; the Department of Navy Chemical and Biological Incident Response Force (CBIRF).

Other organizations involve include: DARPA's Small Unit Operations (SUO ACTD); Office of Naval Research sponsored-expeditionary warfare initiatives; Joint Counter Mines ACTD; National

Security Agency coordinated efforts to exploit commercial off-the-shelf (COTS) encryption and related C4I advances; and National Reconnaissance Office initiatives to exploit national assets.

Marine Corps-led non-lethal capabilities development and various Lab projects in concert with the National Institute for Urban Search and Rescue (NIUSAR) will also add to the range of experimentation.

Experimentation results will be evaluated within the Combat Development Process (CDP) at MCCDC for their potential. CDP actions and recommendations will be translated into new doctrine, organizations, training, equipment, and support (DOTES). In addition, our allies will be kept informed of the results of experimentation and, where possible, involved in the experiment developmental effort. To this end, officers from the Royal Navy, Royal Marines, Australian Army, French Marines and Dutch Marines have either joined the Lab staff or are actively participating in the experiments or supporting training.

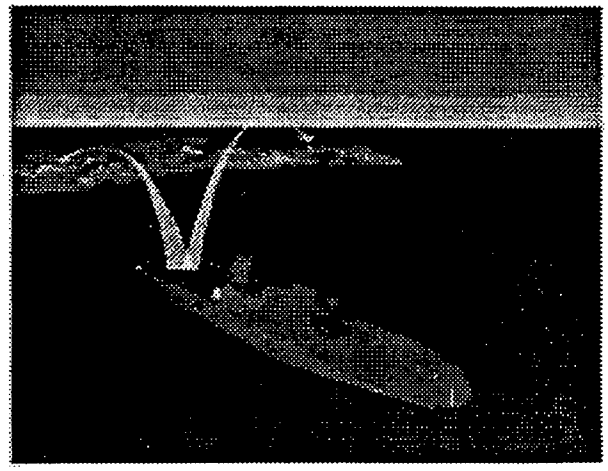
Naval Expeditionary Operations on the Urban Littoral

Naval expeditionary forces have historically carried out urban contigency operations. Since 1945, there have been more than 250 naval interventions and 90 percent have involved cities.

Demographic trends make it a near certainty that future operations will involve more of the same. Population models estimate that 70 percent of the world's population will live in cities by 2025. Seventy percent of these cities will be located on the world's littorals.

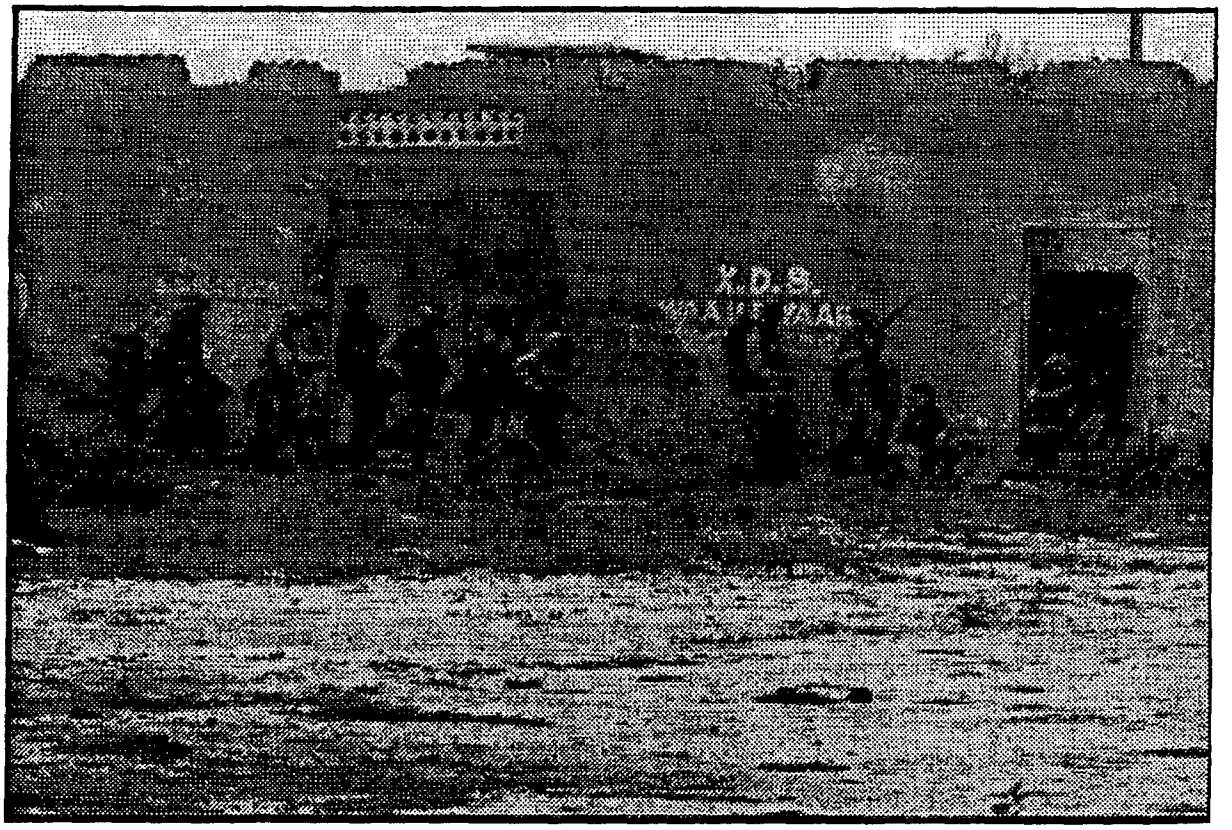
Like other expeditionary operations, urban operations will be characterized by the application of operational maneuver from the sea (OMFTS) — and its supporting concept of ship-to-objective maneuver (STOM) — enabled by new concepts and technologies. These operations will be executed on the littoral battlefield that includes the extended naval battlefield (with its landward and seaward urban approaches) and the constrained (urban) battlefield.

Exploiting the sea as maneuver space, naval expeditionary forces will be prepared to execute a wide range of contingency operations without establishment of, or dependence on, facilities ashore. Viewing the urban littoral as a single naval battlefield ashore and afloat, these naval expeditionary forces will employ a maneuverist approach to collapse cohesion, erode will, and/or attrit enemy capabilities to create a dilemma that adversaries cannot effectively deal with.



Building and maintaining supply dumps, depots and combat power ashore will be extremely difficult in many future conflicts. Urban operations in the future will be characterized by the application of Operational Maneuver from the Sea (OMFTS) and its supporting concept of Ship-to-Objective Maneuver (STOM).

As described in the *Naval Operational Concept*, both MAGTF and Fleet elements will comprise maneuver components within an integrated naval force. These forces will contribute to joint and/or combined objectives. Naval forces generate decisive force by using tailored combinations of MAGTF, fleet, and joint force capabilities through the integration of organic force projection capabilities, new technologies and new concepts of employment.



Naval Expeditionary Forces do not reduce cities. They penetrate urban areas to execute a discrete set of operations in the face of difficult conditions.

Potential changes in operating force capability, concepts, and organization, as well as in supporting establishment roles, have been identified for experimentation. Examples include employment of a cellular MAGTF command element, a new staff decision process, precise targeting and fires, new maneuver-based urban tactics, dispersed seabased sustainment (including unmanned vertical delivery of supplies), detailed urban database preparation and exploitation, robotics, seabased C4I, responsive sensor employment in the urban canyons and their approaches, widespread use of non-lethal technologies, and integrated operations involving naval forces in combination with new organizations such as the CBIRF.

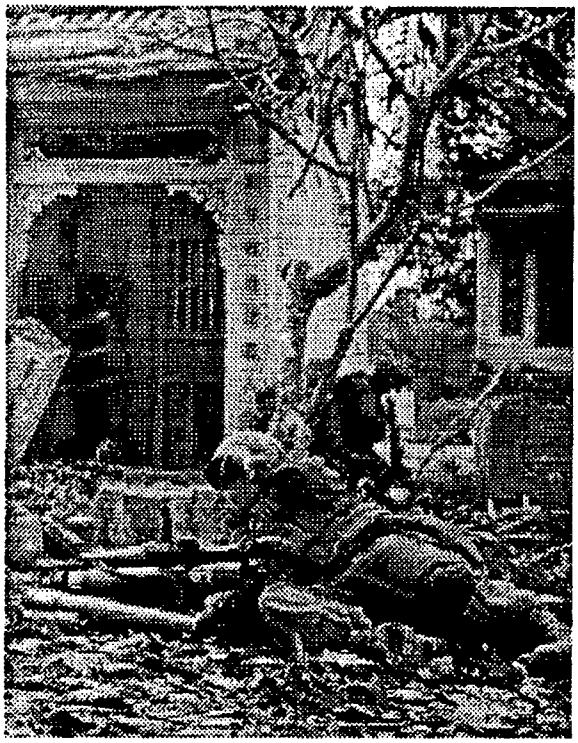
Naval expeditionary forces will normally be employed as elements of a JTF or as forward elements of a larger joint force executing short warning, contingency response. In general, naval expeditionary operations will be seabased and will be executed as operational maneuver from the sea. They will involve widely separated elements ashore and afloat and will require intensive intelligence and database support throughout. These operations will involve extensive use of information operations and be highly dependent on small unit initiative, an understanding of intent, and an aggressive opportunism at all levels. These operations may last only a few days or may consume months.

During this time the seabase will provide the basis for force projection and a base for air cushion and aviation mobility assets. The seabase will also provide an offshore safe haven for central C4I and sustainment capabilities and a significant share of integrated naval/joint sensor and fires capabilities.

In executing these urban littoral operations, naval expeditionary forces will not reduce cities. Instead, they will penetrate urban areas to execute a discrete set of operations in the face of difficult conditions. The mission, duration, and scope of these operations will normally be limited. However, these operations can run the gamut from intense combat to humanitarian operations.

The Constrained (Urban) Battlespace

The Marine Corps has an extensive history of operating in cities. Within the last 30 years, Marines have fought in areas as diverse as Hue City, Beirut, Khafji, Mogadishu, and even Los Angeles. Increasingly, it has become evident that Marines must have the capability to operate effectively in urban, near urban, and open areas.



Marines at the Citadel, a key point in the 1968 Battle of Hue during the Vietnam War. Hue was the last major urban battle Marines participated in. Photo courtesy of Don North.

Isolation of an urban area may well involve dispersed operations on an extended battlefield (a la *Hunter Warrior*). Operations within the dense urban area are likely to be focused on widely separated enemy strong points and key facilities — such as communications complexes and selected avenues of approach and egress. Operations at sea must be designed to support both of these applications simultaneously.

Operations in cities and on their approaches will involve maneuver and close range engagement in an environment characterized by concentrated cover, concealment and obstacles. Accordingly, urban terrain favors the defender. In this constrained battlespace, units will maneuver on four planes: (1) in the subterranean plane using the sewers and subways, (2) on the surface plane using the floors of the urban canyons, (3) within the structural plane from building to building, and (4) in the air above the city.

The urban infrastructure can be both ally and enemy. While providing cover, concealment and significant sustainment potential for the MAGTF, it is also a formidable adversary. Urban environments limit large-scale use of indirect fires. Structure densities and interrupted lines of sight vastly complicate communications and targeting. Building densities also require precise small unit location capabilities within a three dimensional puzzle. Concrete and other materials contribute to spalding, ricochets and fragment wounds. Structural density, electronic interference and industrial obscuration reduce the utility of joint, overhead sensing systems.

At the same time, the squalor and highly inflammable nature of building materials within many Third World urban areas — coupled with the wide use of propane or natural gas for heating and services — creates a risk of catastrophic fire.

Compounding the problem for Marine forces in the urban battlespace is the risk that dense urban terrain can consume Marines in *clearing and holding*, physically and tactically exhausting both individuals and units. Accordingly, in some cases *exhaustion* — or its prevention — may be one of the critical vulnerabilities worthy of consideration in a maneuverist approach to this complex battlefield.

The wide range of possible scenarios demands that MAGTFs be prepared to execute limited objective operations in neutral, friendly and

hostile areas. Isolation operations may be required on key terrain and specific avenues of approach to or egress from cities. Urban penetration operations will introduce forces to seize and control key facilities or to selectively destroy targeted armed forces. Supporting operations designed to collapse essential functions will accompany or precede the main effort. Often, operations will be designed specifically to influence and assist non-combatants. Additionally, chemical-biological consequence management operations may be mounted in response to the use of weapons of mass destruction in urban areas.

Urban operations will feature many different missions and Marines must possess humanitarian skills as well as warfighting skills.

Because it supports asymmetric operations, the urban battlespace offers a special attraction to non-state fighters, terrorists, and guerrillas. As discussed earlier, urban characteristics can blunt the effectiveness of many current military technologies and it offers ready-made media and public exposure to potential foes. It provides a broad stage for the use of weapons of mass destruction (WMD). In fact, the only question seems to be *when* – not if – we will need to employ CBIRF and related chemical-biological response capabilities on the urban littoral.

The ability to respond to the chemical and biological weapons of mass destruction is a necessity for Marines operating on the future urban littoral.

Finally, the urban environment affords an enemy the ability to *blend* into the non-combatant population, presenting special challenges to operating forces.

Noncombatants and refugees may be as formidable a factor as the urban infrastructure. Refugees are likely to clog roads, inland waterways, airfields and ports as well as presenting commanders with humanitarian support issues. The presence of large numbers of people who are nominally *not involved* in the conflict becomes a significant factor which shapes rules of engagement, small unit leader decisions, weapons applications, information operations, sustainment planning and *end state* definition. In fact, a means to attain mission accomplishment may be the successful winning of non-combatants' *hearts and minds.* Accordingly, urban operations planning must consider actions to deal with the support of indigenous non-combatants. Plans must include policies for dealing with the variety of humanitarian issues of non-combatants in a combat zone to include the potentially overwhelming responsibility that could be assumed by the U.S. military forces for food, water, shelter, medical care

Successfully dealing with non-combatants — the winning of hearts and minds — will play an important role in urban operations.

and utilities for the inhabitants of an urban area as a result of military operations.

In addition, actions will be planned and executed to take full advantage of non-lethal technologies and the potential offered by information operations. Non-lethal technologies will be employed at close range — and potentially from over-the-horizon by aerial delivery. They will be used for denial and blocking missions, crowd control, access limitation tasks and economy of force missions to free forces for elsewhere.

Experimental Tactical Concepts

Urban terrain offsets many of the strengths in the traditional American way of war. The effectiveness of satellites and reconnaissance assets are severely reduced in the dense clutter and density of the terrain. Firepower inflicts collateral civilian casualties and crumbles the infrastructure. The rubble in turn prevents rapid maneuver and affords the defender increased protection.

Messy, entangled and chaotic, urban warfare is the opposite of the long range precision weapon engagements that characterized Desert Storm. In city streets, engagement distances are generally short and identification of friend from foe and non-combatant is inherently difficult. Although the combined arms approach remains central, the emphasis clearly is on the infantry small unit leader who must be given the tools to replace combat characterized by attrition and perseverance with maneuver and improvisation.

In the past, there were no technological tools to assist the primary battle leaders — squad and platoon leaders — in maintaining situational awareness. In the future, however it may be possible for every Marine to have radio commu-

Marines patrol through a crowded alleyway in Mogadishu, Somalia in 1993. Devising new methods to meet urban challenges is the purpose of the Lab's experimental tactical concepts.

nications, to know precisely where each Marine is at all times, to be able to track all other Marines in his area of interest and to receive minute-to-minute updates on the location of enemy positions and such key information as zones of grazing fire. As a result, units of varying sizes can be tailored to the situation and dispatched simultaneously to different locations, with their actions coordinated as necessary through a concept of an *on-scene tactical commander* — all operating within the intent and understanding of the overall MAGTF Commander.

This concept of command and control differs greatly from the current system of command and control that is pyramid-based. Currently, the C2 concept is that each level reports to the next higher level — squad to platoon, platoon to company — and in turn receives instructions on what to do. While *commander's intent* means that subordinate leaders do have degrees of freedom to exercise initiative, they are still subordinate. In heavy contact they are expected to report and to receive instructions from the next higher command, which is also the pathway to reinforcements and supporting arms. The next higher level makes the decisions about additional resources. In addition, higher command offers more experience, a valuable commodity on the battlefield. Small units today have strong incentives to stay tucked inside the close control of higher headquarters.

Accordingly, it is not enough to experiment with technologies which permit a different approach to urban combat. Instead, experimentation must address both tactical decision making and the impact of improved communications and information on urban tactics.

The squad is the basic maneuver element in the urban jungle. *In fact, the squad leader will become the lowest level battle leader capable of independent operations on the constrained urban battlefield.* In the tactics envisioned for experimentation during *Urban Warrior,* the emphasis will be on the squad leader as the tactical decision maker. He will make the decisions to request and then direct reinforcements or supporting arms.

As a tactical decision maker, the squad leader must be more than simply a tactical employer of his squad. As in the case of platoon and company commanders, these experimental tactics emphasize the opportunism of tactical commanders operating independently and using technology to coordinate with other forces and supporting arms as necessary.

The major difference between these tactics and current tactics is in command and control. The commander at the point of contact — whether at squad, platoon, or company level — assumes the role as *on-scene tactical commander* until relieved. He becomes the supported commander with higher level or reinforcing adjacent unit leaders acting in support of the on-scene tactical commander. If additional ground forces are needed, the on-scene tactical commander requests them and if dispatched then he assumes tactical direction of their employment. A squad leader calling for assistance could conceivably use his palm-top computer to provide an overlay to reinforcing squads to direct their tactical scheme of maneuver. If the fight expands and a lieutenant or captain arrives on-scene, the senior officer could assume command once fully acquainted with the tactical situation and able to assume tactical control

Implementing this concept requires self-confident, experienced squad leaders. This means squad leaders who are both tactically proficient and capable of the tactical decision making normally associated with school-trained officer platoon commanders. FMFM 6-1, *Command & Control*, stresses that such decentralized decision making is a basic requirement for accelerating battle tempo and operating inside the enemy's decision making loop.

Implementation will require small unit leaders that are not only tactically proficient, but also products of a different training program that builds self-confidence in tactical decision making skills. Squad leaders should be expected to effectively assume the role of on-scene tactical commanders rather than to report and await orders when faced with the unexpected or the need for external support.

The Marine Corps Warfighting Lab's approach to urban warfare is to experiment with tactics and technologies which encourage small unit confidence and decision making. On-scene tactical command of simultaneous non-contiguous engagements is the conceptual means to escape the trap of a linear attrition approach to urban combat. What pulls together the threads of this approach is a change in the locus of decision making, a downward shift, implicit in Marine Corps doctrinal publications but not yet achieved generally in practice. The degree of centralized or decentralized command and control should be on a sliding scale dependent on the combat situation. Improved tactical skills and decision making at the squad leader — when coupled with improved communications and access to information — are intended to increase the flexibility of the commander to choose to operate using dispersed tactics and simultaneously attack the enemy at several key points, thus accelerating battle tempo beyond the ability of any opposing force to cope.

"To give cohesive squads skilled leaders"

To impart skills to a squad leader to enable him to be a:

- **Leader**
- **Decision maker**
- **Tactician**
- **Trainer**

A review of urban warfare history reveals four common features. First, with few exceptions, forces attacking cities surround and isolate the target city, then conduct a linear, methodical sweep of the city to clear it of enemy forces. Second, this linear sweep of the city usually results in numerous casualties — enemy, friendly and noncombatant. Third, there is an extremely high consumption rate for small arms ammunition and grenades. Fourth, combat in urban environments is extremely exhaustive, both physically and mentally.

Several new tactical concepts are under development as a basis for exploring dispersed tactics in the urban battle. *Naval advanced force battlespace shaping operations* focuses on identification of pre-operational preparation — particularly in reconnaissance, surveillance, targeting, and the establishment of selected support capabilities to prepare for future expeditionary operations. *Urban penetration* and *urban thrust* are designed primarily for use in mid-intensity conflict while *urban swarm* may have greater applicability in lower intensity conflicts. (This should not be construed as prohibiting their use as appropriate.) *However, continuous attack* is a supporting concept. All of these concepts are based on the precepts of maneuver warfare, and seek to explore the potential utility of dispersed, non-linear operations. *Active urban defense* describes efforts to apply the concept of maneuver warfare and coordinated dispersed operations to defensive tactics in the urban environment.

Note: the offensive tactical concepts developed below do not constitute the totality of potential options. Another construct proposed for consideration is an adaptation of the Finnish Motti tactics in which the urban area is subdivided (and potentially isolated into zones by the use of non-lethal obstacles) and the opposing forces destroyed in turn in those zones of interest to the MAGTF commander.

Naval Advance Force Battlespace Shaping Operations

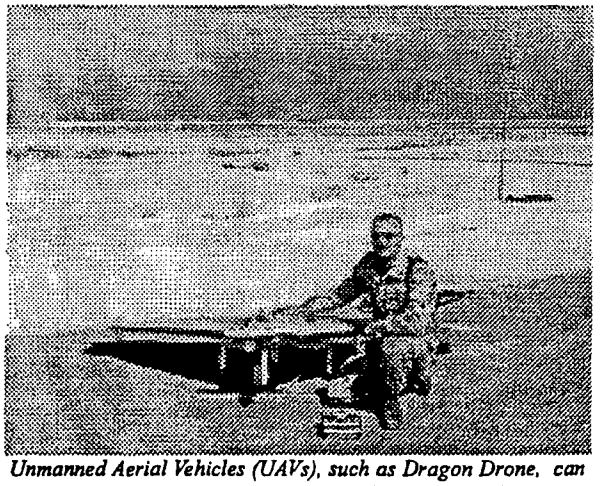
The concept of *naval advance force battlespace shaping operations* is designed to focus efforts on preparing a littoral area of interest for future tactical operations. In its initial stage the concept focuses primarily on collecting and cataloging critical elements of information into data bases immediately available to the naval task force and embarked MAGTF.

Central to the development of databases is the concept of reach-back from the forward naval task force to intelligence and support agencies within the United States or to our allies within theater as applicable. These external agencies should not only provide access to all known intelligence products concerning the area of interest, but also assist in cataloging the vast amounts of unclassified information concerning the area, its infrastructure, and its inhabitants.

The growing world urbanization makes up-to-date information — to include infrastructure information concerning road systems, bridges, underground systems, building blueprints, energy grids, communication systems, current aerial photographs and maps — especially important. The key to effective reach-back is the rapid and efficient cataloging of information products for the direct use of forward forces in their planning and tactical operations.

A second category of advance force battlespace shaping actions is the employment of national and theater sensors to develop understanding of the future operating area with a focus specifically on key areas of information. Where possible, direct download of sensor products is desirable — and must be established and practiced as a priority during advance force battleshaping actions. When direct access is not possible, identification of precise products that could be available from intelligence agencies as a result of national assets must be identified and the products requested.

Using reach-back capabilities to build urban-specific databases is the first step in advance force operations. Reach-back resources, available through secure World Wide Web sites, offers the ability to coordinate intelligence resources and gather unclassified information concerning the area of operation.



Unmanned Aerial Vehicles (UAVs), such as Dragon Drone, can be operated at the MEU-level and will improve information collection for advance force operations.

A third category of actions is the expansion of information coverage through the use of organic information collection assets to include manned aircraft, UAVs, UUVs, submarines, reconnaissance and special operations forces. In some cases, it may be possible to introduce forces into the region — either openly or covertly — to coordinate with country teams or friendly militaries within the region.

Coordinating or developing logistical support for future operations may be a significant concern of the initial insertions of personnel and forces into a future operating area. Arranging for logistical support may take the form of host nation coordination, contracting for specific services, or the development of clandestine caches of equipment and supplies needed to support the future employment of combat forces operating on an extended littoral battlefield in non-contiguous, dispersed units.

Should the advance force be operating in the role of forward presence force prior to the outbreak of hostility, they may also be playing a key role in the shaping of political and military perceptions within the region. In these cases, battlefield shaping operations may take the form of exercises and demonstrations of military effectiveness to serve as both a deterrent and stabilizing force within a volatile region — or as a demonstration of US political commitment to embattled allies or friendly states.

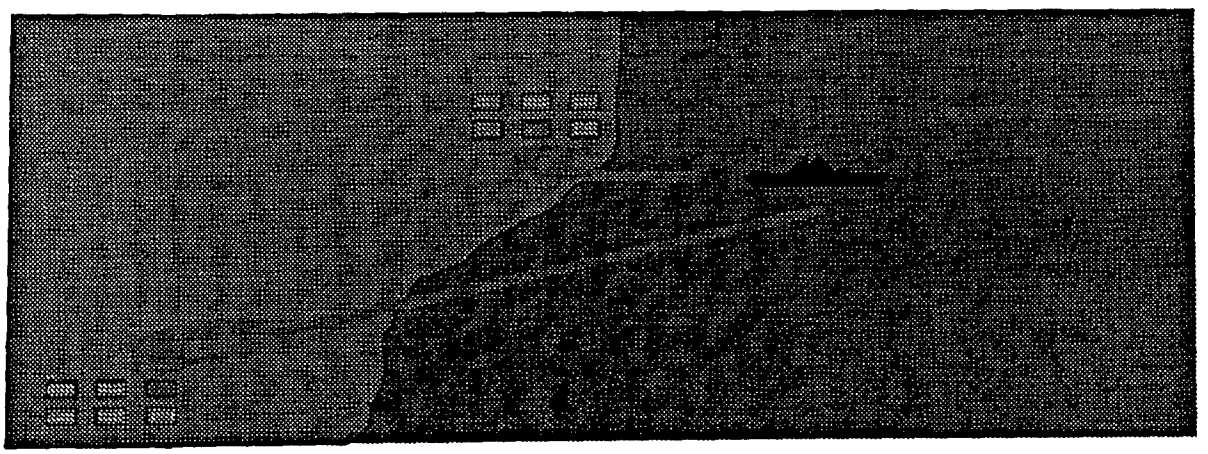
Urban Penetration

The urban penetration tactic is designed for operations against clearly defined objectives, either enemy or terrain. Although at first glance focusing on terrain may seem to contradict maneuver warfare, there are exceptions to every rule.

The urban battle has several factors which the open battlefield usually does not. The most notable of these is the presence of large numbers of non-combatants. Second, is the presence of man-made features — power plants, water plants, food storage and distribution centers — which may provide leverage in establishing control over the

Urban Penetration

- Seeks to exploit urban characteristics
- Precise attack to seize specific objective
- Raid without retrograde
- Withdrawal could be to a second objective



Urban penetration focuses on clearly defined objectives, either enemy or terrain.

urban environment. The ability to rapidly seize these facilities and establish control over them may be critical to operations in an urban environment.

The urban penetration tactic is designed to quickly maneuver to the objective area and establish control in a dispersed and non-contiguous battlefield. Urban penetration requires sufficient mobility to move quickly to the objective area, seize it and isolate and protect it from the enemy and non-combatants. Movement to the objective area can be either surface, subsurface, or above the surface. The unit must possess sufficient firepower and protection to arrive at the objective area in sufficient force to seize the objective and establish control. Stealth will often be the preferred movement tactic in order to maximize force protection and surprise.

In penetration, the attacking force must have the ability to both seize and defend the objective area.

Upon arrival at the objective area, the penetrating force must move directly into the attack and seize the objective area. This implies movement in combat formations. After seizing the objective area, the attacking force must move to isolate and defend the objective. Forces conducting the urban penetration must have the necessary combat skills to allow them to conduct an opposed movement to the objective area, an assault of the objective and an immediate defense. This must be done in a maneuver context which permits maximum flexibility and initiative while supporting the commander's concept and intent. Attacks will likely be conducted on multiple axes of advance by dispersed units, as well as on several dimensions (subsurface, surface, structural, or above the structures).

Isolation, and/or defense of the objective, must include provisions for hostile forces as well as non-combatants. This implies a potential utilization of lethal as well as non-lethal weapon systems. The defending force must be sufficiently robust to accomplish its assigned mission. However, as with attacking forces in *Hunter Warrior*, defenders should be sufficiently trained and equipped to leverage the firepower inherent in the MAGTF, such as supporting tactical aviation and a naval surface fire support.

In conducting a penetration attack on an enemy force, the commander may choose to withdraw once the objective has been achieved. In this case, the penetration will take on many of the characteristics of a raid and should be executed accordingly. However, the withdrawal could take the form of a successive penetration to a second objective.

Note: based on historical precedent, the need for a thorough exploration of tactics, techniques and procedures for the relief or extrication of a penetrating unit must be addressed as part of the tactical assessment.

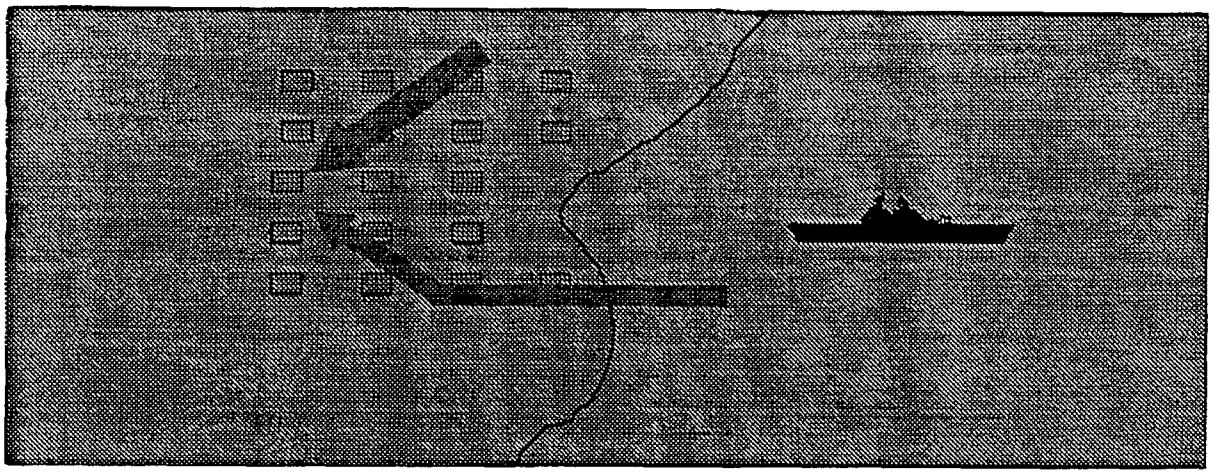
Urban Thrust

The urban thrust is a tactical concept focused on achieving an assault against the enemy on a narrow axis of advance. The thrust maximizes combat power at the point of the attack. It can be described as an arrow or dagger thrust into the enemy defense. As this narrow attack is occurring the axis of advance is defended in order to refuse the flank to enemy attacks. Potentially, this can be accomplished through a combination of forces, sensors and lethal/non-lethal barriers.

The urban thrust can be conducted on multiple axes simultaneously. These attacks should be conducted in parallel and be mutually supporting. When possible, the thrust should be conducted on an oblique axis to the street, which should help reduce

Urban Thrust

- Narrow Assault
- Axis of advance defended by forces, sensors, or ?
- Conducted oblique to streets using "Mouse Holes" for hiding access
- Shifting axis of attack
- Multiple axis of attack



Urban thrust envisions attacking the enemy along a narrow frontage with combat power maximized at the point of attack. The axis of advance in this narrow attack must be defended to refuse the flank. Potentially, this can be accomplished through a combination of forces, sensors and lethal/non-lethal barriers.

exposure in what has been the primary killing zone in urban combat. However, this tactic results in the need to breach buildings at their strongest structural point.

As the thrust proceeds, commanders conduct periodic shifts in the axis of attack in order to confuse the enemy and avoid establishing a pattern. This implies the ability to coordinate within the urban environment and establishes a requirement for coordination based on location and timing, and/or communications and location. As with all maneuver, knowing the commanders concept and intent are of paramount importance down to the fireteam/squad level is essential.

The thrust, conducted on multiple axes, presents the commander with numerous options. Thrusts can be made to a certain point, whence the commander can order one thrust to serve an anvil, while a second thrust acts as the hammer. Thrusts can also be directed that have one line remain stationary while a second thrust line conducts a right or left turn to complete an encirclement.

A variation is the use of a *weave* style that would move on narrow directions of attack through the infrastructure (conserving forces, rotating units to maintain relative freshness) then start on a new direction resulting in isolation of the enemy into pockets for destruction. During the employment of this tactical concept, enemy forces not directly engaged would be subjected to indirect fires, raids, probes and feints intended to reduce morale, cohesion and unity, thus limiting the enemy's ability to regain the initiative. The intent is to concentrate forces at the

time and location of the commander's choosing to achieve decisive operational results (such as the destruction of the enemy forces, the withdrawal of opposing forces, or the occupation of significant infrastructure within the city).

The options are many and varied. The concept's intent is to avoid the linear assault, while confusing the enemy, forcing his flanks, isolating his forces and deceiving him as to the true nature of the attack. Ideally, this will force his withdrawal and exposure without the necessity of a room-by-room clearing of the city. If forced to withdraw, the resulting exposure can be exploited by tactical aviation and indirect firepower cued by a combination of overhead national reconnaissance, surveillance, targeting architecture and tactical sensor systems. Refusal of the opposing force to withdraw can be countered by isolation and his reduction or elimination by siege.

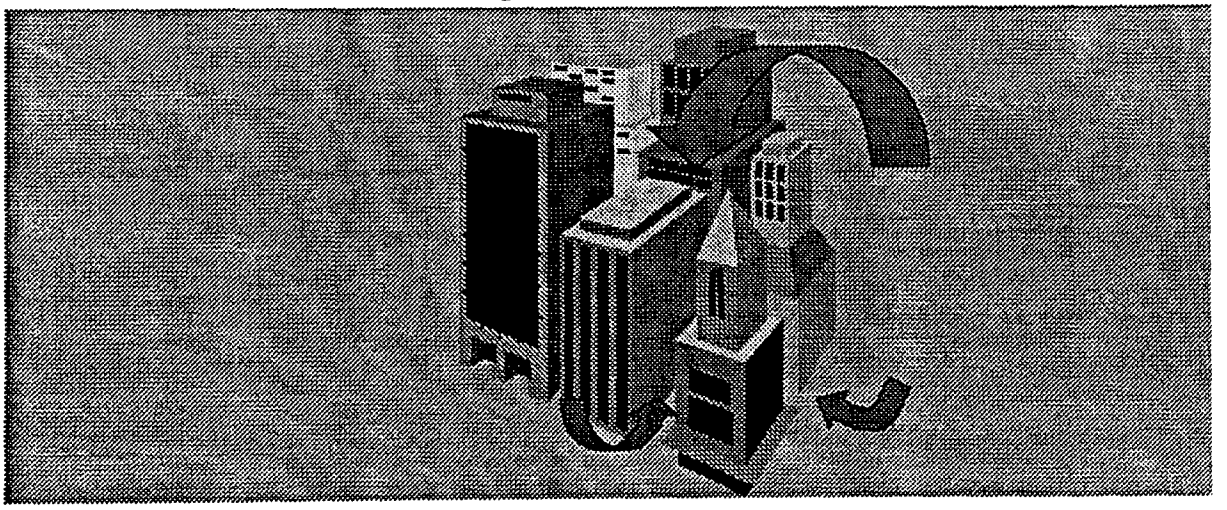
Urban Swarm

Urban swarm is similar to the tactic used by police responding to an emergency which requires backup. The tactical concept envisions numerous fireteams or squad-sized units operating in a dispersed, non-contiguous fashion in the urban environment. As these units patrol their assigned area, they must be continuously prepared to respond rapidly to calls for assistance by neighboring teams. Whether they can respond to a call for assistance will be dependent upon their own situation and distance from the supporting request.

As a call for assistance is transmitted, the requester should give an estimate of his requirements. This request would be transmitted to all other teams on the net and higher headquarters

Urban Swarm

- Low Intensity Conflict?
- A single incident or an area
- Command & Control
- Fire Support Coordination Measures
- Size of units responding



The urban swarm tactic is similar to the response police departments use in an "officer down" situation. The tactic envisions numerous squads patrolling within a city and responding, as directed, to a squad in contact.

— to include the seabased Experimental Combat Operations Center. The battlewatch captain would then direct the appropriate teams to respond to the request and adjust other units to fill or cover gaps that are created.

Alternative methods could include the teams closest responding without direction, while simply reporting their intention to respond. As situation awareness improves at all levels, where all units have the current location of all adjacent units in near-real time, coordinating this tactic of response without fratricide will increasingly become more feasible.

Command of teams responding to a request could also take several forms. The commander or leader of the unit requesting support, as the one with the best awareness of the situation, could assume command of responding units as the *On Scene Tactical Commander*. Other options could include the senior commander within the immediate area of operations assuming command, or in some instances, a command element being sent to the scene by the battlewatch captain.

Another option for command in a crisis is to have units conduct the swarm tactic as a version of the platoon patrol base. In this case, the platoon commander and platoon sergeant would be in the vicinity of the platoon patrols and these personnel would be on scene in case of emergency. This process could be carried up to the company and battalion levels with appropriate levels of command available to meet the situation. What must be avoided, however, is *over commanding*.

The key to this tactic is speed and flexibility. The requesting leader must be able to quickly and concisely inform the responding units of the situation and maneuvering them to advantage as they arrive on the scene. The responding units must also have the flexibility and training to enter an emerging situation seamlessly. Implicit in this concept is the capability of junior leaders to assume increased levels of responsibility and command. The tactic also requires the ECOC to be able to respond to the crises and to adjust forces in the gaps that are created.

What must be avoided at all costs is establishing patterns. If units respond to crises in redundant or similar patterns, the enemy will quickly observe this and easily create crises in order to lure responding units into ambushes or exploit the temporary void created on the battlefield by responding units.

Continuous Attack

Many factors can lead to success or failure on the battlefield. Among these are physical and mental fatigue. The rigors of combat – carrying heavy loads, running, loss of sleep, climbing, digging – coupled with the mental stresses of fear, rage and exhilaration, can in a short period of time reduce physical and mental capabilities in individuals and units.

This fatigue can lead to failure on the battlefield. Military organizations that can exploit fatigue, however, may gain significant advantages. The unit that is effectively conducting continuous operations can place significant physical and mental stress on an opposing force and render them unfit for combat.

The theory of continuous attack is simple, but the execution is difficult. In short, continuous attack is around-the-clock offensive combat. The attack is gained and maintained until the enemy is defeated.

To conduct continuous attack, a unit must organize for sustained and surge operations. At any given time, a percentage of the force is in the attack applying unrelenting pressure on the

Continuous attack is predicated on gaining and maintaining momentum in order to wear an enemy out.

enemy. To maintain the attack and hence the pressure, units in contact will require rotation at specified intervals. Units rotated from the attack must then go into a rest, recovery and maintenance cycle before again being rotated into the attack. Units not in the attack cannot be used for other operations or details. They must gain the required rest in order to be placed back into the attack fresh. A variation of *aviation crew rest* principles may be the answer.

The one exception to the above is surge operations. As the battle unfolds, the commander must continually analyze the situation and gauge the combat effectiveness of his opponent. Indicators must guage an enemy's physical and mental capacity. Ideally, a surge effort will be focused in a culminating offensive stroke that is unleashed when the enemy is at his weakest.

Developing the capability to conduct continuous attack will require a major shift from the current practices. Although most commanders attempt to conduct 24 hour operations, ground operations are usuallylimited to 12-16 hour stretches, with rest periods between efforts. Further, main attacks are typically "weighted" and a minium reserve force primarily for exploitation of success is maintained.

To successfully conduct continuous attack, units must be prepared to rotate forces in the attack. The percentage of the force employed at any one time may vary significantly. As a general rule, no more than 60 percent of a force should be committed to continuous attack at any given time. Whatever the split, the emphasis must be on maintaining continuous pressure on the enemy. While resting forces to continue the attack, the intent is that the enemy force is denied the opportunity to rest or reorganize due to the need to defend against our unrelenting pressure.

Technology may contribute to the conduct of continuous attack. The use of sensors, both close in (squad level) and extended, can enhance force protection efforts and reduce readiness levels of units in rest periods. In the same fashion, the use of autonomous fire support systems such as the Dragon Fire 120mm mortar can reduce the footprint ashore by eliminating the need to man and defend fire support positions, increase the supporting fires options for commanders during maneuver, and reduce the footprint of non-maneuvering forces ashore.

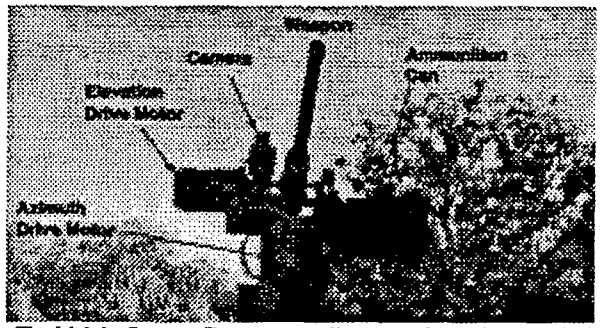
Adoption of continuous attack as a tactical imperative will require a fundamental shift in tactics and training. It will require unit and individual training to emphasize relief in place of engaged units and covert withdrawals. Professional schools will need to emphasize operational planning that utilizes only a portion of the force at any given time, and indicators of enemy readiness and mental condition, to identify when to most effectively seek decisive engagement.

Active Urban Defense

An often used truism is that *the best defense is a good offense.* It is also true that the attacker — primarily because he normally has the initiative to engage where and when he chooses — generally will prevail over a static defense even though the defender has the advantage of fighting from protected positions. Once the defensive positions are penetrated by the attacking force, the defender is generally forced to withdraw to the next position. There are numerous reasons for the attacker prevailing, the most prevalent being that the defender dares not concentrate all his force in a single location for fear of destruction via indirect fires or isolation by the attacking force. The attacker by contrast can select his target or objective and concentrate the requisite force to achieve his goal.

However, there are times — even if only to pause and give rest to U.S. forces — that it is desirable for expeditionary forces to assume a defensive posture. The complexity of defending within the urban environment is compounded by the diversity of the terrain, the presence of non-combatants, the segregation of units due to structures, and the multi-dimensional aspect of the environment (surface, sub-surface, cross canyon, supra-surface). As in the attack, the conduct of the defense is more difficult in the urban environment than in more open terrain.

The *active urban defense* envisions combining the best attributes of both the defense and the



The Mobile Counter Fire System offers several capabilities which can enhance active urban defenses. Mutually supporting direct and indirect fire assets will be a major player in active urban defenses.

attack. In short, maximizing the advantages of each. Under this concept, the defender arrays his forces to cover the desired area and its approaches. Minimum force is deployed much in the manner of a screen — with mutually supporting fires from overwatch positions. These units are enabled with supporting fires, adjacent units and a reaction force to assist in the reinforcing critical points if required.

Fundamental to this concept is a shift in thinking that once a building or structure has been penetrated by the attacking force, the defender must begin to consider options for withdrawing to the next position. The defenders must, when attacked, immediately transition into the attack, thus making the defense more of a meeting engagement rather than a static defense. Further, just as in the swarm tactic concept, other adjacent units must be prepared to assist in the active defense by moving to assist the attacked location.

In preparing the defensive scheme, the defending unit must consider the location of *screening units*, which would then be linked to each other both electronically and physically through lines of communication. In essence, units would maintain overall situation awareness of the zone of operations and through prearranged support agreements and selected routes, move to assist each other in the active defense. Unit commanders will coordinate the assignment and movement of forces, as well as commit the reaction force as required to *on scene commanders* who will provide detailed coordination.

As an enemy force penetrates a structure, the defending unit would notify its higher commander, adjacent, and supporting forces — ideally by updating the common tactical picture. Simultaneously, the unit would go into the attack to repel the enemy force. Vice waiting for the attacking force in defensive positions, the defender should move to the attack while the opponent is attempting to consolidate at his entry point. The defender's advantage in local terrain familiarity and seizure of the initiative by attacking will ideally catch the opponent off balance.

As the on scene commander attacks, adjacent and higher commanders maintain situational awareness through the common tactical picture. By tracking events in the entire sector, all can conduct simultaneous preparation for responding to opportunities or threats ensuing from the on scene commander's attack. Should the local defender be unable to repel the attacker, adjacent and supporting units will be aware of the situation and can move into a counter attack of the position. As these units move to the attack, they should consider the flanks as their primary objectives. Again, as this is not the normal course of urban defense, it may serve to surprise the enemy, thus providing an advantage.

The *active urban defense* requires flexibility in planning and execution. It also requires commanders to be constantly assessing the opposing force to determine patterns of enemy movement and procedures. This is critical for the commander in determining when and where to commit additional forces or the reaction force in the defense.

In addition, the *active urban defense* can also be used to confuse the enemy as to the precise location of defensive lines, critical vulnerabilities, and obscure the defender's true concerns. Practiced properly, the *active urban defense* can contribute to the enemy dissipating his forces and energy at non-critical areas of the battlespace.

In short, the active urban defense is a merging of the tactics of a coordinated, dispersed attack and the defense. It is an application of maneuver warfare based on the commander's intent and not on defending specific terrain. In addition, it parallels the concept of the extended, dispersed battlefield concept in that the active urban defense is extended not by distance, but by conditions of terrain. This defense seeks to maximize the surprise of the attack, while at the same time maximizing the knowledge of and preparation of the defended terrain.

Experimental Tracks

Simultaneous with the exploration of new tactics, techniques and procedures (TTPs) for urban warfighting, the Lab will pursue six tracks aimed at systematically developing specific capabilities to further expand the operating concepts of Hunter Warrior and to extend the abilities of seabased forces in urban littoral operations.

Command, Control, Communications, Computers, and Intelligence (C4I)

The commander's ability to decisively maneuver within to accurately bring fires to bear, and to provide timely seabased logistical support depends on his ability to gather and process more battlespace information into knowledge than the opposing commander and to use that knowledge effectively.

Battlespace information becomes knowledge when it results in the cognitive recognition of patterns that lead to effective decision making. Knowledge does not require certainty. Instead, it stems from intuitive situational awareness based on interpretation of information.

Effective application of battlespace knowledge requires a flexible, integrated C4I system.

Communications

During *Urban Warrior*, command and control will be conducted employing a three-tiered communications system. Small-units operating at the tactical level from battalion and below will use inexpensive commercial off-the-shelf (COTS) systems — as well as current developmental systems and prototypes — that combine a small personal computer and communications terminal. These systems will employ commercial encryption to transmit to a system of fixed and mobile *repeater/collectors*. The dispersion of these collectors will insure robust communications and will also provide a defense against direction finders. Where practical, direct voice interface between small unit leaders and operational computer data bases using computer-voice recognition will be incorporated.

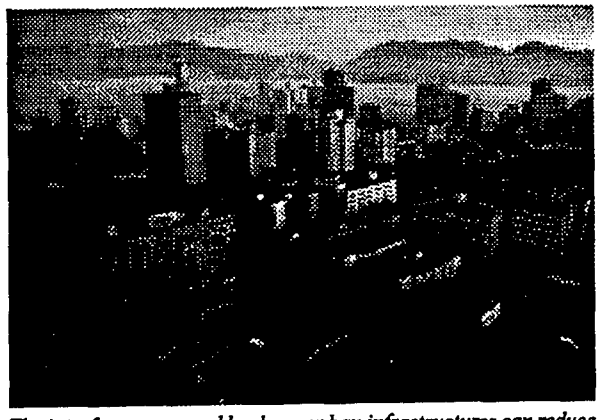
Artificial satellites will provide overhead relay stations connecting communication assets on the battlefield and at sea.

The mid-level tier from major subordinate elements to the MAGTF command element will employ less mobile, more sophisticated capabilities. A key attribute at this level will be the employment of video/visualization products and decision aids that require access to larger communication bandwidths.

A final tier of *purpose-built* assets configured to joint and combined needs will link the MAGTF to the naval task force, joint task force and other external units. Links will be digital, and enabled by employment of easily-launched artificial satellites providing line of sight transmission connecting the entire littoral battlefield, ashore and afloat.

The resulting C4I system that we are developing in *Urban Warrior* must have the following characteristics:

- is interoperable with key Navy and Joint systems.
- provides reliable multi-path information flows in the dense urban canyon as well as on the city's approaches.
- consists of a system of networks that will truly provide a bank of continuously updated circulating tactical and operational information that any unit can directly access.
- supports a common operating picture on the littoral battlefield in near real-time that provides location of friendly units and intelligence on enemy activity.
- supports a collective situational awareness in which one small unit can share its view of the local situation with a nearby unit, and can actually hand-off a target or even hand-off its tactical view seamlessly to another unit to grant local tactical advantage.
- supports a system that ensures all Marines will know where they are and where nearby units are at all times even in the dense urban environment.
- supports selected small units having the ability to employ local airborne sensors in the urban canyons and to share the resulting information in real time with other units.
- blunts the threat of enemy direction finding equipment targeting tactical communications to and from the squad and platoon end user terminals (EUTs) through a combination of systems protection and routing.
- supports two-way voice, data, and graphics flows from the ECOC afloat to all echelons down to squad-size elements ashore.
- provides a system that permits the users to employ all available fires, including aviation in both a centralized and decentralized fashion.
- employs a predictive (vice reactive) system that includes both decision support and advanced visualization for command and control.
- allows the MAGTF to co-opt and exploit existing telecommunications structures around the world. (In short, as cellular digital systems proliferate, prepare to *piggy-back* on them to support expeditionary operations.)



The interference caused by dense urban infrastructures can reduce the efficiency of even the most sophisticated communications systems. Developing a C4I network that can penetrate this environment is a necessity.

Experimental Combat Operations Center (ECOC)

The central MAGTF node for this integrated C4I capability will be the ECOC, usually operated at sea over the horizon, but alternatively moved ashore or located on board an aircraft. The ECOC supports a cellular command element organization designed to integrate rather than segment the battlefield into mediums or functions. However, it is imperative that the C2 environment needed by the MAGTF commander is available at any point of his choosing on the littoral battlefield.

Information management and communications systems hardware and software will operate transparently in the background to support computer assisted planning, execution, and decision making tools. The commander and his staff will use these tools to visualize, to monitor, to process the situation and exercise command and control.

Visualization will include real-time displays of friendly forces status, the latest information

The Experimental Combat Operations Center will take advantage of the visual nature of information in the 21st Century. The ECOC will also be able to integrate information from a variety of sensors, including Marines on the battlefield, and make computer-assisted planning and decision-making a reality.

on enemy force dispositions, capabilities and intentions, and environmental knowledge required to plan future operations, control fires, and maneuver forces (weather, tides, three-dimensional urban map displays).

Cellular Command Element

Among the most promising experimental initiatives in *Hunter Warrior* was a new command element design. Inspired by the Marine Air-Ground Task Force (MAGTF) Staff Training Program's work on the larger Marine Expeditionary Force command element, the Lab designed a command element model reflecting the actual functions that a smaller MAGTF would perform on an integrated and extended battlefield. Under this approach, the historical linear staff model (S-1, S-2, etc.) was reshaped with emphasis on removing stovepipes.

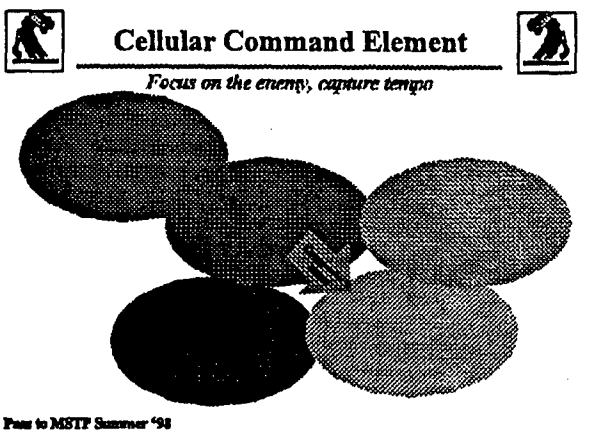
Consisting of cells modeled on battlefield functions, the experimental command element was organized to meet any requirement for mission planning and execution. It was structured to conduct required command and control, at sea or ashore, and was built around the functions of battlespace shaping and engagement coordination cells, supported by a robust combat information organization.

It operates in, and depends upon, a shared information environment to be fully effective. It is designed to exploit the associated real-time capabilities of the ECOC to improve planning, incorporate real-time sensor management, direct and coordinate the maneuver or air and ground units, coordinate fires, allocate bandwidth, and generate a much higher operational tempo and level of situation awareness than previous organizations.

Battlespace Shaping

The planning and future operations functions are performed by the battlespace shaping cell. It benefits from having the same real-time sensor feeds that the current operations/engagement coordination cell uses to fight the battle. Among the most significant functions of the battlefield shaping cells are:

- coordinating with higher headquarters on future operations.
- developing future information requirements
- coordinating concurrent planning of subordinate command elements.
- developing specific rules of engagement
- developing decision matrices and alternate branches and sequels.



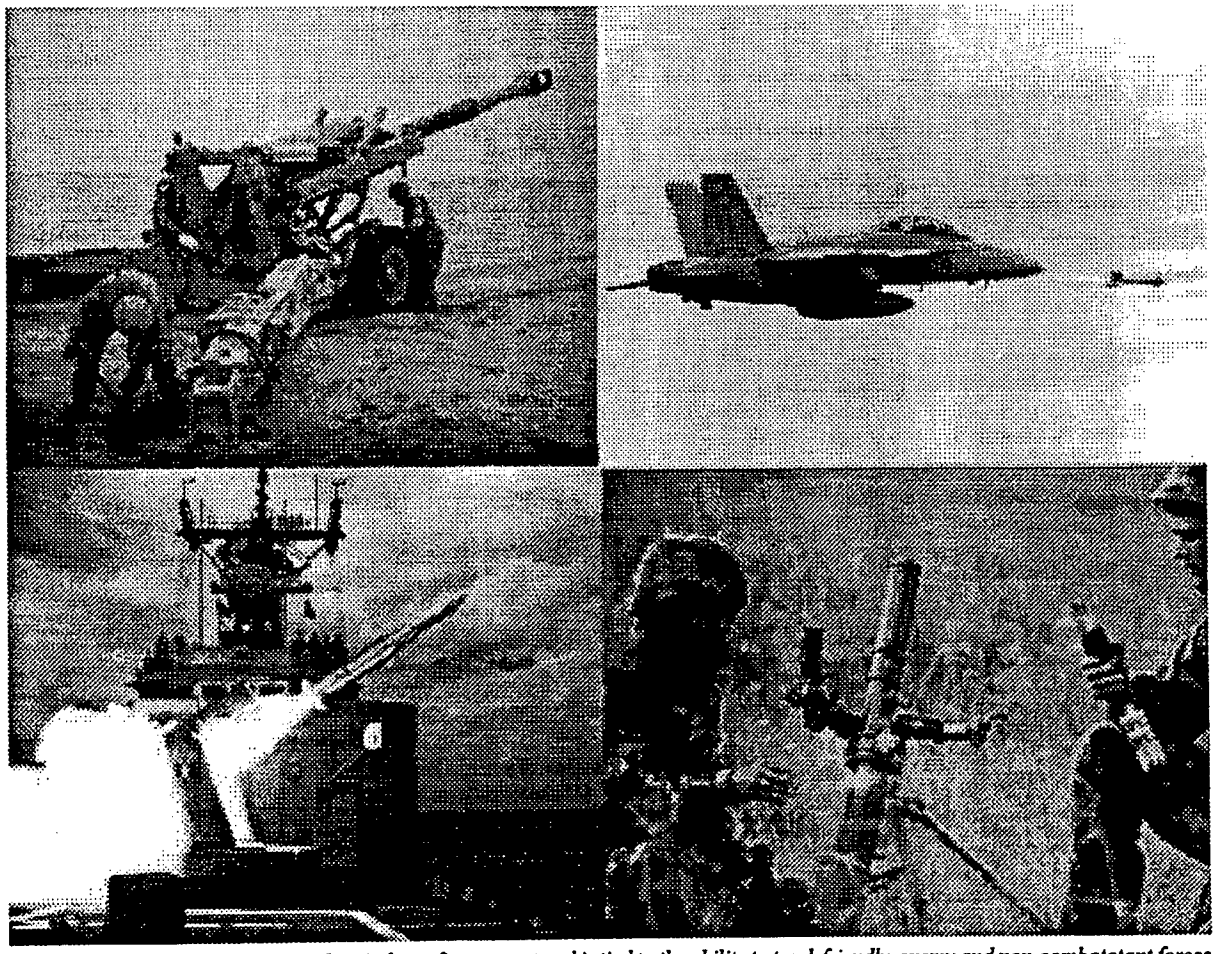
The cellular command element differs from the traditional, layered approach. Its organization was inspired by the Marine Air-Ground Task Force Staff Training Program's work on the larger Marine Expeditionary Force command element and focuses on the functions a MAGTF would perform on the integrated, extended battlefield.

A key function of the battlespace shaping cell is the coordination of reach-back staff functions for special skills and expanded products such as specific intelligence production or future target analysis. Developing a robust reach-back capability provides both augmentation and expansion of the forward MAGTF's cellular command element's effectiveness, particularly for afloat staffs where space and staff are a premium. Developing a network and establishing relationships with potential sources of reach-back expertise in anticipation of future requirements is a principal responsibility of the cell.

Engagement Coordination

Current operations are conducted within the cellular command element using the concept of engagement coordination. Engagements are executed not only through the use of coordinating indirect fires but also the systematic employment of information in maneuvering forces, sensors and the necessary bandwidth to support the command and control of the other three.

Precise and timely tracking of all friendly forces and known noncombatant locations throughout the battlespace is essential to effective engagement coordination. The boundaries and fire support coordination measures of previous systems will be replaced with buffer circles around friendly forces and noncombatants and these circles will move as those groups move. This will permit greater flexibility of target attack and will permit opportunistic target engagement — to specifically include attack by tactical aviation.



Engagement coordination is more than indirect fire support and is tied to the ability to track friendly, enemy and non-combatatant forces on the urban battlefield. Precision tracking of these forces may make linear fire support coordination measures obsolete. Buffer circles that move when friendly and non-combatant forces move will take their place and permit greater flexibility to attack targets.

To provide the needed responsiveness, the overall concept of fires coordination must take a new direction. Where past operations have had the focus of relatively static ground-based fires, future operations will require the preponderance of fires to come from sea-based platforms. Where fire support coordination previously concentrated on focusing fires on a main effort of ground forces, the new objective is providing efficient, immediate precision fires on critical targets over broad areas — often at long distances. This new paradigm is called engagement *coordination* and bridges the emphasis on fires to support maneuver to the use of tailored effects against enemy centers of gravity. Accordingly, engagement coordination centers afloat and ashore will have to be able to detect and prioritize targets, then allocate and direct fires of all types at the time and place required.

This *detect, decide, deliver* cycle is similar to past processes. However, it requires greater capacity to combine the intelligence/target acquisition resources to form a more comprehensive view of the enemy. At the same time, the inherent ability to correlate, coordinate, and de-conflict the combined fires of a naval-centered Joint Task Force must be retained. The engagement coordination systems of ECOCs — both ashore and afloat — must be fully compatible with all US military systems and must provide a clear and immediate picture of fires requirements as they are needed.

In addition to the deliberate targeting sequence, there must be a process by which Marines ashore can receive responsive fires. This means the MAGTF commander must have the ability to coordinate and direct both preplanned fires as well as fast-reaction direct attack fires through the same coordination system. The underlying principle is a system for the fastest and most appropriate fires on target, 24 hours a day.

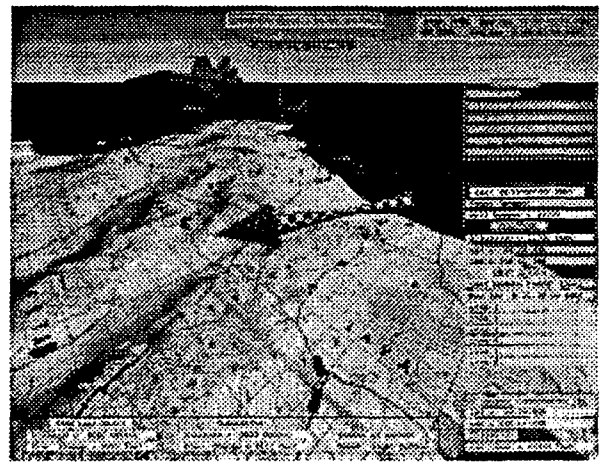
Another critical function of the ECOC, particularly in the constrained/urban environment, is airspace deconfliction. In the confined airspace above cities, aircraft of all types will be operating at the same time that artillery, mortar and rocket projectiles are being shot through the air space. To make this possible, radar coupled with computer management systems will be needed to predict each projectile and air vehicle flight path within the airspace above the city. The system will plan ingress and egress routes for aircraft and optimal firing trajectories and timing to allow full engagement of the enemy without interfering with flight operations.

In short, the ECOC will maintain a *single integrated air, ground, and trajectory common operational picture.*

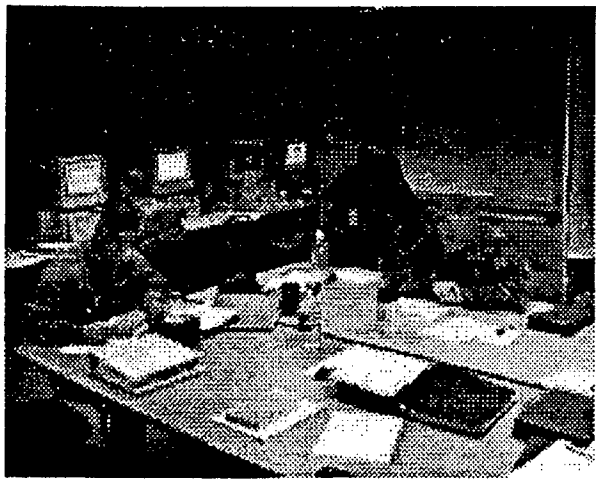
Intelligence

The intelligence function is especially critical to urban operations and supports two primary functions: battlefield visualization and situational awareness.

Battlefield visualization is the dynamic three-dimensional display and analysis of terrain, features, forces (enemy, friendly, and uncommitted) and events in sufficient detail to support tactical operations in urban terrain. Data from national, theater, organic and non-organic sensors, human intelligence and operational forces is fused into a common graphical picture. This picture is constantly refreshed with new data gathered through automated collection management. The goal of visualization is to produce the best available operating picture to support



The goal of three-dimensional displays — updated continuously by information from operating forces, national, theater and organic sensors — is to provide commanders with the best available operating picture to support decision making by the commander and the staff.



The "red" cell within the ECOC focuses on operational risk. This group advises the commander of possible enemy counter moves.

decision making by the commander and the staff. That picture will be continuously updated, to include special alerts when significant changes take place.

Situation awareness is the commander — and his staff's — understanding of the battlefield context in sufficient detail to support effective decision making. Context in this usage refers to people, environment, history, tactics employed by opposing forces, and a wide range of factors (such as culture, politics, religion and economics) Battlefield visualization supports situational awareness by depicting information — to include intelligence — in such a way that it supports rapid assimilation into knowledge and understanding such that critical decisions can be effectively made.

Within the cellular command element of the ECOC, intelligence is melded with communication and information management into the *combat information* function. The communications and computer systems used to tie the other information/sensor systems together will include a digital *shared net,* to rapidly move both voice and data automatically to those who routinely use it and to feed data into battlefield visualization systems. Data stored on the shared network is available on call to all those with a need for access to it.

Within the cellular command element of the ECOC, responsibility for maintaining combat information concerning both friendly forces and non-combatants as well as enemy forces as an inherent part of the operational environment is assigned to the combat information section. In addition to distributing and archiving information, this section is responsible for assuring the timeliness and reliability of information within the system.

The red cell is an integral part of the cellular command element charged with providing continuous interpretations of enemy capabilities, intent and potential impact on friendly intent. The concept of the red cell is that it is made up of combat arms officers — assisted by intelligence specialist/officers — intended to advise the commander to the potential courses of action and counter moves of the opposing forces with an emphasis on assessing *operational risk.*

Sensor Employment and Information Operations

Tactical sensors are a particularly important aspect of the information structure that must be specially tailored for the urban environment. Sensors developed for the extended battlefield will remain useful for monitoring approaches to urban areas. Sensors designed for wide-area surveillance, however, may have limited applicability within cities. Instead, sensors are needed that can observe inside buildings, into the sub-

Sensors constructed solely for the urban environment, such as the Hummingbird UAV, offer better means to collect information than ever before. In addition, they can conduct force protection missions by keeping an "eye" on cleared areas and potential trouble spots.

surface layer, within the urban canyons and into other critical areas denied to overhead sensors to detect the presence of explosives, chemical/ biological weapons, and personnel. The urban sensor array must include both broad area coverage and detailed surveillance, and must be capable of being emplaced in or moving through surface, sub-surface and above-surface areas for appropriate positioning. The resulting sensor data must be interpreted and then introduced into the shared net so that it is available to all who need it — task force commander, MAGTF commander, aircraft commander, or small unit leader.

One of the more significant uses for sensors in the urban environment is in supporting force protection initiatives by monitoring cleared areas and providing wide area surveillance. Wherever possible, sensors must be used in lieu of security forces in order to free the maximum number of Marines for more complex offensive and defensive roles than surveillance.

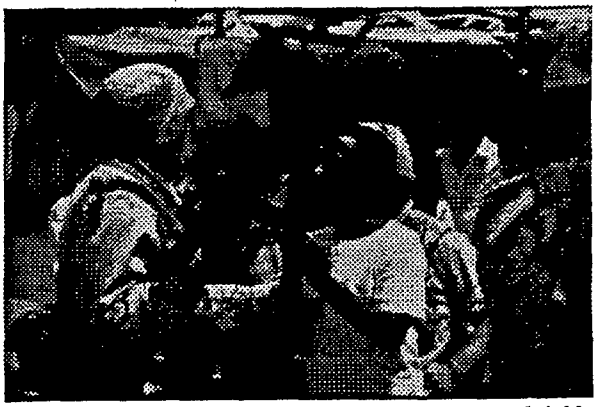
In the urban environment, sensors, improved information sharing, and information integration are not enough. Operations in the urban environment inherently require greater human intelligence (HUMINT) capabilities. Expeditionary forces cannot carry an infinite number of sensors. Even if they could, sensors cannot determine an individual's or group's intent.

In urban areas, the opposing forces may either be indigenous or look and act like the local population. Through HUMINT, it is possible to gain knowledge concerning where opposing forces operate, what characteristics distinguish their operations, and improve understanding of how the presence or activities of opposing forces are likely to affect the MAGTF's mission.

Intensive, sustained, highly focused intelligence operations will be executed throughout. During planning and advance force operations, tailored, up-to-date data bases on conditions in the urban objective area will be rapidly identified and accessed by operating forces and supporting establishment agencies. The resulting specialized data on areas/facilities/forces will be used by the MAGTF and naval task force to shape operations. Information operations will also be an important part of advance force operations and will support the battle space dominance and power projection functions essential to conducting operational maneuver from the sea.

Urban Fires and Target Location

The *requirement* for fires on the dense urban littoral is no different than on other battlefields, but the *nature* of those fires will be dramatically different. Fires can no longer be considered a separate or supporting function. The full range of direct, indirect, lethal, and non-lethal *fires* must be integrated into the engagement coordination process. Controlling collateral damage and non-combatant casualties starts with improved target discrimination so that we shoot the right targets. It also it includes target location so that we hit what we shoot at. Subsequent decisions must address type of weapon (lethal or non-lethal) to achieve the desired effect on target while controlling collateral effects. Choosing the type of engagement (direct or indirect) must be based on clear knowledge of available fires capabilities and their locations, the responsiveness needed to engage often-fleeting targets, and the required degree of precision. The selection of specific forces or



Due to the large numbers of non-combatants on urban battlefields, precise direct and indirect weapons systems must be developed. In addition, munitions must be devoloped for indirect fires that have scaleable effects, capable of taking out precise locations within buildings and other structures.

launch platforms (air, ground, sea) must be based on the ability to effectively engage the target balanced by risk to the engaging forces/platforms.

Fire support has two missions: **precise fires** to eliminate critical enemy elements and **suppressive fires** to block or prevent the enemy's attacking power. Both types of fires can be lethal or non-lethal as required. The critical difference in the extended and constrained battlefields is that fires are much more time-critical and require greater levels of accuracy than have previously been achieved.

Immediately responsive fires are the most important consideration for Marine forces operating on a dispersed battlefield. The combat effectiveness and survival of smaller maneuver forces may well depend on highly-responsive fire support. To achieve this capability, fire support systems must be capable of striking targets quickly and many many require allocation to maneuver units.

Fires in support of widely dispersed units cannot always wait for a set of circumstances and preset priorities at a command center. Marine units on the dispersed battlefield are maneuver elements that require fire support to complete their missions. The most capable and immediately responsive weapons are air-delivered munitions, loitering air weapons, or potentially, unattended ground systems such as the 120mm Dragon Fire mortar.

The constrained battlefield has some unique requirements which differ from those of the extended battlefield: fires must have suitable trajectories (trajectories that can clear the tops of buildings/obstacles to hit targets within the urban canyons), have first round accuracy, and scaleable weapons effects to cause the desired result on the target with minimal collateral casualties and damage. The accuracy requirements are critical. Nearly all missions will be danger close missions and the targeting must be in three dimensions.

Surface fusing of projectiles may not be useful in many cases, because targets may be inside structures, revetments, protected underground facilities, or in streets inside the urban canyons. Delay fusing will be required to effectively penetrate structures. In addition to the need for precision targeting and penetration control, indirect weapons must account for widely varying elevations on the urban battlefield.

Within the confines of the city, particularly where noncombatants are present, area weapons have a limited utility in order to reduce collateral damage. Currently, the most effective weapons are precision air-delivered munitions, air loitering weapons, and GPS or laser guided artillery and mortar projectiles.

Some emerging missile systems, such as EFOG-M, could allow MAGTF units to visually acquire their targets and use fiber optic cable to allow the operator to guide the weapon directly to the target. Current technological gaps which must be addressed are precision target location within urban terrain, high explosive, scaleable and non-lethal projectiles for air, artillery and NSFS weapons, and *urban fusing* for all projectiles.

Target Location

The key to effective fires on all battlefields — whether extended or constrained — is accurate and dependable target location. Whether a man-portable system, or a system mounted in an aircraft or a vehicle, a precision targeting system must be able to locate the target in three dimensions and transmit that position quickly over reliable communications means.

The range to target capabilities vary, with 10,000 meters as a desired daylight range for extended battlefield systems. A somewhat shorter range system may suffice in urban environments. Target acquisition at night and through battlefield obscuration remains essential.

In an urban environment, laser designators may be difficult to use in some circumstances with the reflectivity of window glass and other surfaces. In any system, target location will need to be sent rapidly through the ECOC or directly to the supporting weapons system.

Direct Fires

For the constrained battlefield, direct fire weapons that can accurately engage targets within structures remains a critical requirement. Ideally, such a system would have a soft-backblast launching system that presents a minimum signature and is safe for use in restricted areas. Other characteristics of direct fire systems are almost immediate arming mechanisms, mouse hole entrance capabilities, little or no signature/backblast, and light weight.

Snipers — both ground and aerial — can play a key role in both counter-sniper and force protection roles. In addition, if located in overwatch positions, snipers can provide protective fires for air assault operations and urban canyon crossing operations. One of the key objectives within *Urban Warrior* is the exploration of the use of anti-sniper technologies to include automatic counter fire systems and remote controlled ground vehicles with robust sensor systems.

A Marine using an early prototype of the Small-Eyes targeting binoculars. To direct fires accurately in the urban battlefield, a highly-reliable precision target location device — preferably lightweight and easy-to-carry — is a must.

Missile systems, such as the Multi-Purpose Infantry Munition/Short-Range Assault Weapon, have the capability for firing from within enclosures and are fire and forget weapons, but are expensive. SMAW is being refined as a fire-from-enclosure weapon and may further address urban combat capability shortfalls. The 120mm LAV mortar variant is another potential direct fire support system for urban combat that can augment tank main guns.

Marines need weapons capable of being fired from inside buildings. Current efforts to refine the SMAW may address this need, as may other fire-from-enclosure weapon systems.

Urban direct fire support effectiveness would be improved with warheads developed for enhanced concrete breaching, particularly steel-reinforced concrete. Current anti-armor shaped charge warheads are not well suited for urban fortification/breaching applications. Air delivered systems, such as attack helicopters — firing TOW, Hellfire missiles, or cannon — have merit against certain targets, but expose the helicopter to close range enemy fires when employed in cities.

Indirect Fires

The Naval Task Force/MAGTF will have an extensive range of fire support at its disposal: air delivered fires, long range missiles, gun-launched sea-based fires and ground-based fires. Current fuse and munition combinations, however, may inhibit their effective employment in many urban situations. NSFS systems, like the Vertical Gun System (VGAS) the Extended Range Guided Munition (ERGM) and Naval Tactical Missile System (NTACMS) have ranges of 100 kilometers

or more. These and other emerging naval munitions are capable of very accurate fire in support of deliberate attack against immobile targets. A drawback is time-of-flight. At their maximum ranges, times of flight are eight minutes or more.

Air delivered fires from attack aircraft, loitering weapons, or armed UAVs have shorter response times and can provide immediate support if those weapons are available and on station. Close air support will be conducted on both the extended and constrained battlefields. In both cases, employment will largely be opportune, requiring a high degree of flexibility in response to enhanced targeting operations. Rules of Engagement will play a central role. In the urban environment, weapons delivery will involve a high degree of precision to limit non-combatant losses and will often involve target designation by ground units operating within the urban infrastructure.

While the current array of fire support is impressive, there are some important gaps in capabilities. With the exception of a few specialized loitering munitions, there are no unmanned air weapons available. Standoff air-delivered weapons, such as JSOW and JASSM mitigate the danger to aircrews to some extent, but availability is limited to the time an aircraft can remain dedicated to that mission and remain on station. In addition, current artillery or mortars are limited to securable firing sites, with lines of support sufficient to provide security, ammunition movement and support for the crews.

Improvements in naval munitions will offer greater flexibility to MAGTF commanders in the future. Several developing munitions, such as VGAS and ERGM, have ranges greater than 100 kilometers.

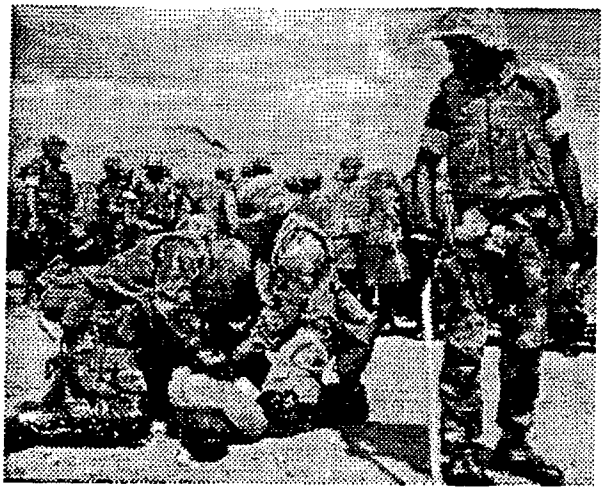
The Dragon Fire autonomous firing system (previously called the *Box Mortar)*, offers a complementary alternative to conventional mortar and artillery systems. It provides a crewless, self-loading, and remotely controlled indirect weapons system that can provide immediately responsive fire support to dispersed infantry units and can be transported in an MV-22. Its long range (up to 14km using its current production RAP round), 360 degree target engagement capability and 32 round magazine provides significant new options on both the extended and constrained battlefields. When linked to an effective sensor system, it also has applications as an alternative to anti-personnel minefields used for force protection or wide area denial.

Suppressive fires remains an important capability gap — particularly in isolating the battlefield. Where this requirement was adequately covered by artillery and mortars in past conflicts, the support and security structure for conventional artillery is a difficult task on the extended battlefield. Some possibilities to supplant conventional artillery for this mission are unattended artillery, loitering air platforms, or high-speed missile systems.

Non-Lethal Technologies

Non-lethal technologies provide additional options to the commander and are not intended to replace the use of deadly force. In urban operations, non-lethal technologies can be expected to have a wide range of potential uses. Indeed, non-lethals are limited only by the imagination and tactical experience of small unit decision makers.

The vast majority of non-lethal technologies currently available to Marine operating forces are derived from civilian law enforcement agencies that have used them for riot control and crowd dispersal situations. Others, such a *stun/flash grenades* have been employed by special operations and civilian SWAT organizations during hostage situations. Other technologies — such as sticky foams, slippery foams and quick



Non-lethal weapons offer Marines and their commanders numerous tactical options. Non-lethals may be used for a variety of missions, ranging from crowd control to closing enemy avenues of approach.

drying substances that can be used to seal or block doorways, windows and pipes — can be used to seal avenues of approach within buildings and to subterranean avenues of approach.

Aviation

All six functions of Marine aviation will contribute on the urban littoral battlefield. However, the nature of the urban battlefield, and the need to integrate aviation platforms into the engagement coordination process will shape how aviation operations are executed.

The urban environment provides several challenges for aviation support to specifically include assault support and offensive air support.

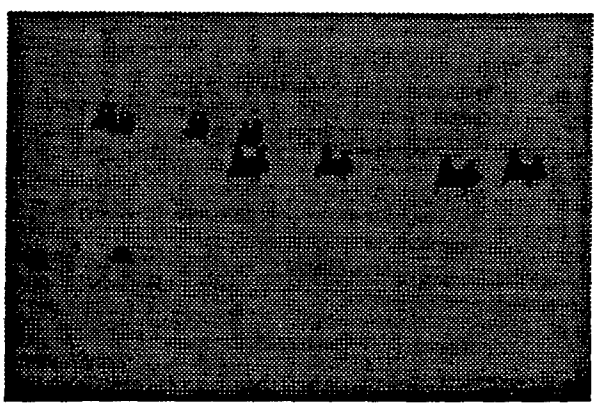
Assault Support

The nature of the urban environment and the potential for enemy air defense capabilities will demand the development of appropriate aviation tactics, techniques, and procedures. The potential difficulties for conducting air assault in the urban environment dwarf those of the hills, forests, jungles, and deserts of the rural environment.

The variety and complexity of the urban environment presents special challenges to assault support. There are thermal drafts, buildings and structures of various sizes, a constantly changing pattern of light during periods of darkness and, most seriously, an almost unlimited variety of locations in which to conceal anti-air tracking and firing systems. Numerous obstacles to approach and takeoff preclude flight operations from what otherwise might appear to be an adequate landing zone.

Development of concepts to increase the survivability of air assaults in the urban environment is another critical aviation issue. Hand-held air defense systems, integrated radar systems, thermal sites and other sophisticated anti-air assets are available to any potential foe with the means or methods to acquire them. The requirement to conduct simultaneous operations on both the extended and constrained battlefields with limited assets places a premium on survivability, deception and economy of force measures. Accordingly, assault lift will normally be reserved for penetration and lift of maneuver elements.

Decoys will be used extensively. For example, decoys may be used to simulate MV-22 sections during penetration operations and UAVs equipped with appropriate sensors will record enemy acquisition radar locations for subsequent destruction, through either the employment of jamming, decoys, or by homing in on and engaging tracking beams.



The ability of enemies, armed with shoulder-fired surface-to-air missiles, to shoot and hide in the urban environment is a major challenge to air assaults. Developing methods to increase the survivability of air assaults is a cornerstone of Urban Warrior aviation efforts.

Despite the difficulties, tactics, techniques, and procedures — and the necessary technology to conduct air assault and resupply operations — must be developed. One ground support experimental concept for aviation is an urban Suppression of Enemy Air Defense (SEAD) concept, where a relatively benign air corridor is established for a designated time over a designated space to facilitate the passage of assault and supporting aircraft. Conceivably, this corridor could be established primarily with counter-sniper sensor systems and immediate response weapons to retaliate immediately to threats.

Offensive Air Support

The three mission areas of Offensive Air Support (OAS) that are most relevant to the urban battle are:

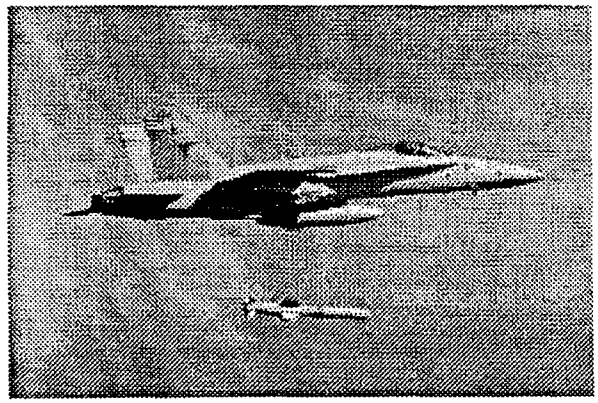
- Strike Coordination and Reconnaissance (SCAR)
- Armed Reconnaissance (AR)
- Close Air Support (CAS).

The urban environment poses unique difficulties in the conduct of each of these mission areas due to increased difficulties in maintaining situational awareness (SA) of friendly force locations and air defense threats. Other difficulties include identifying targets within the urban clutter, establishing clear routes for effective weapons employment, avoiding collateral damage and minimizing the adverse effects of buildings masking on communications line of sight with observers on the ground. At the same time, opportunistic offensive air support is particularly well suited for an air interdiction and urban isolation role.

During *Urban Warrior*, the focus will be on three issues: (1) exploring techniques for improving air crew SA, (2) developing improved techniques for target designation and marking by ground forces, and (3) refinement of CAS TTPs for urban employment. In most cases, experimentation will be conducted either by Marine Air Weapons and Tactics Squadron One (MAWTS-1) at MCAS Yuma, Arizona, or the operating forces. However, the overall intent is to develop a program that will have applicability across naval aviation and result in the ability for carrier aviation to conduct OAS with an understanding of the MAGTF/Landing Force commander's *intent* and scheme of maneuver. Accordingly, wherever possible OAS experimentation will be conducted in conjunction with Fleet Battle Experiments or Naval Strike Aviation Weapons Center (NSAWC) Fallon, Nevada.

Airborne imagery provides a unique visual and operational perspective of the battlespace for both the commander on the ground and the aviator in the air and can asist in maintaining SA and in rapid identification of targets. Near real-time transmission of both conventional and infrared photography into the cockpit through the *Forward Hunter* and *Photo-telisis* systems have demonstrated considerable promise and will be applied to urban target identification during *Urban Warrior*. The ability to receive and transmit photography and maintain SA of the situation on the ground may enable aircraft to provide pathfinding services to ground forces navigating in the urban sprawl while employing such technologies as *green beam* marking and other navigational aids to support ground maneuver.

The no-drop bomb scoring system and aircraft on-board recording systems will be used to evaluate the effectiveness of urban precision engagement. In addition, the feasibility of a



CAS tactics, techniques and procedures must be refined for urban areas. The Lab is working closely with the Marine Air Weapons and Tactics Squadron One (MAWTS-1) at Yuma, Arizona in developing experimental CAS tactics.

helicopter mounted, stabilized sniper rifle will be assessed. Ordnance that has cockpit selectable effect's — to include no explosive effect at all — would be well suited for use in attacking the wide variety of possible urban targets. The type of weapons guidance also needs to be examined. Traditional *smart* weapons may not be the most effective or the most useful in built up areas due to guidance system requirements.

Urban Infrastructure

The ability to precisely navigate into a landing zone in all weather and all light conditions — especially for medevacs and resupply — is crucial to maintaining a high tempo of operations. Whatever navigation technology is used must be passive and cannot have an emission signature that an opponent could exploit. Such systems as the Transportable Tactical Landing System (TTLS) will be experimented with to determine if such a portable precision terminal guidance system is viable using current technology and how such a capability can add to the expeditionary capabilities of the MAGTF.

Aviation will initially be available only from the seabase. Shorebased expeditionary fields and forward arming and refueling points (FARPs), however, may be required to support desired operations tempo. The role of engineer and support units will reflect changes in aviation employment patterns in the vicinity of urban operating areas. For example, there may be a need for a capability to rapidly establish helicopter operating sites atop high-rise urban structures using new technologies such as foam support.

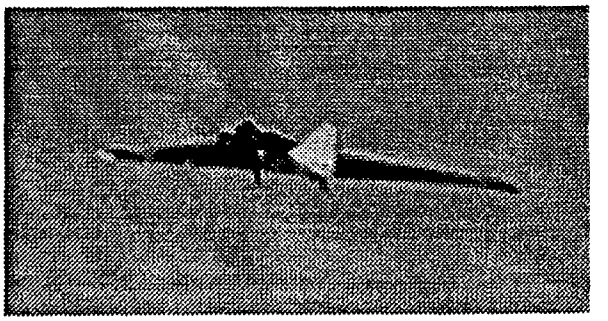
In addition, there remains a need to rapidly introduce fly-in packages of fixed-wing aircraft. Shore-basing adds flexibility for tactical aviation in conducting continuous operations independent of deck cycles. A fly-in package could consist of a mix of C-130, F/A-18, EA-6B and AV-8B aircraft. It would require a slice of the MACCS designed to aid the MAGTF commander in the coordination and control of aviation assets as an integral part of the MAGTF ACE and in coordination with sea-based naval aviation.

FARPS to service fixed wing aircraft would be small, highly-portable and rapidly disassembled/ reassembled. The intent is to be able to transform civilian airfields, temporary air-fields employing expeditionary matting or a length of local highway into a usable airfield for short periods of time.

Tactical UAV

The ability of a responsive tactical UAV to transform the extended, open battlefield was demonstrated during *Hunter Warrior* by the use of the Dragon Drone tactical UAV using a *pan-tilt, zoom* camera and presenting an IR signature too small to be tracked by the Stinger missile system, it was able to provide the MAGTF commander with a video of the battlefield from over 150 miles away via satellite relay. Additional capabilities such as FLIR cameras for night operations, remote delivery of sensors and non-lethals, and radio relays are additional capabilities the Lab may incorporate in future models of the evolving Dragon Drone.

On the extended battlefield, targets will frequently be detected using concepts such as *rolling UAV reconnaissance zones* involving Dragon Drones and other sensor assets employed on key avenues of approach to the urban objective area. In addition, UAVs can play an increasingly important role in force protection during operations in urban environments.



The Dragon Drone is a tactical, unmanned aerial vehicle capable of being "handed" to squads on the ground. Armed with a pan-tilt, zoom camera and presenting an infrared signature too small to be tracked by anti-air systems, the Dragon Drone has proven be a key sensor on the extended battlefield and offers several capabilities, including force protection, for the urban environment.

During *Urban Warrior*, the Dragon Drone experience will be built-on to explore the utility of rotary (and by inference tilt-rotar) UAVs in the urban environment. Specifically, we will explore the relative merits of having a platform capable of hovering or temporarily landing on key vantage points and the tactical implications of UAVs used to conduct day and night surveillance and reconnaissance as well as target acquisition on the urban battlefield. Additional uses such as the remote delivery of non-lethal technologies, a limited capability to detect the presence of aerosol chemical-biological agents, radio relays, and target designation — to include the detection of the presence of individuals through the walls of buildings — will be explored.

Urban Warfighting

Urban warfighting presents a number of challenges. One of the more significant is force protection. Rapidly erectable shelters, protective sensor systems, potential employment of robotic machines, reconnaissance inside buildings and the use of obscurants to shield maneuver through danger areas require exploration.

Another significant challenge is that of ensured mobility in the constrained urban battlefield. Debris, panicked non-combatants, collapsed structures and interdiction by fire from concealed positions can prevent effective movement on the floor of the *urban canyon.* Accordingly, within the dense urban environment, the primary means of mobility are foot and, where tactical conditions permit, heliborne movement. In addition, small units will employ new suspension and projection technologies to rapidly move across the streets composing the *urban canyons* well above the *floor* but below the *rims.* Using such horizontal movement between and through buildings, small units will move to bypass strong points and gain tactical advantage. Complementing movement above the floors is subterranean mobility in subways and sewers. While heliborne mobility will be a principle means for introduction of forces, a variety of factors — to include the presence of a manportable air defense missile threat — will determine how large a role it will play.

As the Lab moves towards developing new operational concepts, tactics and techniques for the urban environment, it is apparent that additional military skills will be required to conduct certain types of operations. Just as some infantry battalions have equipment and Marines who are trained as lead climbers for mountain operations, there may be a requirement for specially trained Marines and equipment for urban operations.

Urban Rope Suspension

Several specific requirements for specialized equipment and skills in the urban environment have become apparent. First is the capability to traverse the urban canyon through the use of rope suspension. Second, is the capability to traverse the urban environment via subterranean modes, and third, is the requirement to traverse the urban environment above the surface without the use of helicopters/aircraft.

Traversing the urban environment at the appropriate time and place is a vital requirement. This includes the capability to maneuver to and between buildings/structures at any point. Units must not be restricted to entering buildings from the ground level or from the top. The capability must be developed to traverse from one structure to another at any elevation. Capabilities must be acquired, and

Debris, non-combatants, collapsed structures and the three-dimensional aspects of the urban canyon make cities the most dangerous battlefields in warfare.

techniques developed to facilitate the movement of infantry and reconnaissance units (this includes supporting attachments such as engineers and FOs) from building to building above the ground level. In short, if a commander wishes to traverse from the 12th floor of one building to the 15th floor of another, he should have the capability to do so.

In addition to the capability to traverse from structure to structure, combat units must have the capability to maneuver throughout multi-story structures without the use of stairs or elevators. This capability must include both internal and external capabilities. This must also include the ability to move from top down and bottom up.

Capabilities should not be limited to ropes only. For example, the capability may exist or be developed that would permit movement on elevator cables without the use of ropes. For purposes of simplicity and conveyance of thought, the title Urban Rope Suspension is used.

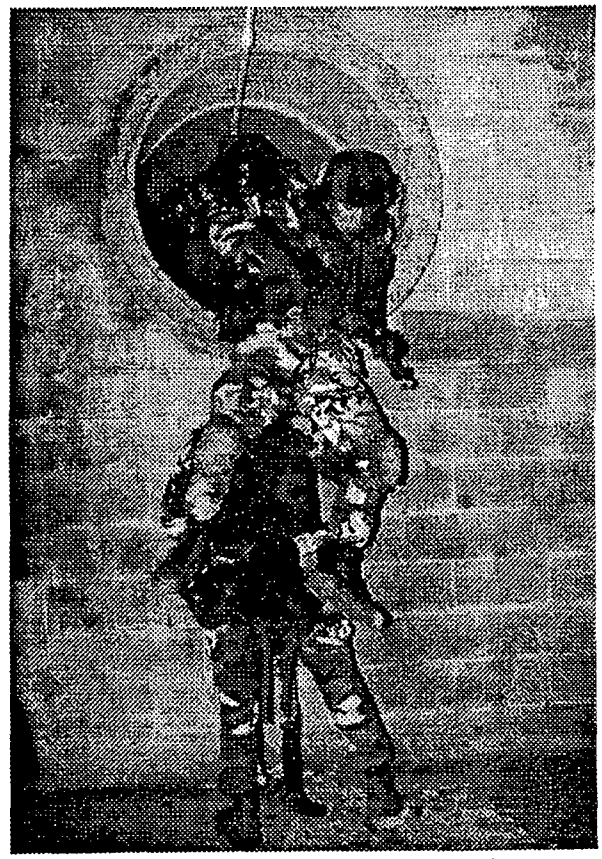
Capabilities and techniques must be as simple as possible in order to facilitate their use by combat units without the requirement for extensive training. If this is not feasible, the alternative is to develop capabilities and techniques that are taught to select individuals within a unit, who are then responsible for creating the suspension systems for the other members of their command. Under this concept, a few individuals would receive extensive training in the skill, while the average member of the unit will receive only the training necessary for him to effectively and skillfully utilize the established system. The preferred option is to develop capabilities that are simple and effective enough to be employed by any Marine with limited training.

Subterranean Movement

Just as the requirement exists to traverse the urban environment on or above the ground, the capability to maneuver below the surface must be developed. This must include the capability to navigate and communicate. Subterranean movement includes the ability to traverse all types of natural and man-made subterranean features (caves, caverns, sewers, power conduits and subways).

As part of this capability all types of underground systems and access points must be found. The capability to navigate through these systems, communicate and report locations are basic requirements. Capabilities to operate and survive in the various types of underground systems must be developed. Some examples include: effective transportation means such as sleds or trolleys, specific survivability enhancements such as air quality sensors, non-fragmentary or ricocheting weapons systems designed for close quarters, and the use of robotics or mechanical *snakes* to provide advance reconnaissance through potentially dangerous underground avenues.

Sewer and underground utility systems offer one of the most clandestine avenues for penetrating the urban environment. These systems, however, may be hazardous or impenetrable without specialized equipment and training. For example, human waste material and contaminated



Underground mobility, usually through storm and sanitation sewers, is an unique avenue of approach in the urban environment.

water may be so deadly to an exposed human as to render them ineffective. Similarly, firing of conventional weapons in an environment with a high methane content may pose unacceptable risk.

Transport systems that can be utilized within sewers and underground passages to limit direct exposure of operating units to contaminants and to speed maneuver may also be required. Finally, the development of specialized operational and tactical skills for the subterranean environment must be developed. As with rope suspension, these skills may be a sub-specialty taught to a few members of each unit vice all personnel. As was discovered in the clearing of tunnels during the Vietnam War, many personnel are unsuited for operations below ground. Specialized equipment for operations within the subterranean environment must also be developed and procured for urban operating units.

Just as special skills, techniques, and equipment are developed for operations within sewer systems, similar examination must be made of other types of underground passages, such as subway systems. As an example, the capability to utilize the existing transport system, or to leverage portions of it must be developed. This would include the capability to operate the existing system, and/or the development and employment of a self-powered conveyance that can operate on the existing track system and transport sensors, personnel and supplies.

Above Surface Individual/Team Flight [ASITF]

This capability will provide the commander the ability to conduct potential clandestine penetration of the urban environment through the air. Small units or teams can rapidly penetrate the urban environment to conduct a variety of missions. Teams can seize selected objectives, isolate prospective HLZs, conduct screening missions and perform reconnaissance.

Currently several options exist for ASITF. These include paragliders, parachutes, and powered parafoils. All of these options should be explored within the following guidelines. The system should be easy to operate and to learn. It should give the user maximum flexibility and options for landing and subsequent takeoff. It should possess maneuver capability in order to avoid obstacles, defenses, fires and other threats.

As with the two previously discussed capabilities — rope suspension and subterranean movement — the chosen capability should be as simple as possible in order to be used by the average infantryman or reconnaissance scout. If this is impossible, or impractical, then select personnel should be trained in the necessary skills to operate the equipment and conduct specialized missions.

Taken as a whole, the above capabilities offer the commander additional options for maneuver in the urban environment. They begin to open the door for utilizing the tenets of maneuver warfare in the urban battle. They can potentially offer the commander the flexibility to choose options for maneuver beyond those now currently available, thus striking at the enemies vulnerabilities, flanking his strengths, and striking where he is least prepared. They offer the capability to move in the urban environment with greater force protection, offered by surprise and speed, than is now available. They do, however, require special skills, training and equipment that is not currently available.

Seabased Sustainment (Combat Service Support)

Future expeditionary sustainment will be based on the maxim that friendly centers of gravity/vulnerabilities will be sheltered while opposing centers are exposed. The support of non-contiguous maneuver elements on the extended battlefield and widely-separated urban engagement areas in the constrained battlefield will require a minimal footprint ashore and maximum freedom of maneuver. Accordingly, sustainment will rely on seabasing, supplemented by opportune use of indigenous resources. Developing our ability to effectively *forage* for power, water, and fuel may provide a

significant reduction in the logistics requirement on the seabases. (Examples include adapters to permit use of indigenous power when operating at fixed sites within urban structures rather than using military unique batteries, man-portable water purification for drinking water, and fuel testing devices.)

Information technology is likely to offer the greatest leverage in creating the logistics system of the future. The full benefit, however, will be gained only by applying it in the context of logistic enterprise processes that draw together, in an integrated and deliberate design, all relevant activities to accomplish specific goals within a common vision. The vision of Marine Combat Service Support and Marine Corps logistics of the future will, and must be, ***to replace our footprint and inventory (mass) with speed and information (precision)***. Only in this way can logistics be changed.

Logistics in its basic form is simply providing supplies and services to a customer. The challenge is to reduce or eliminate the time from the customer request to when the supplies or services are received. The goal is to accomplish this without having huge inventories on hand. Beyond this *business* perspective of response time and distribution, Combat Service Support (CSS) must be fully capable of providing services and support in the fast-changing, mobile warfare environment envisioned for the future.

Central to future Combat Service Support must be a fully integrated, ***anticipatory*** CSS Command and Control system. Logistics operations in the fast-changing, mobile warfare environment will have to be thoroughly but rapidly planned, tightly controlled, and precise in delivering supplies and services. Data, communications and automated decision support aids will be the lifeline of logistics operations.

The most timely way for a logistician to provide supplies and services is to not have to provide them at all. If a unit is on a five day operation and is carrying five days of rations, then there is, theoretically, no resupply requirement. Certainly, there is a down-side. The individual Marine has to carry the rations. Future technology, however, will provide the opportunity to reduce or eliminate this burden, allowing the logistician to ***embed the supplies*** and services in the machines, weapons or personnel. Improvements in operating methods, precision ordnance, and material reliability will also reduce logistics demand.

By combining the two, ***anticipatory logistics and embedded logistics***, it is envisioned that the *iron mountain* can be replaced with precision distribution.

Supply

The focus of sustainment for Urban Warrior will be to provide supplies and services to a MAGTF from a sea-base with little or no CSS footprint ashore. This will include several evolving and developing support concepts that will be carried out with ready and near-ready technologies. CSS C2 will be fully integrated into the overarching system to provide anticipatory CSS, total asset visibility, in-transit tracking, reachback to the military-industrial complex, access to urban databases, simultaneous and corroborative planning by geographically dispersed staffs and a common operating picture.

The future of supply must focus on a distribution flow focusing on efficient and precise management of resources and requirements to sustain the force — vice warehousing the mass of supplies in forward areas. As one example, a very limited supply block might be embarked afloat for initial resupply, which would be replenished through precise anticipatory CSS. Replenishment could be effected with a demand-data "reachback" capability that would link the forward-deployed MAGTF with the military industrial complex on the supply side, and with international distribution systems porviding the sustainment transportation link. The overall effect would be to greatly reduce CSSE deployed mass.

Afloat warehousing, as currently practiced, will be replaced by afloat distribution centers, with a focus on providing in-stride sustainment, or "the right stuff at the right time." Through a

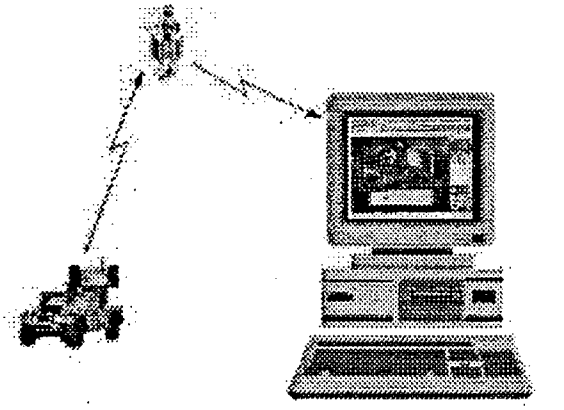
precise, anticipatory information system, the CSS element will manage the flow of supplies into and out of the afloat distribution center. Total asset visibility will allow the CSSE to know exactly where all resources are, in what quantities, what's inbound and when it will arrive. This real-time knowledge of inventory movement within the sustainment pipeline will allow for appropriately sizing the delivery means for just what needs to be delivered, and when — which is the essence of effective distribution.

Other advances leading to weight reduction of material, increased reliability of equipment and precision targeting to reduce ammunition demand will geometrically contribute to reducing mass and increasing speed of material in the distribution pipeline. Seabasing itself will reduce personnel and equipment footprint ashore leading to reduced food, water, ammunition and fossil fuel requirements.

Maintenance

The concept for future maintenance is to significantly reduce or eliminate maintenance requirements through increased equipment reliability and the remote maintenance of "sensored" vehicles. *Maintenance*, both preventive and corrective, will largely be accomplished remotely by *mechanics afloat.* Remote vehicle maintenance is a concept that has the potential of significantly increasing the operational effectiveness of forces ashore while at the same time reducing the need for warehousing space afloat. The concept envisions sensored vehicles ashore that can be monitored on a PC-based platform by mechanics afloat. The system will automatically search vehicles ashore and produce displays on the vehicle is operating.

The mechanic afloat will be able to monitor the principle indicators of vehicle systems and sub-systems, and provide graphic presentation of data such as vehicle temperature, pressures, cooling system, fuel system and battery condition. From this workstation afloat, the mechanic will adjust



Advances in computer technologies allow for remote tracking of vehicles for fuel and maintenance needs.

vehicle operating parameters when it is identified that the vehicle is operating out of specification. In many cases, the systems will be able to *self-adjust* its own equipment to optimize performance. This capability alone will greatly extend the operational readiness of the force, preventing catastrophic failures which might occur.

The mechanic of the future will be able to anticipate equipment failure so they can be either preempted or repaired promptly. Data from sensors will be matched to design standards and performance characteristics to detect trends. This will allow the mechanic to predict when catastrophic failures are likely to occur and, through digitized diagnostics and digitized technical manuals, identify the parts required to fix the failure. Parts might be ordered and received before the failure occurs.

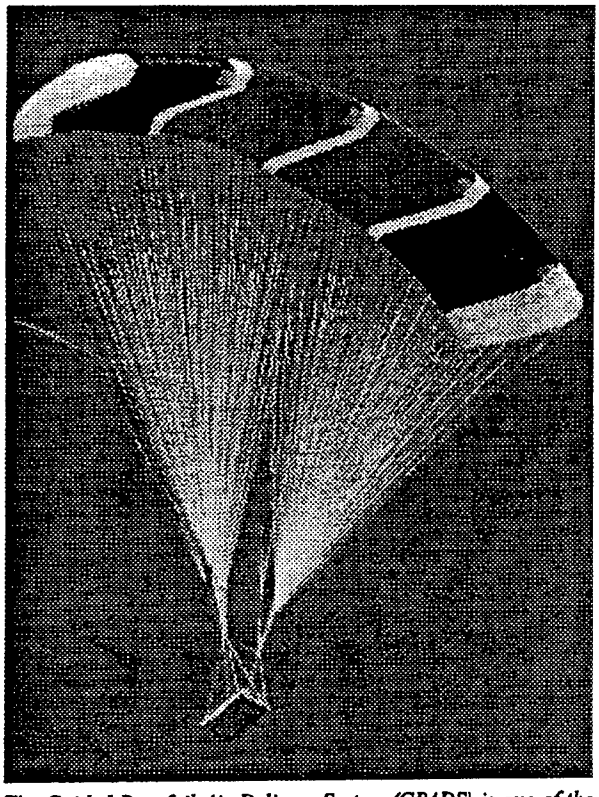
In order to reduce or eliminate maintenance contact teams ashore, future repairs to vehicles might be done by the operator. Computer-based training for the operator, to provide the equivalent of a mechanics level diagnostic ability, will allow for the parts received afloat merely to be pushed forward to be installed by the operator ashore. Likewise, computer-based training — integrated with the digital technical data and made available to the operator ashore — will provide the necessary match of equipment and skill. Additionally, a tele-maintenance capability, linked to the mechanic afloat, will provide the

operator a connection to *virtual expertise* should it be required.

Transportation

Transportation will focus on the tactical sustainment of the force. To enhance survivability and reduce exposure of assault lift assets to enemy manportable air defense systems, distribution will rely primarily on a combination of light and heavy, powered and unpowered, drone assets for ship-to-objective area delivery, as well as tactical distribution on both the extended and constrained battlefields. These will be supplemented by light surface vehicles appropriate to the urban environment.

Ship-to-unit distribution is a response to the perception that the future expeditionary battlefield will have no secure fixed rear areas such as beach heads or supply dumps. For these reasons, Combat Service Support areas of the past are no longer tactically sound. The seabased resupply of forces on this widely dispersed, non-contiguous battlefield will present significant challenges to the combat service support element and require a new generation or family of delivery systems.



The Guided Parafoil Air Delivery System (GPADS) is one of the technologies being explored by the Lab for ship to unit resupply.

Ship-to-unit distribution must adopt the philosophy of appropriately sizing the delivery system for what needs to be delivered. Particular attention must be given to the heavy lift requirement, liquids, in support of ship to objective maneuver. The CSSE must therefore possess a range of delivery systems, both manned and unmanned, that operate on the land, in the air, and at sea. Autonomous, unmanned aerial and surface delivery systems provide likely means of complementing manned vertical lift capabilities to deliver supplies ashore.

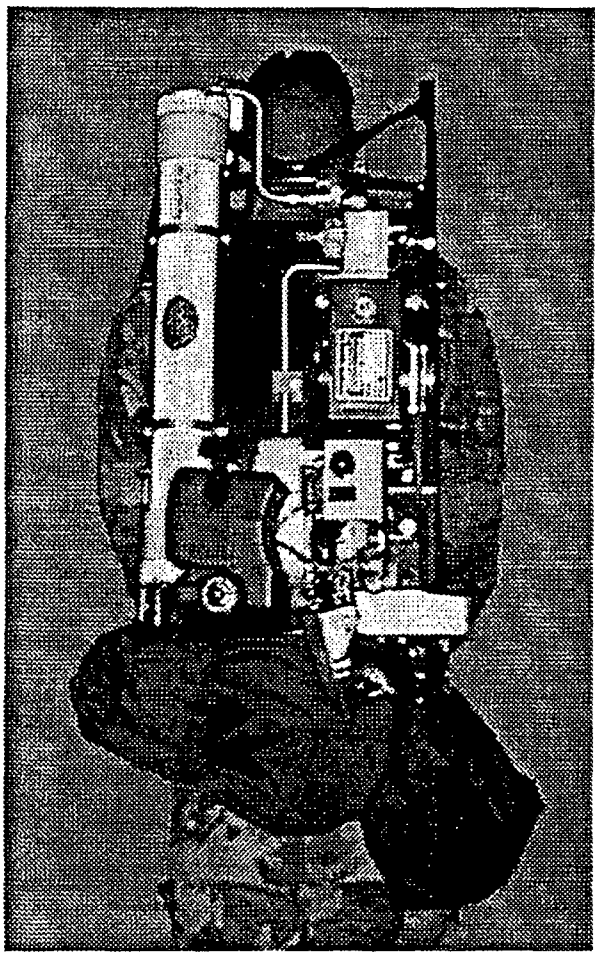
In order to augment resource harvesting, the technique of prepositioning caches of supplies might be used. These caches might be generic in nature, consisting of water, rations and batteries for the tactical systems each team carries, or specifically tailored to a specific force in anticipation of a given need at a given place and time. The cache might be emplaced by manned or unmanned delivery means or by a team clandestinely inserted. These caches must be positioned in such a way that the enemy forces are not aware of the location.

Source-to-ship distribution refers to the shipping link from the continental United States to the seabase, as well as an air link into a *near theater* land-base for subsequent transport to the seabase by theater assets. Each method has its own set of drawbacks.

General Engineering

General engineering will focus on virtual engineer reconnaissance and innovative mobility and counter-mobility tasks tailored to an urban environment.

Like maintenance, general engineering of the future will rely on embedded logistics and information in order to reduce requirements. Use of alternative non-fossil fuels will significantly reduce fuel and power requirements. Information systems which provide data on in-theater facilities —



The Portable Reverse Osmosis Water Purification Unit (PROWPU) is one of many emerging technologies being examined as part of Urban Warrior.

water, fuel and electrical infrastructure — will allow for *resource harvesting* and further reduction of general engineering requirements.

Fossil fuels represent the largest single footprint and distribution challenge for seabased logistics. Likewise, dependence on fossil fuels limits tactical mobility. Wind and solar power is a quiet, low maintenance alternatives to fossil fuel generators. Like other forms of renewable energy, wind turbines are non-polluting and are driven entirely by nature's forces. Smaller wind turbines are sometimes used to power loads directly. They can also be run together into a single power grid, such as the windmill farms at Hot Springs, California, to produce power for large applications. As technology advances, more opportunities for the application of renewable energy will appear.

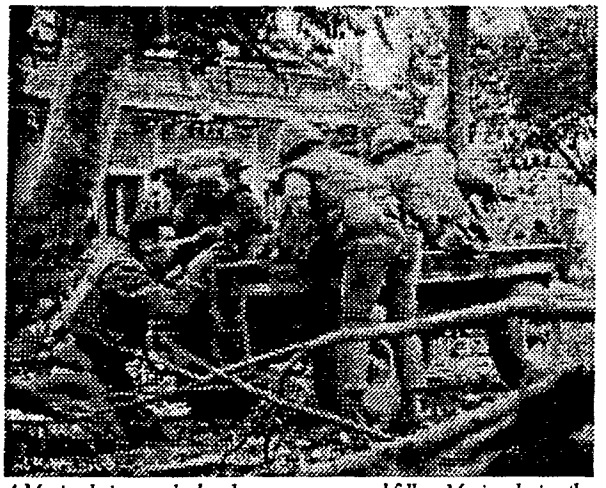
A major focus of effort for general engineering of the future will be on virtual reconnaissance. Through the use of information systems, engineers will be able to identify in-theater infrastructure such as water and electrical distribution systems, devise plans for the control or isolation of these systems without destruction, and plan for their follow-on use by friendly forces. This *resource harvesting* through information management will significantly reduce general engineering requirements specifically, and CSS requirements overall.

Expeditionary Medicine/Health Services

Expeditionary Medicine/Health Services will examine three broad areas that effect the ability of a naval expeditionary force to sustain human performance ashore. Casualty management concepts must solve the basic tension between care at the point of injury or wounding and rapid evacuation to the seabased sanctuary. Over-reliance on *care forward* results in a geometric increase in the *friction* applied to the maneuvering unit. Speedy evacuation compromises survivability. Hence, the focus of experimentation will be aimed at the proper balance between *care forward* and *evacuation* to the sea-based sanctuary.

Specifically, what is the optimal role for the individual Marine at the point of wounding? What is the requirement for resuscitative surgery, far forward, given that such a function is likely to greatly increase the footprint ashore? Given a rapid shift in tactical objective from offensive combat operations to civilian collateral casualty clearing, what relationship exists between medical assets committed and mission objective?

The second element is human performance. What are the measures of proper physical conditioning for urban operations? What are the predictors of failure — psychological as well as physical — when small units are operating continuously in widely dispersed small units? Given that a single *failure* in such small units



A Marine being worked on by a corpsman and fellow Marine during the battle for Hue City in 1968. A key focus of Urban Warrior is improving casualty management concepts. Photo courtesy of Don North.

results in a disproportionate loss of offensive power, what is the balance between the requirement to continuously press for the tactical advantage, while risking serious breakdowns in performance, judgment or even perception.

Finally, what information serves the requirement for accurate clinical data exchange between *care forward* and care rendered later in the course of treatment. In the aggregate these experiments may only serve to further focus on the complex inter-relationship between human performance and offensive power.

Services

The various miscellaneous services that the CSSE provides — from contracting food services to POW handling to postal service — will be fundamentally changed by the evolving information systems. Paper may very well be obsolete as the medium for conducting and recording the business side of military operations.

Personnel management will be handled by a *credit card* which contains a reusable memory and a microprocessor chip. This card will contain all information which can be associated with a person, from training information to medical information. This card will replace the paper records, and will be used to update data repositories within the system. Through technology such as the smart card, personnel management may become a candidate for reachback services much in the same way disbursing management is currently conducted from Kansas City, Missouri. Numerous other applications are likely to emerge for this card such as personnel manifesting, weapons custody and security.

Instrumentation

Automated instrumentation and data collection systems enable us to collect the detailed data needed to analyze and assess complex experiments in such a way that the data collectors do not interfere with the experiments. Built as separate systems, instrumentation systems are very expensive and duplicate some data that tactical systems produce. The realization that much of the data collected by instrumentation is the same as that provided by digital C4I systems offers an opportunity to reduce the cost. A concept for so doing, called *modular instrumentation*, was developed and implemented during *Hunter Warrior*. The concept was simple: use tactical systems to the greatest extent possible to gather data, and only build additional, instrumentation-only components when necessary data cannot be gathered any other way.

During the *Hunter Warrior* post-AWE assessments, analysts and operators realized that in addition to operational data being useful to the analysts, analytical data is also useful to the operators. This led to the *tactical instrumentation* concept. In this concept, instrumentation is an integral component of the tactical system, and provides instrumentation data to the commander/staff during real-world operations. Ultimately, tactical instrumentation is intended to be a "plug 'n play" system in which the units plug in selected existing components (such as MILES gear) for training or experimentation. The training components provide the simulated activities that support training realism. For example, MILES gear is used to simulate direct fire during force-on-force training or experimentation. When the unit "goes to war," the training/experimentation support components are

"unplugged" and the unit deploys with the remaining components of the system. In other words, except for training/experimentation support systems, all components of instrumentation are part of the tactical C4I system.

Full "plug-n-play" tactical instrumentation will probably not be achieved during *Urban Warrior*, but developed proof-of-concept systems for all required instrumentation capabilities will be. These capabilities are as follows. First is data communication, which will "piggy-back" on the tactical communications architecture. Position-location information will be provided by a combination of the differential GPS receivers (DGPS) in the tactical C4I system, additional "transponders" that combine DGPS position-location to the individual Marine and automatic position reporting through the C4I system, and inside-building position location instrumentation. For inside-building instrumentation, a low-cost system that pinpoints which room an instrumented Marine is being pursued. This simulates an inertial navigation system (INS) that, in combination with DGPS, provides tactical position-location information in the future. The INS will not be available in sufficient quantities in time for the *Urban Warrior* AWE so instrumentation will simulate that capability.

Both the transponders and tactical PDAs will be integrated with MILES. The experimental systems will have a low-cost means of integrating MILES that works with both existing and next-generation MILES gear. The "MILES monitors" provide two capabilities. First is the ability to monitor the live-dead status of Marines during force-on-force experimentation. Second is the ability to notify Marines "in the field" that they have become casualties due to indirect fire or air weapons. This capability works hand-in-glove with a gateway that ties into an

After Urban Warrior, the tactical instrumentation systems used for proof of concept will be available as a residual training system capability. The intent is to continue additional development of tactical instrumentation to the point that it is fully integrated into and deploys as part of the tactical C4I system.

existing simulation to adjudicate the fires of non-direct fire weapons (i.e., all weapons except those simulated using MILES gear). During *Urban Warrior*, JTS — the current joint tactical simulation for urban areas — or its follow-on, JCATS, will be used.

During *Urban Warrior*, two means for manipulating voice communications will be experimented with. The first is voice-tagging, in which voice transmissions will be associated with the transmitter's display icon on the situation awareness display. During training/experimentation, this allows evaluators and analysts to associate voice communications with the position and activities of the tactical forces during replays. For tactical use, this would provide the capability to identify and replay critical voice transmissions. The second experimental means is speech recognition. If it works, it will provide a text record of communications. Such a record is extremely useful in experiment or training exercise reconstruction and analysis. For tactical use, it could provide an automated watch log capability.

Finally, during *Hunter Warrior*, an automated data collection system (DCS) that records, stores, and sorts experiment data (e.g., position reports and text messages) was developed. This system will be used in *Urban Warrior*, but it is being improved to provide automated analysis, assessment, and display tools to speed the experiment analysis/training assessment process. The DCS will be coupled with a large-screen, high-resolution display capability for use both by experiment/exercise control agencies, and for post experiment analysis/exercise after-action reviews (AARs). For tactical use, these systems provide a capability to store, sort through and replay critical data that is not archived by other tactical systems (and to integrate and display archived data from other systems). Within the experiment/exercise control facility, either software or routing "firewalls" will be used to separate *ground truth* force instrumentation data, ensuring that the players on both sides receive only the data that would be available to them from their operational capabilities. Obviously, in a tactical system such firewalls would be removed before deployment.

After *Urban Warrior*, the tactical instrumentation systems used for proof of concept will be available as a residual training system capability. The intent is to continue additional development of tactical instrumentation to the point that it is fully integrated into and deploys as part of the tactical C4I system, and also includes plug 'n play "hooks" for attaching training systems for experiments and training exercises.

"During Hunter Warrior, we found that analytical and operational data was useful to the operators."

- **Integral component of tactical system**
- **Provides instrumentation data to the operator/staff during real-world operations**
- **Ultimately intended to be a "plug and play" system which is plugable into selected existing components**

Unit and Tactical Decision Maker Training

During *Urban Warrior,* the Marine Corps Warfighting Lab will explore current U.S. and allied tactics, techniques and procedures with the goal of developing a unit training program that will be tested and documented for implementation Marine Corps wide. In addition, it will expand on the *Clear Thinking* training that was successfully implemented during *Hunter Warrior.* This effort will focus on improving the tactical decision making skills of the squad leader leading to creation of a combat squad leader course of instruction.

Unit Training

Unit training for urban operations must take a combined arms approach rather than focus solely on techniques for room clearing usually associated with civilian law enforcement SWAT training. Accordingly, future ground unit training for Military Operations in Urban Terrain must have the following characteristics:

- inherently include the combined arms approach, integrating indirect fires, air support, and the use of non-lethal technologies.
- incorporate significantly expanded combat engineer participation both in direct support of individual ground combat elements and in providing breaching instruction to infantry units.
- realistically incorporate casualty training based on the need to provide both first responder training and combat evacuation other than helicopter evacuation.
- incorporate rules of engagement training that includes specifically rapidly changing circumstances and the involvement of non-combatants.
- sniper and counter-sniper operations.
- force protection techniques to include the use of sensors in the urban defense for wide area denial.

To support such unit training, not only is the traditional MOUT facility is required but specialized training facilities that assist in developing techniques and procedures and maintaining unit proficiency are required. Some examples include:

- urban maneuver range in which chalk, paint or laser guns are used during force-on-force training operations to teach maneuver techniques and fire discipline.
- night vision ranges for the use of night observation devices in a variety of low-light conditions endemic in urban operations.
- urban breaching range for training in the use of breaching explosives but direct fire weapons against buildings and a variety of fortification materials.
- instrumented aviation urban weapons employment range.

Aviation and combat service support unit training also requires modification to prepare for future urban operations. Aviation units must specifically focus on developing situational awareness in the cockpit and employment of their systems within the urban environment. The *Aviation Combat Element Military Operations On Urban Terrain Manual,* published by MAWTS-1, provides specific guidance as to the unique characteristics of aviation operations in urban terrain. Combat Service Support units must plan and train for the specific requirements of urban operations characterized by expanded requirements for foraging for resources within the urban environment in order to reduce the footprint of logistical support needed from the seabase and requirements to repair, operate or support local infrastructure utilities, and concepts for providing forward support to engaged forces.

Marines from "C" Company, 1st Battalion, 6th Marines head for their bivouac site after one of the experimental vignettes in Urban Warrior's first limited objective experiment in January 1998. One of the goals of Urban Warrior is the development of an unit urban training program.

In addition, MAGTF staffs must be prepared to support non-government organizations conducting humanitarian relief operations and be able to respond to a host of civil affairs and combined operations challenges.

Combat Squad Leader

During *Hunter Warrior,* infantry squad leaders were given the opportunity to demonstrate how a Marine infantry squad leader — provided with experimental target identification and communication technologies, additional training in small unit decision making and the opportunity to train as a squad — could become capable of operating as a separate tactical entity. These squad leaders controlled supporting arms in a manner normally associated with specially-trained forward observers and forward air controller officers. These skills explored the potential for infantry squads to extend their offensive reach through the precise employment of supporting arms. During *Urban Warrior,* the potential contribution of the small unit tactical leader will be again be explored — employing selected technologies, additional training in tactical decision making and specially prepared squad training programs — in an effort to apply dispersed tactics in the difficult urban environment.

The objective of Combat Squad Leader training is to provide the foundation for the squad leader to assume four key roles: combat leader, small unit tactician, trainer and decision maker. The center-piece of the Combat Squad Leader course is a tactical decision making syllabus, based in part on the *clear thinking* training of *Hunter Warrior* with a special emphasis on fundamentally changing the capabilities of the infantry squad leader to operate as a tactical commander. The intent of the training is to hone the squad leaders decision making skills and ability to act as a *On-Scene Tactical Commander.* In this role, the squad leader will be expected to not only coordinate with other squads as well as higher headquarters, but to also employ support-

Squad leaders performed superbly during Hunter Warrior, calling in both indirect fire support and air strikes in a manner usually associated with forward observers and forward air controllers. The Combat Squad Leaders Course, being developed at the Lab, will emphasize four squad leader functions: combat leader, small unit tactician, trainer and decision-maker.

ing arms while directing the fire and maneuver of his squad.

As initially conceived, the Combat Squad Leader Course has four components:

- a basic squad leader tactical syllabus designed to provide combat proficiency for the squad leader in combat operations.
- an advanced tactical decision-making syllabus involving clear thinking instruction designed to improve recognitive learning, critical thinking, and risk assessment.
- a computer assisted decision making range that can be used by a unit leader to test and train squad leaders in situational decision making at the platoon and company level.
- a series of squad problems designed to be conducted at the unit level for use by the squad leader in training his squad.

The intent is that every combat squad leader in the Urban Warrior Advanced Warfighting Experiment will have successfully completed all four components of combat squad leader training.

In addition, a satellite training package will be prepared for use in the Infantry Officers Course to prepare future infantry platoon commanders in the additional skills and capabilities of future squad leaders who have completed this course of instruction. This training package will provide instruction to the lieutenants on how to conduct squad training that enhances the ability of the squad leader to hone his decision making skills while executing a greater role in personally training and tactically employing his assigned squad.

Battle Captain

The increasing significance of information technologies in combat operations centers places greater emphasis on battle watch captains to assimilate information and make rapid, correct decisions in an environment of uncertainty. This skill in maintaining situational awareness and recognizing emerging patterns requires special decision making skills.

Not every officer has the inherent skills to act effectively as a battle captain. Even those that do can improve with training and familiarity. During Urban Warrior, the Marine Corps Warfighting Lab will explore techniques for screening potential officers for the unique capabilities to act as a battle captain while developing a course of instruction to hone battle captain skills and decision making capabilities.

The intent is that all battle captains to be employed during Urban Warrior — at every level — will have successfully completed battle captain training.

Future warfare will involve greater information flows and place greater emphasis on battlewatch captains' abilities to assimilate information and make rapid, correct decisions in an environment of uncertainty. The Lab is developing a course of instruction to hone battle captain skills and decision-making capabilities.

Interoperability

It is unlikely that U.S. naval expeditionary forces will undertake unilateral operations in the future in the mid- to high-intensity level of war. While the likelihood of unilateral action in low-intensity operations, such as peace-keeping or humanitarian operations, is greater, it is probable that those operations will be conducted as part of a coalition or under the direction of the United Nations, NATO or other regional alliances. In addition, combined LOEs will be conducted in the U.K. involving Warfighting Lab personnel and equipment and Royal Marine/British Army units and a Royal Marine unit will participate in both the Urban Warrior culminating phase experiment and AWE.

The British Royal Marines and other coalition forces are participating in Urban Warrior experimentation.

To ensure future combined or coalition operations are prosecuted effectively, developing capabilities must continue to complement those of our allies. The results of experiments must at least provide our allies, so they have knowledge of experimental successes and setbacks. When mutual benefits are identified, we must encourage more positive interaction with our allies, must be encouraged and the active involvement of allies in the collaborative, coordinated and combined experiments must be pursued.

Our allies will not be persuaded to duplicate results in their forces. The aim is to give allies insight into the results of the Sea Dragon process so that they are aware of the future shape and direction of American naval expeditionary forces. By dovetailing respective capabilities and shortcomings with those of our allies the potential capabilities of combined or coalition naval expeditionary forces in the future will be maximized.

Urban Warrior Experiment Plan Summary

Urban Warrior will be conducted in two phases and along six experimental tracks. The first phase will be conducted primarily on the East Coast with II Marine Expeditionary Forces and will end in September 1998 with a Culminating Phase Experiment. The second phase will commence in October 1998 on the West Coast with I Marine Expeditionary Force and will terminate in an Advanced Warfighting Experiment on the West Coast during the Spring of 1999.

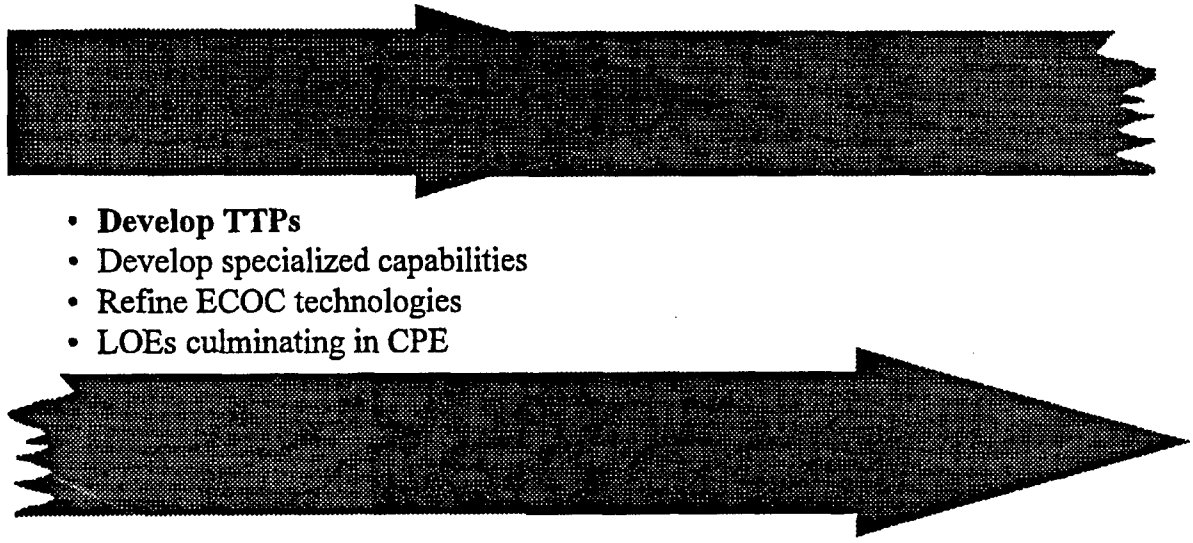
The first phase will focus on developing urban capabilities involving tactics, techniques and procedures (TTPs). Equipment and technology enhancements will be incorporated where feasible to significantly improve urban operating capabilities. In the process, particular attention will be placed on evaluating current Marine Corps training for urban combat and the development of a revised training program to be used in enhancing training for Marine operating forces.

The second phase will expand the first. It will apply the advanced urban warfare TTPs developed in Phase I to seabased urban operations using the refined ECOC. Limited objec-

tive experiments during this phase will be designed to further refine operational capabilities and to prepare for the Urban Warrior Advanced Warfighting Experiment in conjunction with Fleet Battle Experiments and the integration of Extended Littoral Battlespace Advanced Concepts Technology Demonstration (ELB ACTD) technologies.

The phasing of Urban Warrior is designed to define the focus of main effort. Urban Warrior LOEs and other related capability development initiatives will be conducted during both phases using East and West Coast operating forces and reservists. The ultimate objective of the phases are to effectively and efficiently develop the capabilities to be incorporated into the Urban Warrior AWE as potential enhancements for sea based expeditionary forces operating in the urban littoral.

Simultaneously with exploration of the TTPs during Phase I for urban operations and the incorporation of the refined ECOC during Phase II, the Marine Corps Warfighting Laboratory will develop warfighting capabilities in the following six experimental tracks: (1) C4I, (2) Seabasing, (3) Aviation, (4) Urban Fighting, (5) Fires and Targeting, and (6) Instrumentation. Note that these tracks have been discussed in detail in sections V, VI and VII and address both continued exploitation of *Hunter Warrior* experimentation as well as development of selected capabilities needed to support *Urban Warrior*.



Urban Warrior will be conducted in two phases with the emphasis shifting from the East Coast in Phase I to the West Coast in Phase II.

Implementing the Results of Experimentation

With the creation of the Marine Corps Warfighting Lab, experimentation has become one of the primary means for the identification of warfighting requirements within the Combat Development System (CDS).

Previously, requirements were primarily drafted as a result of lessons learned. Accordingly, requirement documents have tended to focus on improving current doctrine and warfighting capabilities rather than identifying opportunities for new capabilities as a result of emerging technologies and conceptual thinking. Although maintaining a system that carefully and effectively assimilates improvements is important, the rapid rate of change technologies invites an increased focus on identifying early potential opportunities for military capabilities. This effort requires close coordination between the various MCCDC staff sections, MARCORSYSCOM program managers, and the Lab *before, during* and *after* experimentation.

Before experimentation, coordination is required to identify capabilities to be developed in support of the warfighting concepts. Where possible, systems under development by MARCORSYSCOM that have the potential to deliver desired capabilities are identified as experimentation candidates and sufficient prototypes or surrogates acquired to support experimentation. Alternative commercial candidate systems, equipment and technologies may be required if there are no systems under program development. Where there is a probability that experimentation will yield a requirement, IPTs made up of MCCDC (WDID and Requirements), MARCORSYSCOM, and the Lab should be established.

During experimentation, close coordination is required between MCCDC staff sections to ensure the implications of experimentation are fully assessed and the impact on Doctrine, Organization, Training & Education, Equipment, and Support (DOTES) — as well as future Concepts — are captured and rapidly implemented within the CDS. Close coordination is required not only during major experimentation events such as AWEs, but also other limited and technical explorations conducted in preparation for AWEs.

After experimentation is completed, close coordination is required to implement the findings from the experimentation. These findings may include analytic data collected by the Lab, subjective assessments by official observers, and the specific recommendations of an integrated DOTES Assessment Team that should be on hand to carefully observe and assess the results of experimentation. In addition, post experiment coordination is required to determine the need for follow-on experimentation and implementation actions. Those actions need to complete follow-on assessment within the CDS leading to changes in the POM and DOTES.

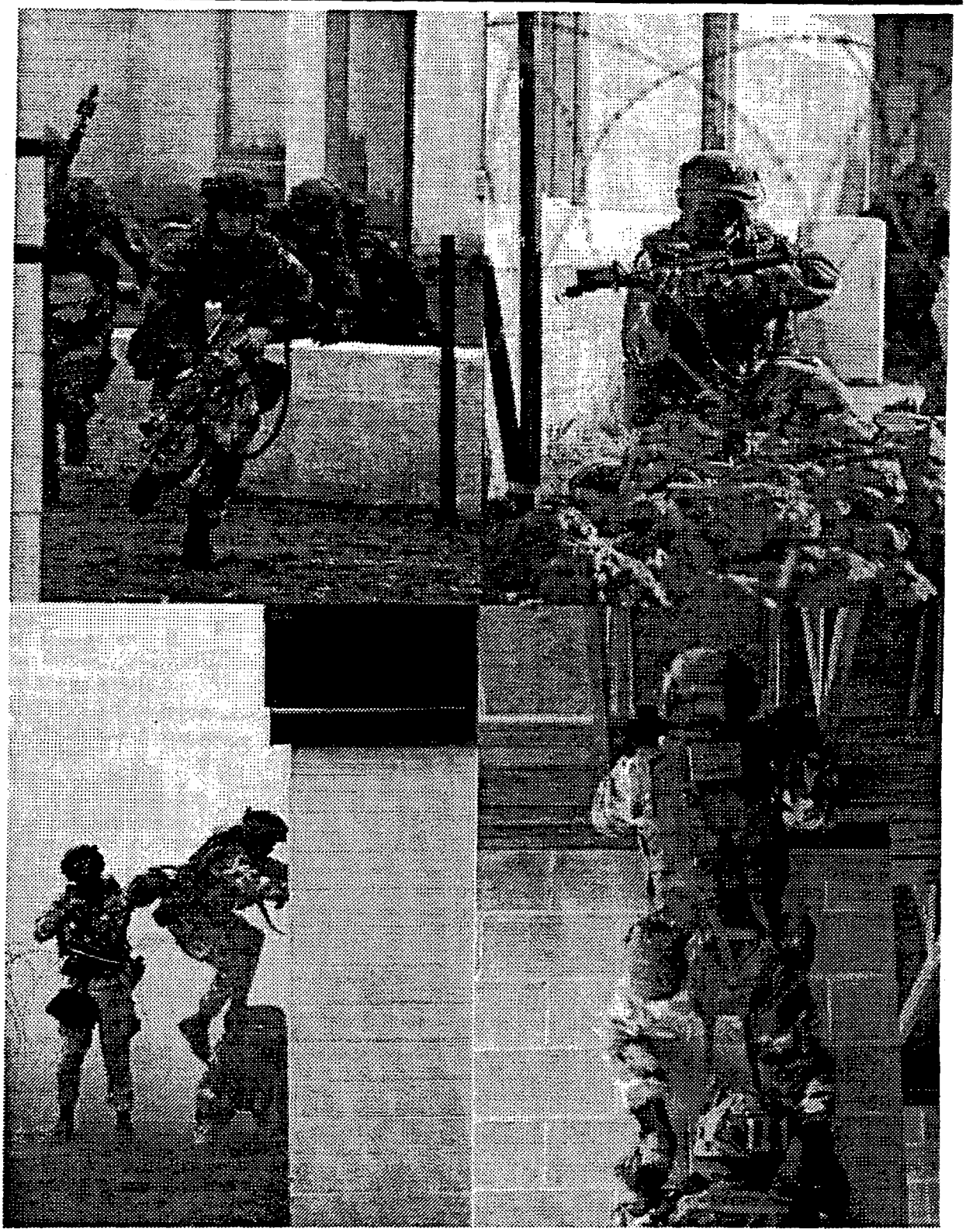
Advanced Warfighting Experiment (AWE)

The Urban Warrior AWE will be conducted on the West Coast by I MEF and 3d Fleet operating forces during March-April 1999 under the umbrella of the 1999 Kernel Blitz joint exercise. It will be sea based and will be conduced in a series of locations designed to experiment with a range of capabilities under a variety of urban conditions. Like *Hunter Warrior,* it will be conducted in coordination with a Fleet Battle Experiment. In addition, it will be used by the Extended Littoral Battlefield ACTD as a primary demonstration of their new technologies.

The following is a draft hypothesis for the AWE: ***Can we significantly increase the ability of forward afloat forces to execute simultaneous, non-contiguous operations in both the extended and constrained urban battlefields to include: (1) penetrating and operating in the dense urban battlefield, (2) operating in critical areas of the extended battlefield on the approaches surrounding dense urban areas, (3) dealing with weapons of mass destruction, and (4) seabasing the bulk of support capabilities including C4I, and sustainment.***

The AWE scenario will be based on current planning scenarios for I MEF and 3d Fleet forces and will be developed to explore the range of naval capabilities associated with a future naval expeditionary forces in the 2010 time frame. It will explore naval capabilities in a joint context but focus on potential naval operations as initial response to a regional crisis before a supporting joint infrastructure has been developed. Accordingly, it will focus on sea based capabilities associated with forward presence forces — ARG/MEU(SOC) and carrier battle group — with augmentation from early arriving forces such as the MPF and land based Marine aviation.

It may incorporate both live fire and force-on-force events — some of which may be off-set to ranges at MCAS Yuma or MCAGCC Twenty-nine Palms, California. Live fire events will be designed to explore the coordination of precision delivered indirect fires. Force-on-force events will have specific objectives and will involve the personnel playing the role of noncombatants. In addition, some phases will focus on the employment of non-lethal weapons, response to the employment of chemical or biological weapons, sea-based logistics delivery into the urban environment, sea-based tactical UAVs, expeditionary *first responder* medicine, and the use of COTS radios for reliable and secure tactical communications at the battalion level and below within an urban environment. All phases will have as a major goal the rapid and effective dissemination down to and between dispersed, independently operating small units as a primary enabler of opportunistic coordinated actions. The ultimate objective of the AWE is to explore advanced capabilities for naval expeditionary force operations in the urban environment and then to immediately exploit the experience of the AWE by exporting capabilities into operational experimentation in a deploying ARG/MEU(SOC) — beginning in the summer of 1999.



"Urban Warriors"

UNITED STATES MARINE CORPS
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IN REPLY REFER TO
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21 April 98

From: Commanding Officer, Marine Corps Warfighting Lab, Marine Corps Combat Development Command, 2042 Broadway Street, Suite 201, Quantico, VA 22134-5096
To: See Distribution

Subj: URBAN WARRIOR CONCEPTUAL EXPERIMENTAL FRAMEWORK , VERSION 1-5

1. In the last three years, experimentation has become the principal means for identifying future Marine Combat capabilities. The Sea Dragon experimentation process begins with an assessment of future context and what conditions may lie ahead. The Marine Corps Warfighting Lab translates that context into concepts for employing forces. In turn, the concepts are broken down into essential capabilities. These are the grist for the Urban Warrior series of experiments. Reflecting this logic, the Urban Warrior Conceptual Experimental Framework presents the urban warfare concepts and enabling capabilities that we believe should guide experiment-based development of naval expeditionary operations on the urban littoral.

2. A word on technology. As we prepare to embark on joint experimentation the premium on clear thinking and rigorous analysis grows. I purposely didn't mention it in the first paragraph, but if anything is certain about the future, it is that we will face a bewildering array of technology choices. Choosing intelligently demands an understanding of future context and concepts. These give us logical backboards against which to bounce various technology alternatives and make operationally sound choices.

4. The fifth revision of the Urban Warrior experimental framework has been reformatted to include photos and diagrams. It remains a draft. It may be updated yet again, based on the results of experimentation or to incorporate additional experimentation opportunities.

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Distribution:
Lists A&B

INTERNET DOCUMENT INFORMATION FORM

A . Report Title: Urban Warrior Conceptual Experimental Framework Version 1-5

B. DATE Report Downloaded From the Internet 8/31/98

C. Report's Point of Contact: (Name, Organization, Address, Office Symbol, & Ph #): **United States Marine Corps**
Marine Corps Warfighting Lab
Combat Development Command
Quantico, VA 22134-5096

D. Currently Applicable Classification Level: Unclassified

E. Distribution Statement A: Approved for Public Release

F. The foregoing information was compiled and provided by:
DTIC-OCA, Initials: UM **Preparation Date:** 8/31/98

The foregoing information should exactly correspond to the Title, Report Number, and the Date on the accompanying report document. If there are mismatches, or other questions, contact the above OCA Representative for resolution.

DOCUMENT 3

Current MOUT Doctrine and Its Adequacy for Today's Army

AD-A331772

June 1997

Army Command and General Staff College
Ft. Leavenworth, KS

CURRENT MOUT DOCTRINE AND ITS ADEQUACY FOR TODAY'S ARMY

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

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Fort Leavenworth, Kansas
1997

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	6 June 1997	Master's Thesis, 4 August 1996 - 6 June 1997

4. TITLE AND SUBTITLE
Current MOUT Doctrine And Its Adequacy For Today's Army

5. FUNDING NUMBERS

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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ATTN: ATZL-SWD-GD
Fort Leavenworth, Kansas 66027-1352

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/ MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/ MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/ AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited

12b. DISTRIBUTION CODE
A

13. ABSTRACT *(Maximum 200 words)*

This thesis examines the adequacy of current military operations on urbanized terrain (MOUT) doctrine for current and future Army operations at the battalion task force level. This study outlines Army MOUT doctrine's development including and since World War II and the current state of Army MOUT doctrine. This study applies four tests to determine the adequacy of MOUT doctrine: mission, threat, terrain and technology. Each test involves the general question of whether or not our current MOUT doctrine gives the task force commander the sufficient tools to conduct the range of operations he may execute today or in the near future. Additionally, the study uses two historical vignettes to as lessons learned and another means of testing MOUT doctine. This study concludes that current Army MOUT doctrine is inadequate for current and future operations. MOUT doctrine does not give the task force commander the tools he requires to conduct the missions, evaluate the threat, analyze the terrain, or use the technology available to him in an urban setting.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Military Operations on Urbanized Terrain: MOUT; Urban Warfare; Doctrine	73
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

CURRENT MOUT DOCTRINE AND ITS ADEQUACY FOR TODAY'S ARMY, by MAJ Phillip T. Nethery, USA, 71 pages.

This thesis examines the adequacy of current military operations on urbanized terrain (MOUT) doctrine for current and future Army operations at the battalion task force level. This study outlines Army MOUT doctrine's development including and since World War II and the current state of Army MOUT doctrine. This study applies four tests to determine the adequacy of MOUT doctrine: mission, threat, terrain and technology. Each test involves the general question of whether or not our current MOUT doctrine gives the task force commander the sufficient tools to conduct the range of operations he may execute today or in the near future. Additionally, the study uses two historical vignettes to as lessons learned and another means of testing MOUT doctine. This study concludes that current Army MOUT doctrine is inadequate for current and future operations. MOUT doctrine does not give the task force commander the tools he requires to conduct the missions, evaluate the threat, analyze the terrain, or use the technology available to him in an urban setting.

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CHAPTER 1

INTRODUCTION

Introduction

> The worst policy is to attack cities. Attack cities only when there is no alternative.
>
> Sun Tzu, The Art of War[1]

Sun Tzu summarized most modern soldiers' attitude toward urban combat. There is good reason for hesitance toward urban combat. Military operations on urbanized terrain (MOUT) are costly in terms of time, equipment, lives, and collateral damage. There is no guarantee of success and a small force in a city can hold a much larger force at bay for extended periods. Though most forces strive to avoid MOUT, each deployment or operation requires operations in urban areas to some degree.

United States Army doctrine is no different in addressing MOUT. "Tactical doctrine stresses that urban combat operations are conducted *only* when required and that built up areas are *isolated* and *bypassed* rather than risking a costly, time-consuming operation in this difficult environment."[2] Yet, Army forces conducted numerous MOUT operations in the recent past. Certainly, MOUT operations will be an integral part of future Army operations. Major Ralph Peters states that the "military unprepared for urban operations across a broad spectrum is unprepared for tomorrow."[3] The purpose of this study is to test the adequacy of current Army MOUT doctrine against recent, current, and future operations and to make recommendations based on the outcome of this test.

The Research Question

To meet the purpose of this study, this thesis will answer the following primary question: Is the Army's current MOUT doctrine adequate to meet current and future requirements?

In order to answer the primary question, this thesis will answer these secondary questions:

1. How does the current doctrine apply to military operations other than war (MOOTW)?

2. What have recent operations involving the United States or other countries shown about the adequacy of current American MOUT doctrine?

3. Is current MOUT doctrine adequate when compared to the range of environments encountered in recent, current, and future operations?

Background

Current Army MOUT outlines methods for fighting a singular threat in the European theater and is a continuation of the firepower based doctrine developed during World War I. One reason for questioning the adequacy of current MOUT doctrine is the age of the Army's doctrine manual on urban warfare, U.S. Army Field Manual 90-10, Military Operations on Urbanized Terrain (MOUT). The Army published this manual in 1979. Certainly, the age of a document does not automatically make it obsolete. With current technology and the world situation changing daily, however, it follows that a doctrine written almost twenty years ago requires examination. Additionally, the world's urban areas are growing rapidly. Communications and weapons technologies have changed several-fold since the late 1970s. Additionally, the United States no longer faces a unified threat in a European setting, but several diverse threats worldwide. The United States' involvement in

peacekeeping and other operations short of combat has increased greatly over the past five years as well. There are many compelling reasons for updating U.S. MOUT doctrine, but three are foremost: (1) the fall of the former Soviet Union, (2) lessons learned from recent operations in urbanized terrain, and (3) changes in U.S. military strategy and technology.

The world has changed in many ways since 1979. The most notable change in relation to U.S. military doctrine was the fall of the former Soviet Union. For forty years, U. S. strategy and military doctrine focused on the defense against and destruction of the Soviet Union and its allies. With that threat fragmented, the United States designed a military strategy that addressed the variety of threats the nation could face and operations it would likely conduct. There are still threats in the world, for example, Iraq that employ some form of Soviet doctrine. Others, like the factions found in Somalia, use other doctrines. Still others are not well-organized military threats at all, but require U.S. forces to operate in urban environments, such as during the assistance to victims of Hurricane Andrew or fighting terrorism. The Army's MOUT doctrine must adequately address each of these and other possibilities. Additionally, the MOUT doctrine must address operations in a wider range of environments and not restrict its treatment of terrain to a European setting.

Certainly, recent operations must yield ideas for updating the MOUT doctrine. Lessons learned from U.S. operations in Panama, Somalia, Haiti, and Bosnia all hold lessons that are applicable to future U.S. missions. The Army must incorporate these lessons into any revision of MOUT doctrine.

The President's A National Security Strategy of Engagement and Enlargement, developed after the end of the cold war, outlines the decision-making process behind the use of U.S. military forces. One category of the use of military forces is toward

humanitarian interests.[4] As the Army continues assisting in operations short of war and peacekeeping operations, and the operations continue to take place in settings like the streets of Port-au-Prince or Miami, it must have a MOUT doctrine that addresses these types of restrictive roles.

The Army can no longer restrict its MOUT doctrine to addressing a single Soviet threat fought in a European setting. MOUT doctrine must consider not only a range of potential threats, from conventional armies to terrorists, but also a range of environments, from the industrialized, advanced cities found in central Europe to the underdeveloped, primitive setting found in Mogadishu. Likewise, MOUT doctrine must also address levels of conflict ranging from peacekeeping and humanitarian operations where the rules of engagement are restrictive and consideration of the civilian population is of primary concern, to all-out combat where the civilian population has left the area of operations. This thesis will assess the adequacy of the current MOUT doctrine in light of these factors.

As much as the Army would like to avoid MOUT, it will conduct operations on urbanized terrain in future operations. The threat has expanded, the environment in which the Army plans to fight has changed, and the Army's role has expanded to include many forms of non-combat operations. Current MOUT doctrine must clearly and coherently address each of these issues.

Assumptions

The following assumptions are required in order to compete the research required for this study:

1. The operations used as a basis for this thesis are representative of the types of operations the Army will face in future operations and conflicts.

2. The adequacy of doctrine is measurable.

Definitions

The following are terms that are essential to this research study, arranged alphabetically:

Battlefield Operating Systems. The major functions performed by a force on the battlefield to successfully execute Army operations (battles and engagements) in order to accomplish military objectives directed by the operational commander; they include maneuver, fire support, air defense, command and control, intelligence, mobility and survivability, and combat service support.[5]

Built-Up Area. A concentration of structures, facilities, and population that form the economical and cultural focus for the surrounding area. The four categories include: large cities (population greater than 100,000), towns and small cities (population between 3,000 and 100,000), villages (population less than 3,000), and strip areas. Strip areas form links between villages and towns and run along lines of communication.[6]

Doctrine. Fundamental principles by which military forces guide their actions in support of national objectives. Doctrine is authoritative, but requires judgment in application. Doctrine must be rigid enough to provide steer specific operations and be flexible enough to apply to various situations.[7]

Hub Phenomenon. The hub of an urban pattern is the built-up area. For the defender, the hub may be a key part of his defense. The hub is an obstacle which blocks the attacker's advance. The hub or built-area may be bypassed if the surrounding terrain permits, opening the attacker to flank attacks. If the hub must be

attacked. MOUT operations must take place. The hub serves as the basis for urban patterns.[8]

Humanitarian Assistance. Assistance provided by DOD forces, as directed by appropriate authority, in the aftermath of natural or man-made disasters to help reduce conditions that present a serious threat to life and property. Assistance provided by U. S. forces is limited in scope and duration and is designed to supplement efforts of civilian authorities who have primary responsibility for providing such assistance.[9]

Intelligence Preparation of the Battlefield. A systematic and continuous process that describes the tactical environment and the effects of that environment on operations and what the enemy can accomplish.[10]

Linear Pattern. An urban pattern formed along straight lines, often a subelement of another pattern. It exists along valleys or rivers or connects other urban areas.[11]

Military Operations Other Than War (MOOTW or OOTW). Operations that encompass the use of military capabilities across the range of military operations short of war. These military actions can be applied to complement any combination of the other instruments of national power and occur before, during, and after war. [12]

Military Operations on Urbanized Terrain (MOUT). All military actions that are planned and conducted on a terrain complex where manmade construction impacts on the tactical operations available to the commander. [13]

Network Pattern. An urban pattern similar to the satellite but more extensive and complex. Often found in division or higher level sectors. Its satellites are far less dependent on the central hub than the satellite pattern. The network pattern's lines of communications have a rectangular shape rather than the linear shape found in the satellite pattern.[14]

Peacekeeping. Operations using military forces and/or civilian personnel, at the request of the parties to a dispute, to help supervise a cease-fire agreement and/or separate the parties.[15]

Pie Slice Pattern. Urban pattern characterized by the splitting of an urban area by dominant terrain features like rivers or roads so that the urban area resembles a sliced pie.[16]

Rules of Engagement (ROE). Directives issued by competent military authority that delineate the circumstances and limitations under which U. S. forces will initiate and/or continue combat engagement with other encountered forces.[17]

Satellite Pattern. This common urban pattern is characterized by a central hub and relatively dependent, dispersed, smaller built-up areas. It is usually found in brigade or division sectors and its lines of communications focus on the central hub. Its surrounding terrain is generally homogenous and its outlying satellites support the principal urban area.[18]

Tactics. The art and science of employing available means to win battles and engagements.[19]

Urban Terrain. Synonymous with built-up area.

War. A state of open and declared armed hostile conflict between political units such as states or nations; may be limited or general in nature.[20]

Limitations

The following factors are weaknesses associated with this study and are outside the researcher's control:

First is a lack of information about recent European operations. These operations may be too recent to yield a great deal of information. Additionally, the information on hand may be classified and thus difficult to attain or unavailable.

Second, because some operations were categorized as humanitarian or peacekeeping in nature and not actual combat, no information was gathered related to MOUT. U.S. peacekeeping operations in Bosnia are an example of this category of information.

Delimitations

The following factors constrain this study to assure its feasibility:

1. The study only examines conventional warfare. It does not include treatment of unconventional, special operations, or other types of operations the Army currently executes.

2. This thesis will use case studies of operations occurring within the past fifteen years. These operations will provide sufficient and comparable information for analysis while.

3. Finally, this study will examine the adequacy of MOUT doctrine at the battalion task force level and below.

Significance of the Study

Successful completion of this thesis will contribute to the Army in numerous ways. This study will serve as an assembly of research on modern MOUT actions. The historical vignettes include descriptions of the U.S. action in Somalia and the Russian urban fighting in Chechnya. Those desiring to study current MOUT operations and doctrine may use this as a starting point for their research. The extensive bibliography serves as a reference for those interested in MOUT. Next, the study will determine the

adequacy of current MOUT doctrine in relation to the missions facing the Army today. If this study finds that the doctrine is adequate, doctrine writers can solve more pertinent and relevant problems. If current MOUT doctrine is inadequate, this study will identify those inadequacies and make recommendations on the changes required to bring Army MOUT doctrine up to date. This thesis can significantly contribute to preparing the Army for current and future operations in urbanized terrain.

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[1]Sun Tzu, The Art of War trans. Samuel B. Griffith, (New York: Oxford University Press, 1963), 78.

[2]U. S. Army, Field Manual 90-10, Military Operations on Urbanized Terrain (MOUT), (Washington: Department of the Army, 1979), 1-2, 1-1.

[3]Ralph Peters, "Our Soldiers, Their Cities," Parameters (Spring 1996): 43.

[4]William J. Clinton, A National Security Strategy of Engagement and Enlargement (Washington, D.C.: GPO, 1996), 18.

[5]U.S. Army, Field Manual 100-5, Operations (Washington: Department of the Army, 1993), G1.

[6]U.S. Army, FM 90-10, 1-2, 1-3.

[7]U.S. Army, FM 100-5, G3.

[8]U.S. Army, FM 90-10, 1-6.

[9]U.S. Army, FM 100-5, G4.

[10]Ibid., G4.

[11]U.S. Army, FM 90-10, 1-8.

[12]The Joint Staff, Joint Publication 1-02, (Washington: OC, Inc., 1996), 265.

[13]U.S. Army, FM 90-10, i.

[14]Ibid., 1-7.

[15]U. S. Army, FM 100-5, G7.

[16]U. S. Army, FM 90-10, 1-8.

[17]U. S. Army, FM 100-5, G8.

[18]U. S. Army, FM 90-10, 1-7.

[19]U. S. Army, FM 100-5, G8.

[20]Ibid., G9.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter will serve three purposes. First, it will provide the reader with an overview of the state of current Army doctrinal literature relating to MOUT. Second, this chapter will give current Army MOUT doctrinal publications and give a limited overview of the evolution of MOUT doctrine since World War II. Finally, it will provide a synopsis of other publications discussing U.S. Army MOUT. These publications cover a wide variety of types and sources, ranging from journal articles to field manuals and The Army Times to the Department of the Army.

An abundance of sources provides a great deal of literature relating to Army MOUT doctrine. Additionally, many of these works are less than five years' old. This is mainly due to the renewed interest in MOUT doctrine within the military community. Recent lessons learned, the end of the cold war, and the increase in Operations Other Than War (OOTW) deployments involving the need to operate in urban areas without conducting combat operations caused this interest.

Doctrine

This portion of the study will examine current Army MOUT doctrine. To do so, the study will first briefly treat the evolution of MOUT doctrine since World War II, focusing on Field Manual 31-50, Combat in Fortified Areas. This treatment will discuss World War II MOUT doctrine, postwar doctrine and how this evolved into the

Army's current doctrine. Then, this section will examine the Army's key doctrinal publications, Field Manual 90-10, Military Operations on Urbanized Terrain (MOUT), and Field Manual 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas. Finally, this portion of this study will examine MOUT doctrine in the 71 series of field manuals, specifically FM 71-100, Division Operations; FM 71-3, The Armored and Mechanized Infantry Brigade; FM 71-2, The Tank and Mechanized Infantry Battalion Task Force; and FM 100-20, Military Operations in Low Intensity Conflict.

FM 31-50

The Army's doctrinal guide to MOUT during World War II was FM 31-50, Combat in Fortified Areas. Published for the first time in 1944, this manual outlined MOUT doctrine for use primarily during the war and also for periods after the war. The Army published this manual in anticipation of a great deal of urban combat associated with the invasion of Europe. Several points of the World War II version of FM 31-50 warrant examination for the purposes of this study.

FM 31-50, just like every other Army publication on MOUT doctrine, stresses bypassing built-up areas rather than fighting. Furthermore, the commander should only consider offensive operations as a last resort. The manual aptly pointed out that combat in urban areas gives the defender a decisive advantage, an advantage that the defender must weigh against the town's tactical value.[1]

As a result of the Army's reluctance to fight in urban areas during World War II, FM 31-50 orients almost entirely on how to conduct offensive operations. One must remember the offensive nature of American involvement in World War II. This nature drove FM 31-50's emphasis on the offense rather than the defense.

Fighting as a combined arms team in World War II was a relatively new concept. Though new, MOUT doctrine during that time reflected this combined arms approach. In offensive operations, FM 31-50 stressed fighting as a combined, synchronized force. Artillery and air support fired heavy preparatory fires into the built-up area, followed by the armor force encircling the town. Infantry troops, along with some armor then penetrated the defense and went from building to building to "mop up" any remaining resistance. The attacker used armor and infantry as a combined arms team.[2]

Army doctrine reflected the total war conditions experienced by the Army in World War II. The Army wrote FM 31-50 with those conditions in mind. The manual stressed using firepower to gain and advantage and thereby reduce or defeat the enemy. As a result, World War II MOUT doctrine did not consider collateral damage to city structures, the treatment of refugees and the civilian population, and the overall destruction resulting from such a doctrine.

Because of the offensive nature of World War II, MOUT doctrine in FM 31-50 gave very light treatment to defensive operations in built-up areas. It provided only a small amount of guidance on establishing a defense in a built-up area.

In summary, FM 31-50 is an offensively oriented publication, reflecting the fast paced, total war environment seen by the Army in World War II. It advocates bypassing built-up areas rather than expending resources, tying up forces and slowing down the tempo of the offensive. FM 31-50 bases its doctrine on using firepower and combined arms attacks to encircle the enemy, penetrate his defenses, and defeat him as quickly and decisively as possible.

FM 90-10

Army FM 90-10 is the first manual on MOUT doctrine since the 1964 version of FM 31-50. Published in 1979, FM 90-10 reflects the Army's experience during and since World War II, in the Korean and Vietnam conflicts, and other operations involving combat in urban areas.

Just as FM 31-50 reflected the combat environment facing the Army during and after World War II, FM 90-10 reflects the environment and conditions the Army anticipated during the cold war. One may examine these conditions by looking at the setting, threat, the intensity of conflict, and the doctrine described in FM 90-10.

The Army expected the next high intensity conflict to occur, like World War II, in Europe. Certainly, the Army anticipated and learned through its Korean and Vietnam experiences that there would be other threats in other locations, but Army doctrine after World War II focused on high intensity conflict in Europe. In classifying terrain and the types of urban areas expected in MOUT, FM 90-10 uses an entirely central European setting. FM 90-10 goes as far as to use German towns in its description and examples of urban environments.[3] It uses several means to describe terrain. The first is to classify the types of built-up areas, using Large Cities, Towns and Small Cities, Villages, and Strip Areas. It also describes the different patterns encountered in European cities and the effects of those patterns on operations.[4]

Though the settings described in FMs 31-50 and 90-10 remained the same, the threat changed after World War II. The United States' military strategy centered on defeating the forces of the Soviet Union and Warsaw Pact countries. As a result, the Army wrote all of its doctrine, including FM 90-10, directed toward the defeat of this threat. FM 90-10 gives detailed descriptions of the Soviet doctrine for MOUT in the offense and defense.

Since FM 90-10 assumed that the next war would be in Europe and with the Soviet Union, it followed that that conflict would be high intensity in nature. This meant that the Army continued the firepower-based MOUT doctrine outlined in FM 31-50. This doctrine maximizes the use of overwhelming firepower to defeat an enemy and gives little or no consideration to the effects of such doctrine on infrastructure or the civilian population.

FM 90-10 gives extensive coverage to Army MOUT doctrine, fully describing both offensive and defensive operations. Additionally, it covers combat support and service support operations and considerations in urban environments. First, a discussion of offensive operations.

The potential attacker's first and most important consideration in the offense is the tactical value of attacking versus bypassing the urban area. The attacker should always bypass when possible. FM 90-10 states that there are three purposes for attacks into built-up areas. Those purposes are to gain a critical objective, to rupture the defense, and to facilitate future operations.[5] FM 90-10 then divides offensive operations into two operations: hasty and deliberate attack. Of the two, the attacker only conducts a deliberate attack when it is absolutely necessary. A deliberate attack is very resource-intensive. It requires the attacker to devote a large amount of time, personnel, and resources to the planning and execution of the operation. Its potential for success is indirectly related to the amount of time taken to plan the operation; the enemy has additional time to prepare his defenses. Very similar to FM 31-50, FM 90-10 divides the deliberate attack into three phases: isolation of the objective, assault to rupture the defense, and systematic clearance of the urban area. The hasty attack provides the attacker the advantage of the ability to attack the defender before his defenses are fully established. Hasty attacks enable the attacker to find weak spots or

gaps, fix the enemy or exploit success.[6] FM 90-10 describes fully integrated, combined arms offensive operations.

Though FM 90-10 gives more consideration to defensive operations than its predecessors, most of the principles it describes are not unique to MOUT, but could be applied to any defensive operation. It divides its description of defensive doctrine into covering force, main battle, and rear area operations.[7] Like offensive operations, MOUT defense in FM 90-10 is a combined arms effort.

> If it is necessary to fight within a built-up area, the role of infantry supported by other arms becomes dominant. Field and air defense artillery, air cavalry, and attack helicopters are employed throughout the battle area to maximize the combined arms team's effectiveness, multiply its combat power, and enhance its survivability.[8]

FM 90-10 has several significant omissions. First, it does not address operations short of war. Written while the cold war was in full swing, FM 90-10's writers never envisioned the end of the Soviet Union and the subsequent involvement of the Army in numerous MOUT other than war. Second, FM 90-10 does not consider the range of terrain the Army currently faces. Its narrow scope only treats the European environment and fails to consider any other types of terrain or built-up areas. Finally, it does not address the technology available to today's Army. Specifically, the manual does not treat the use of the Bradley Fighting Vehicle, guided munitions, navigation, and communication equipment, and non-lethal weapons.

In summary, FM 90-10 established MOUT doctrine for the cold war Army. It describes urban combat in a European environment, with the Soviet Union in a high intensity conflict. Its doctrine advocates offensive operations only when absolutely necessary, using a combined arms team. It describes defensive doctrine in more detail than its predecessor, but does not offer much in defensive doctrine unique to MOUT. FM 90-10 omits several items now part of today's Army. Specifically, it omits

operations short of war, various terrain, and several technological innovations available for use.

FM 90-10-1

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas, published in May 1993, is the companion manual to FM 90-10. It establishes in great detail how infantrymen are to conduct MOUT. While FM 90-10-1 is a 'how-to' manual in many ways, it not only implements doctrinal principles outlined in FM 90--10, but supplements FM 90-10 by establishing doctrine in areas where FM 90-10 does not. The Infantry School wrote FM 90-10-1 for infantrymen, while the Combined Arms Center at Fort Leavenworth wrote FM 90-10 for the entire Army. This section will examine what FM 90-10-1 includes and excludes.

FM 90-10-1 gives a varied analysis and description of a wide range of urban setting. Unlike FM 90-10, FM 90-10-1 does not restrict its discussion of urban terrain to a European setting. FM 90-10-1 gives a brief overview of the similarities and dissimilarities between urban areas found in different regions of the world, but this discussion does not address the specific types of construction and city layout found in each geographic region described in the manual.[9] The manual devotes an appendix to discussion of the various building types found in urban settings.

This manual gives a great deal of detail on the conduct of MOUT. It gives not only offensive and defensive operations, but further breaks those categories down from the battalion to the platoon level. Additionally, as the title implies, FM 90-10-1 gives detailed instruction on individual techniques on MOUT, ranging from individual movement techniques to camouflage.

Due to its recent publication, FM 90-10-1 integrates the use of most of the technology available today. It treats the use of the Bradley Fighting Vehicle in the offense and defensive operations. Additionally, it addresses the use of the Mark 19 and 120 millimeter tank gun.[10]

FM 90-10-1 devotes a chapter to urban analysis. This chapter gives a great deal of detail on terrain, weather, and threat analysis in MOUT. The terrain analysis covers types of construction for all regions of the world. FM 90-10-1 does not restrict its threat analysis to a "how they fight" analysis of one type of threat, but briefly covers a range of potential enemies, including insurgents, guerrillas, and terrorists.

This manual attempts to treat MOUT in low intensity situations in its Appendix G, "Military Operations in Urban Terrain Under Restrictive Conditions." This appendix covers restrictive rules of engagement in MOUT and conducts an analysis of MOUT in restrictive conditions as it relates to fire support, air defense, command and control, engineers, and intelligence.[11]

FM 90-10-1 is a well-written manual that covers a wide range of MOUT topics, many which are not covered in FM 90-10. It provides a basis for individual techniques for MOUT while also addressing unit doctrine up to the battalion task force level. And, though it discusses more technological, terrain, and threat issues than FM 90-10, it is still deficient in treating operations short of war, full threat evaluation and integration, the use of current technology, and terrain analysis.

71 Series of Field Manuals

This study examines three 71 series manuals: FM 71-100, Division Operations (1996); FM 71-3, The Armored and Mechanized Infantry Brigade (1996); and FM 71-

2, The Tank and Mechanized Infantry Battalion Task Force (1988). Of these three manuals, only FM 71-2 makes any mention of MOUT doctrine.

FM 71-2, published in 1988, has two short passages relating to MOUT doctrine. The first categorizes urban area operations as a special operating environment and is simply a one-paragraph summary of FM 90-10 tailored to use at battalion level.[12] FM 71-2's second mention of MOUT doctrine is in defensive operations. The offensive operations section does not mention MOUT. Like FM 90-10, most of the principles outlined in FM 71-2's treatment of MOUT in the defense apply to any defensive operation. Unlike FM 90-10, FM 71-2 gives some specific, but short techniques for employing tanks with Bradley Fighting Vehicles and tailors its limited comments to the battalion level.

FM 100-20

FM 100-20, Military Operations in Low Intensity Conflict, published jointly by the Army and Air Force in 1990 briefly treats urban area operations. This manual stresses the terrorist and insurgent threats and outlines the use of restrictive rules of engagement in order to minimize collateral damage and to garner the support of the local civilian population. It advocates the use of civil affairs and psychological operations teams as an integral part of success in low intensity MOUT.[13]

Student Products

This section of chapter two will examine the contribution to the study of MOUT doctrine to four Command and General Staff College products relating to MOUT. The scope of this examination will include three 1995 monographs and a Master of Military Art and Science (MMAS) thesis written in 1994. First, this study will consider the three monographs.

All three monographs are timely and examine MOUT from a current perspective. All three recommend that the Army stop avoiding MOUT and embrace the idea that MOUT is a fact of conducting most future operations. Given the idea that MOUT is an inevitability in future operations, each monograph makes specific conclusions relating to changing how the Army conducts MOUT. Each monograph makes interesting recommendations, but all are deficient in the depth of their recommendations. Specifically, none make recommendations on how to change MOUT in relations to the use of technology, different threats, or in operations short of war.

"MOUT Art Operational Planning Considerations for MOUT" by Major Charles A. Preysler, outlines several key points. First, the Army must accept urban combat in the future as inevitable and plan accordingly. Second, in planning, leaders must understand the urban environment and the tension created between destruction, cost, and duration. Third, planners must focus on operational objectives in order to ensure timely success. Fourth and finally, he determines that current MOUT doctrine is insufficient and inadequate because of its age. He recommends a full revision of FM 90-10 "to bring it in line with current U.S. doctrine." Major Preysler's recommendations focus on adding operational planning considerations to MOUT doctrine, including differing terrain, threat, and leveraging modern technology in warfare.[14]

Major Richard M. Francey, Jr., wrote "The Urban Anatomy: The Fundamentals of a City." Major Francey contends that current MOUT doctrine is not adequate for future operations based on two main reasons. The first reason is that the doctrine's focus in incorrect. The Army's MOUT doctrine, as found in FM 90-10 is too tactically oriented and the Army should revise it to give it a more operational focus. Major

Francey also states the Army's MOUT doctrine should change its terrain focus from a European one to a more broad range of terrain. He recommends that MOUT doctrine be revised to reflect an operational perspective, discuss the aspects of normalcy and legitimacy during MOUT, and should examine the MOUT environment as a system rather than simply terrain.

"Future Combat in Urban Terrain: Is FM 90-10 Still Relevant?" by Major Steve P. Goligowski concludes that MOUT training is of utmost importance to success in MOUT. Second, he concludes that current MOUT doctrine is insufficient and requires change. Specifically, Major Goligowski recommends that Army leaders embrace MOUT as inevitable in future operations. Following that understanding, he contends that Army leaders should update MOUT doctrine, but he gives no specific recommendations for changes. Next, the Army should train MOUT, reflecting the new doctrine in the Training and Doctrine Command (TRADOC) schools system. Finally, with new MOUT doctrine in place and TRADOC teaching soldiers the new doctrine, the Army should examine current organizational structures and weapons systems to ensure it has the right organizations and weapons to meet MOUT challenges.

"Sufficiency of Doctrine for the Use of Armor in Military Operations on Urban Terrain" by Major David B. Hain is a MMAS thesis. Major Hain also concludes that current MOUT doctrine is inadequate for the proper use of armor in an urban environment. Major Hain conclusions result from the fact that Army MOUT doctrine does not provide the armor platoon, company, or battalion commander implementing doctrine to participate in all of operations a unit might conduct in an urban environment.[15]

Periodicals and Books

Numerous periodicals and books discuss MOUT. The periodicals discuss mainly two areas: lessons learned about MOUT and the application of those lessons, and analyses of battles involving MOUT. All periodical works agree that current MOUT doctrine is inadequate and requires changing. The books treating MOUT fit into two broad categories: analyses of battles involving MOUT or MOUT as it relates to a specific aspect, like terrain. The books relating to MOUT make no specific recommendations regarding current Army MOUT doctrine.

Summary

This chapter provided the reader with an overview of the state of current Army doctrinal literature relating to MOUT. To do so, this chapter familiarized the reader with current Army MOUT doctrinal publications, and gave the reader an overview of the evolution of MOUT doctrine since World War II, and finally, provided a synopsis of other publications treating U.S. Army MOUT doctrine.

FM 31-50 was the Army's first attempt at establishing MOUT doctrine. It contained an offensively orientated doctrine, written to meet the needs of the Army in World War II. FM 91-10, the Army

' current MOUT manual grew from the Army's World War II, Korea, and Vietnam experience to enable the Army to fight and win against the Soviets in Europe. FM 90-10-1 complements FM 90-10 as a 'how to' MOUT manual and also provides doctrine in areas where FM 90-10 is deficient. Both manuals are relatively old and only provide firepower-based solutions for the commander. Most popular and current works agree that the Army's current MOUT doctrine is deficient and requires updating.

[1]U.S. Army, Field Manual 31-50, Combat in Fortified and Built Up Areas (Washington: Department of the Army, 1944): 77.

[2]Ibid., 79.

[3]U.S. Army, Field Manual 90-10, Military Operations on Urbanized Terrain (MOUT) (Washington: Department of the Army, 1979), 1-2.

[4]Ibid., 1-2-1-9.

[5]Ibid., 2-8.

[6]Ibid., 2-13-2-14.

[7]Ibid., 3-18.

[8]Ibid., 3-15.

[9]Ibid., 2-1.

[10]Ibid., B-1.

[11]Ibid., G1.

[12]U.S. Army, Field Manual 71-2, The Tank and Mechanized Infantry Battalion Task Force (Washington: Department of the Army, 1988): 1-14.

[13]U.S. Army, Field Manual 100-20, Military Operations in Low Intensity Conflict (Washington: Department of the Army, 1990): E9.

[14]Charles A. Preysler, "MOUT Art: Operational Planning Considerations for MOUT (SAMS Monograph, U.S. Army Command and General Staff College, 1994): 44.

[15]David A. Hain, "Sufficiency of Doctrine for the use of Armor in Military Operations on Urban Terrain" (MMAS Thesis, U.S. Army Command and General Staff College, 1994), 111.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter will outline the methodology used to answer the primary research question: Is the Army's current MOUT doctrine adequate to meet current and future requirements? To answer the primary question, this study will determine the presence and evaluate the adequacy of present Army MOUT doctrine. This study will restrict tests for the adequacy of MOUT doctrine to the manuals available and pertinent to the battalion task force commander for use in MOUT operations. This study includes the following manuals for analysis: FM 90-10, Military Operations on Urbanized Terrain (MOUT); FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas; FM 71-3, The Armored and Mechanized Infantry Brigade; and FM 71-2, The Tank and Mechanized Infantry Battalion Task Force.

A researcher may use numerous military systems as valid analytical tools to examine doctrine or other military questions. Those systems include the battlefield operating systems, tenets of Army operations, and the principles of war. This study uses a variation of the leaders' mission, enemy, troops, terrain and weather, and time available or METT-T analysis as a tool to evaluate the adequacy of MOUT doctrine. The four tools used by this study are mission, threat, terrain, and technology. These tools resemble the METT-T analysis, while allowing tailoring to reflect the situation in the Army today.

Mission

FM 101-5-1 describes mission as "the primary task assigned to an individual, unit, or force. It usually contains the elements of who, what, when, where, and the reason, but seldom specifies how."[1] Tacticians often interest themselves specifically in the what or task and the why or purpose in relation to warfighting. This study examines the what or task to be performed by the combat unit in MOUT.

This tool allows us to evaluate doctrine for adequacy across the range of missions a unit might conduct in an urban environment. It includes mission involving combat operations and operations other than war.

Two sources contribute the specific components of this tool. Those components are FM 100-15, Corps Operations and FM 71-2, The Tank and Mechanized Infantry Battalion. FM 100-15 might not seem like a suitable choice for this test, but this manual contains the missions a unit might conduct in an operation other than war. Those missions are: arms control, attacks and raids, combatting terrorism, disaster relief, nation assistance and support to counterinsurgency, peace operations, show of force, support to civil authorities, and support to counterdrug operations.[2] Certainly, no battalion task force would execute any of these missions alone, but could easily be expected to participate as a part of a corps, division, or other force in one or many of these operations other than war.

FM 71-2 contributes the combat operations for the mission analytical tool. The offensive operations are hasty attack, deliberate attack, and attack of a strongpoint. The defensive operations are defense of a sector, defense of a battle position, and defense of a strongpoint.

The minimum criteria for the mission area analysis is the presence of an applicable MOUT doctrine for the missions listed above. If the publications do not contain MOUT doctrine for all of the missions listed, then the doctrine is inadequate.

Threat

The METT-T model uses the enemy label to account for the opposing force in a military operation. The term enemy refers to "a hostile power or force, such as a nation."[3] This definition is too restrictive. It suggests that another force must be a nation or represent some legitimate body such as a goverment in order to be a hostile force. Threat, or "one that is regarded as a possible danger, menace" is far more suitable in describing the forces that the Army faces in modern operations. This definition covers a hostile power or force in the form of a nation, while also describing less organized, less legitimate opponents. Some argue that soldiers' use of threat makes the range of possible opponents far too broad to manage. This definition simply reflects diversity of the forces and opponents facing the United States today.

This study will use threat as a tool to evaluate the adequacy of MOUT doctrine by addressing the following question: Does Army MOUT doctrine assist the commander in identifying all of the potential dangers or menaces facing his force?

The minimum criteria for adequacy of MOUT threat doctrine is the presence of doctrine for both conventional and unconventional threats. A conventional threat refers to a force sponsored and fielded by a constituted political unit like a state or nation.[4] Unconventional threat consists of two subsets: insurgents and terrorists. An insurgent threat is an organized group aimed at the overthrow of a constituted government using subversion and armed conflict.[5] A terrorist threat uses unlawful threats or the actual use of force against people or property to coerce, intimidate

governments or societies to achieve political, religious, or ideological objectives. Terrorists may be nonstate supported, state supported or state directed.[6]

Terrain

FM 101-5-1 defines terrain, including weather, as "information about how about vegetation, soil type, hydrology, climatic conditions, and light data is analyzed to determine the impact the environment can have on current and future operations for both enemy and friendly operations."[7] Additionally, soldiers use the military aspects of terrain, like observation, cover, obstacles, concealment, key terrain, and avenues of approach to analyze terrain. Too often soldiers use these tools, useful in a rural environment, to evaluate an urban environment. This application is valuable, but in combat and operations other than war, the commander often requires a deeper understanding of the urban environment. This understanding must include the social, economical, and political value or lack of value of an objective. This study seeks to broaden the definition of terrain to support the mission or specifically, the purpose, for which the unit is conducting the operation on urban terrain. It will do so by applying the following question: Does Army MOUT doctrine provide the commander a means to identify the tactical or operational significance of the objective?

The minimum criteria for this test covers two areas. First, whether or not MOUT doctrine gives the commander the ability to do the traditional terrain analysis-observation, cover and concealment, obstacles, key terrain, and avenues of approach (OCOKA). Second, whether or not MOUT doctrine give the commander the ability to understand key systems within the urban environment and their operational value to the him and the threat. Those systems are utilities, communications, transportation, waste management, civil order, and government.

Technology

Technology or the application of science to commercial[8] or in this case military objectives changes daily. The United States Army has some of the most advanced technology in the world. With the openess of today's global markets, many threats have the same or similar technology available to them. This is more true in the areas of communications, the media, computers, and navigation than in weapons and vehicle systems. Commonly available communications systems such as cell phones significantly change both the commander's ability to communicate and contribute to an information advantage. Global innovations and the availability of the Internet give everyone but the poorest access to a great deal of information. Guided munitions, along with the global, instant reach of the media combined to give the public the perception of the cleanliness of combat. Given the great potential for casualties in an urban setting, friendly or threat units may use this instant and close-up view of the fighting to his advantage. The MOUT commander must gain an understanding and ability to use these systems as effectively as he might a rifle platoon or company, especially in operations short of war. Because of the importance to success in any operation, especially MOUT, this study uses technology as one of its evaluative tools in examining MOUT doctrine. It does so by answering the following question in relation to the Army's MOUT doctrine: Does the MOUT doctrine give the commander the means to employ the weapons technology and use the information systems available to him while countering the technology available to his opponent?

The minimum criteria for adequacy in evaluating the doctrinal treatment of the use of technology covers two areas. First, whether or not MOUT doctrine allows the commander to apply a firepower based solution to the mission he must conduct.

Second, is whether or not MOUT doctrine gives the commander the ability to apply non firepower based solutions to a situation.

This study will compare the MOUT doctrine explained in the field manuals listed above to the four analytical tools and their components. The resulting comparison will indicate the adequacy of current MOUT doctrine and provide results on which conclusions can be drawn and recommendations made about the MOUT doctrine.

The second tool used in this thesis' methodology is the use of historical vignettes of MOUT battles. The battles in Chechnya and Mogadishu serve several valuable purposes. First, in addition to their presentation of the facts of a MOUT battle, this study will analyze each the lessons learned from the battle. The purpose of that analysis is to assist the reader in evaluating the status of MOUT doctrine. Additionally, historical vignettes provide the reader with a broader perspective of military operations than might otherwise be gained through a doctrinal review. Next, the majority of Army doctrine, tactics, techniques, and procedures is developed from a similar process. Finally, this study will analyze each battle using mission, threat, terrain and technology. Those responsible for a particular area start with an existing document, like FM 90-10. They then use accumulated experiences to update and make changes to that document. Finally, this study will analyze the historical vignettes against the mission, threat, terrain and technology tools to provide additional basis for conclusions and recommendations.

Strengths and Weaknesses

This study's analytical process has several inherent strengths. The first strength is consistency. The researcher may apply this process across a range of types of

operations as well as at different levels of warfare, from the platoon to the Army level. Validity is this process' second strength. The study's process of examination of military history is widely accepted and used by the military community to examine the adequacy of doctrine.[9] Additionally, recent experiences indicate that urban operations will not be incidental, but an integral part of military operations as the world continues to urbanize and the Army continues its force projection stance. The results of these tests yield sound results. Next, the study's tools are acceptable and familiar to the military community. Furthermore, the tools are integral parts of the military decision-making process and a part of each military operation. Finally, the tools used in this process are rigorous. The scope of the test is broad enough to yield well-founded results, but at the same time, not too cumbersome.

The main weakness associated with this type of analytical tool is the potential difficulty in measuring some of the individual tools. If MOUT doctrine addresses the majority of the offensive operations conducted by a battalion task force in urban terrain, then the doctrine is adequate. In this study, MOUT doctrine must meet the minimum standards established for each of the analytical tools, otherwise it is inadequate. These tools represent the pertinent issues facing the Army and are all essential for success in an urban environment, operating throughout the spectrum of conflict, including operations other than war.

Conclusions may be drawn from this analytical process. Foremost, the process discusses the adequacy of MOUT doctrine when compared to the current military environment, outlined using mission, threat, terrain, and technology. From this test of adequacy, the strengths and deficiencies in current MOUT doctrine may be identified. Recommendations may be made from the strengths and weaknesses on the actions

required to maintain the strengths of the current doctrine, while correcting the problems with Army MOUT doctrine. The historical case studies may be used to derive lessons learned from various MOUT operations, covering a range of missions, threats, terrain, and use of technology.

Summary

Many options are available in selecting analytical tools to evaluate Army doctrine. This study will evaluate Army MOUT doctrine using a variation of the soldiers' METT-T analysis. That variation includes the use of mission, threat, terrain, and technology as categories. The study will also evaluate two recent MOUT cases against the mission, threat, terrain, and technology model. The resulting analysis will allow the researcher to draw conclusions and then make recommendations relating to current MOUT doctrine. Though there are potential weaknesses associated with using this type of analytical analysis, the weaknesses do not threaten the integrity or validity of the analysis.

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[1]U. S. Army, FM 101-5-1, Operational Terms and Symbols (Washington: Department of the Army, 1985), 1-47.

[2]U.S. Army, FM 100-15, Corps Operations (Washington: Department of the Army, 1996), 9-5.

[3]The American Heritage Dictionary, rev. ed. (1992) s.v. "enemy."

[4]U.S. Army, FM 100-5, Operations (Washington: Department of the Army, 1993), G-9.

[5]U.S. Army, FM 100-20, Military Operations in Low Intensity Conflict (Washington: Department of the Army, 1990), G4.

[6]Ibid., 3-1.

[7]U.S. Army, FM 101-5-1, Operational Terms and Symbols (Washington: Department of the Army, 1985), 1-47.

[8]The American Heritage Dictionary, rev. ed. (1992) s.v. "technology."

[9]U.S. Army, Pamphlet 20-200, The Writing of American Military History (Washington: Department of the Army, 1956), 11.

CHAPTER 4

ANALYSIS

Introduction

This chapter will present, analyze and interpret the information produced by the methodology outlined in Chapter 3. It will provide the information to answer the primary question: Is the Army's current MOUT doctrine adequate to meet current and future requirements? This study will examine two brief historical vignettes and then analyze the current MOUT doctrine based on the criteria of mission, threat, terrain and technology. To accomplish this analysis, the study divides the analysis into two sections.

Section I analyzes current MOUT doctrine as offered in the following Army publications: FM 90-10, Military Operations on Urbanized Terrain (MOUT); FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas; FM 71-3, The Armored and Mechanized Infantry Brigade; and FM 71-2, The Tank and Mechanized Infantry Battalion Task Force. The study conducts this analysis using the tools outlined in Chapter 3. It compares the doctrine found in the manuals listed above against the tools listed in Chapter 3. Those tools include an analysis of potential missions a battalion might conduct in an urban setting, an examination of the doctrinal treatment of the various threats a battalion might face, an examination of what tools the doctrine gives the commander and his staff to analyze urban terrain, and finally, a review of the use of available modern technology in MOUT fighting.

The second section examines two historical vignettes and how they relate to current MOUT doctrine. Both vignettes are valuable because they offer a range of missions covering a variety of terrain and varying situations. Additionally, the study will examine each case in relation to the mission, threat, terrain and technology model. The vignettes include and examination of the Russian MOUT fighting in Chechnya in 1994 and the United States Army urban operation in Mogadishu, Somalia in 1993.

These historical vignettes provide the reader with insight about the realities of urban combat in the 1990s. Russian fighting in Grozny is pertinent because it shows, among other lessons, the effect of a firepower-based doctrine applied in to a modern, European-style environment. American fighting in Mogadishu holds several lessons for the MOUT student. Foremost, the potential for disaster in an operation short of war with limited rules of engagement and an unconventional enemy bent on defeating a force.

Doctrinal Analysis

Mission

This section will compare Army MOUT doctrine and its treatment of the various missions possibly facing a battalion task force in current and future urban operations. Though a battalion task force might not conduct all of these missions as an autonomous entity, the battalion fully be expected to participate in all of these missions as a part of a larger force.

Offensive Operations

The missions included in the analysis of doctrine for offensive operations include: hasty attack, deliberate attack, attack of a strongpoint, and attacks and raids.

This study will compare each of these missions to the doctrine outlined in the following manuals.

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

FM 90-10 gives an excellent overview of offensive operations at the battalion task force level. It does so through the use of three special situations describing three different offensive operations.

The first special situation describes the battalion task force conducting a hasty attack of an urban area. The situation describes the operation using the commander's narrative of how he expects to fight the battle. The situation covers the concept of the operation and describes the use of all of the battlefield operating systems and their role in the hasty attack. The situation stresses command and control, especially the control measures used in the attack.

FM 90-10's second special situation describes attacking to gain a foothold. Though the manual does not specifically refer to it as a deliberate attack, this operation resembles a deliberate attack. Like the first special situation, this situation describes the commander's actions, the actions of the specific battlefield operating systems, and the control measured used in the operation.

FM 90-10 does not address the doctrine supporting a battalion task force's attack of a strongpoint or attacks and raids in an urban environment. A task force can expect to conduct each of these operations in an urban environment.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

FM 90-10-1 devotes a little more than a paragraph to the conduct of a hasty attack in an urban area. Its coverage does not give the commander the tools he needs to conduct the operation.

FM 90-10-1 addresses the deliberate attack in more detail than the hasty attack. It covers the steps involved in the operation, including reconnoiter of the objective, movement to the objective, securing a foothold, and clearance of a built up area.

This manual does not specifically address the attack of a strongpoint, or urban attacks and raids. It does, however, treat how a company team might attack an enemy outpost and key terrain as a part of a battalion task force.

FM 71-3, The Armored and Mechanized Infantry Brigade

Though this manual covers offensive operations at the brigade level, it does does not mention offensive operations on urbanized terrain. Furthermore, it does not give any information on urban combat of any type.

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

FM 71-2 does not address hasty or deliberate attacks, attack on a strongpoint, or attacks and raids in urban environments. Its treatment of operations on urban terrain are limited to generalities about the conditions in urban settings. FM 71-2 refers the reader to FM 90-10 for guidance on operations in urban terrain.

Defensive Operations

The missions included in the analysis of doctrine for defensive operations are defense of a sector, defense of a battle position, and defense of a strongpoint. A

battalion task force may conduct these missions independently, or as a part of a larger force.

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

FM 90-10's means of discussing defensive operations at the task force level uses one situation. Though the manual refers to it as a defense of a battle area, it is nothing more than the defense of a battle position. It outlines the defense of a battle position by using the commander's spoken guidance as to how he intends to conduct the defense. Similar to its coverage of offensive operations, the manual's description of defense of a battle position stresses the employment of the battlefield operating systems, command and control, the concept of the operation, and control measures used in this type of defense. FM 90-10 does not address the urban defense of a sector or strongpoint.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

This manual devotes four pages to defensive operations at the battalion task force level. It covers defense in sector. FM 90-10-1's treatment of defense in sector covers the employment of forces in the sector, maneuver, control measures, fire support and mobility and countermobility. It does not cover these topics in depth and neglects the other battlefield operating systems entirely.

FM 90-10-1 does not specifically cover defense of a battle position or defense of a strongpoint. The manual does, however, treat the defense of a village in a manner closely resembling that of a strongpoint. It goes so far as to state that the battalion with a village in their sector could "incorporate the village as a strongpoint in its

defense."[1] The manual's discussion of defense of a village is short, covering employment of major weapon systems, security, and mobility/countermobility.

FM 71-3, The Armored and Mechanized Infantry Brigade

Though this manual covers defensive operations at the brigade level, it does does not mention defensive operations on urbanized terrain. Furthermore, it does not give any information on urban combat of any type.

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

This manual devotes two pages to battalion task force defensive operations in urban terrain, one of which is a diagram depicting a typical task force sector defense. The manual covers general topics like the amount of terrain a task force will defend, the types of maneuver a task force uses in an urban defense, employment of major weapon systems, and effects of terrain on friendly and enemy courses of action.

Military Operations Other than War

The missions included in the analysis of doctrine for military operations other than war are combatting terrorism, disaster relief, nation assistance, support to counterinsurgency, peace operations, show of force, support to civil authorities, and support to counterdrug operations.

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

FM 90-10 only covers one area related to MOOTW. This manual gives a general overview of civil affairs operations. Civil affairs operations, in the context of FM 90-10, relates to what the Army would call nation assistance today. Its coverage of civil affairs operations is short and general in nature and does not address any of

the peculiarities of civil affairs operations in urban environments, but gives an overview of how on the principles of civil affairs operations.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

This manual does not specifically address any of the MOOTW missions outlined above. However, it does contain a section treating the conduct of MOUT under restrictive conditions. Though not doctrine on the specific missions a task force might encounter in a MOOTW setting, this section addresses issues of restrictive rules of engagement and the use of force in operations other than war.

FM 71-3, The Armored and Mechanized Infantry Brigade

This manual has a section addressing brigade level MOOTW operations, including those listed above. It treats the brigade's conduct of each mission in detail. It does not, however, cover MOOTW operations in an urban setting.

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

FM 71-2 does not cover missions relating to operations other than war in any way. Furthermore, it does not have sections covering topics that relate to MOOTW or their execution in an urban setting.

Army MOUT doctrine is inadequate in providing doctrine for the missions a battalion task force commander can expect to execute. In offensive operations, it does not adequately address the attack of a strongpoint or or raids in MOUT. In defensive operations, it does not cover sector defense or the defense of a strongpoint. MOUT doctrine excludes several operations other than war, including combatting terrorism, disaster relief, nation assistance, support to counterinsurgency, peace operations, show of force, support to civil authorities, and support to counterdrug operations. Current

Army MOUT doctrine does not give the commander the tools he requires to execute the missions he is likely to encounter.

Threat

This section addresses Army MOUT doctrine found in the following four manuals and seeks an answer to the following question: Does the MOUT doctrine assist the MOUT commander in identifying all of the potential dangers or menaces facing his force?

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

The only reference in this manual to potential threats is in its offensive and defensive sections covering how the enemy defends and how the enemy attacks. In each case, the only enemy or threat to which the manual refers is the coldwar-era Soviet Union force. This force employs Soviet doctrine, using Soviet weapon systems.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

This manual refers to the threat and threat analysis in two areas. The first section is very short and mentions that the Army can no longer count on facing a singular, Soviet threat in current and future MOUT. The second area one finds reference to a threat is in Chapter 2, Section III, Threat Evaluation and Integration.

The Threat Evaluation and Integration section of FM 90-10-1 gives the commander a useful tool in establishing the nature of his threat. It covers the range of potential threat, from a conventional force to guerrillas and terrorists. It covers the potential actions of conventional forces and gives the commander an overview of the potential actions of insurgents, guerrillas, and terrorists in an urban environment.

Additionally, it covers several of the social, political, cultural, and economic factors shaping a threat's actions.

FM 71-3, The Armored and Mechanized Infantry Brigade

This manual briefly states that the Army can no longer anticipate facing a single, monolithic, well-defined threat. It states that American forces can count on facing a range of forces, from major regional powers to terrorist groups. These threats are more diverse and less predictable than the Soviet threat of the coldwar. This fact forces us to conduct a rigorous and continuous intelligence preparation of the battlefield.[2]

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

Similar to FM 90-10, FM 71-2 describes threat doctrine by addressing how the Soviets defend and attack. In this case, the manual refers to the coldwar Soviet Union. It does not address how he conducts these operations in an urban environment.

This manual also addresses threat actions in its section discussing the task force level IPB process. This discussion, like the other sections, refers to a singular Soviet-style threat and no others.

The doctrinal treatment of the threat is adequate. FM 90-10-1 gives the commander the basic tools he requires to evaluate both conventional and unconventional threats.

Terrain

This section seeks to answer whether or not Army MOUT doctrine provides the MOUT commander a means to identify the tactical or operational significance of the objective? This section's answer to this question is more in keeping with the idea of

initiative based warfare and giving the commander the freedom to think and act, rather than acting out of habit or repetition.

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

This manual devotes an entire appendix to the treatment of urban terrain analysis. It covers in great detail the types of terrain, construction, and layout a commander can expect in an urban area. For each type of construction, like Type A, Dense, Random Construction, FM 90-10 conducts an analysis of the mobility, fields of fire, obstacles, cover and concealment, fire hazards and command and control encountered in each type of construction. It does not cover at all, however, the tactical or operational value of any of the structures or facilities it describes.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

This manual covers the value of some areas to the task force commander. For example, it discusses the value of public baths, swimming facilities, and cisterns in providing potable water sources in the event conventional or unconventional forces render traditional sources inoperable.

Though this manual states that "urban combat is only combat in different terrain," it goes on to state the importance of a commander understanding the value of tactical or operational targets like power generation or gas production facilities to an opponent, especially in an operation short of war. These types of facilities are prime terrorist or insurgent targets and may have strategic level significance in a small country.

FM 71-3, The Armored and Mechanized Infantry Brigade

This manual does not address terrain analysis relating to MOUT. Additionally, it does not address the operational or tactical value of terrain to the MOUT battalion task force commander.

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

This manual's restricts its treatment of terrain analysis to non-urban, rural terrain. Furthermore, it does not contain a means to analyze urban terrain for its tactical characteristics or its value as an tactical or operational target.

The test for adequacy for terrain analysis reveals that MOUT doctrine is inadequate. While it gives the commander the ability to do the traditional OCOKA terrain analysis, it does not give the commander the ability to understand key systems within the urban environment and their operational value to the him and the threat. Those systems are utilities, communications, transportation, waste management, civil order, and government.

Technology

This section of the study will reveal the answer to the following question: Does current MOUT doctrine give the MOUT commander the means to employ the weapons technology and use the information systems available to him while countering the technology available to his opponent? This technology covers a broad spectrum of items, ranging from the commonplace Bradley Infantry Fighting Vehicle, to relations with the media in a MOUT operation.

FM 90-10, Military Operations on Urbanized Terrain (MOUT)

FM 90-10 devotes Appendix B to the employment of weapon systems and their potential effects in an urban environment. This section limits the discussion to conventional weapons. Those weapons are the M-16, machineguns, M-203 Grenade Launchers, grenades, flame weapons, and antitank weapons.

This manual briefly examines the use of demolitions in breaching walls. This section gives instruction in the principles of demolitions in urban combat.

This manual dedicates an entire chapter to combat support, including artillery, engineer, aviation, air defense, military police, chemical, and communication assets. This section is very general and does not describe any of the weapon systems or technology available to the commander in MOUT.

FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas

This manual gives extensive coverage to the modern technology available to American commanders and threat commanders in a MOUT situation. It predicts that many third world countries will soon be able to afford technologically advanced systems, previously only available to a few select countries. The manual lists these systems, ranging from precision guided munitions to improved communications capabilities.

FM90-10-1 briefly discusses the value of the global positioning system (GPS) for use in navigating through urban terrain. Though it states that the GPS will likely be effective in a city, it does not outline the various ways a commander might use GPS to gain an advantage over his opponents.

The combat support section of FM 90-10-1 is far more detailed than that of FM 90-10. FM 90-10-1 covers mortars, artillery, naval gunfire, tactical air support, air

defense, Army aviation, military police, and communications in MOUT. This manual gives a detailed description of the urban combat capabilities of each of these systems and goes into much greater detail about the specific systems available to the MOUT commander.

This manual briefly describes how an urban force commander might interface with the media. It does not cover the potential value of favorable relations with the media or, more importantly, the potential harm unfavorable media relations might have on an Army MOUT commander. Moreover, it does not address the effect of almost instant worldwide communications on urban operations.

This manual covers the weapons systems available in MOUT in great detail. These systems include rifles, machineguns of all sizes, grenade launchers, antitank weapons, flame weapons, grenade launchers, demolitions, aerial weapons, tanks and fighting vehicles. It also covers the employment of naval and artillery gunfire. This section of the manual describes the weapon system and its variations, its employment in MOUT, and the potential effects and considerations of using that weapon system in an urban environment.

FM 71-3, The Armored and Mechanized Infantry Brigade

FM 71-3 has a section describing the integration of a heavy force with light infantry and special operations forces. This section details the integration of these units and the systems associated with them, but in very general terms. Additionally, it does not discuss these issues in relation to a MOUT setting.

FM 71-3's Appendix E, Digitization of the Combined Arms Brigade, describes several of the concepts, units, and systems involved in digital warfighting. It outlines in general terms the uses, employment, and capabilities of these systems. Though it

covers several new and emerging technologies. it does not apply them to the urban environment.

FM 71-2, The Tank and Mechanized Infantry Battalion Task Force

In FM 71-2's only discussion of technology, it describes the use. capabilities. and employment of directed energy weapons (DEW). These weapons include lasers. high power microwave weapons. and electronic weapons. It details the employment and effects of these weapons. but not their use in a MOUT environment.

MOUT doctrine gives the commander several firepower-based options on which to develop courses of action. It gives him the ability to use firepower to its fullest extent. The use of firepower and its associated technology has been the basis for Army MOUT doctrine since World War II. The doctrine is inadequate in that it does not give the commander any guidance on the application of non-firepower-based technology to urban combat.

Historical Vignettes

Current Army MOUT doctrine views cities as merely another pieces of terrain. Urban terrain is costly in time. resources, and personnel to attack and defend and should be avoided. If the attacker cannot avoid involvement in MOUT. Army doctrine only provides firepower based solution against a conventional threat. Recent history indicates that urban fighting will become more frequent in the future. The Army will be drawn to city fighting. either by the strategic or operational value of the city. or simply through the urbanization of the world. In any case, the Army will certainly operate more frequently in urban settings in the future. Furthermore, the Army must be prepared to apply both firepower and non-firepower based solutions to urban

fighting. The following vignettes illustrate these points using both ends of the spectrum. The Russians in Grozny arrived prepared to apply a firepower based solution to attacking the city, when a non-firepower based solution would have been far more successful. In the other vignette, the U.S. forces in Somalia, through mission creep, lost the ability to apply a firepower solution when the situation clearly warranted doing so.

Grozny, 1994

The Russian republic of Chechnya was in rebellion against the Moscow government. Moscow's response was to send three invasion columns into Chechnya to stop the rebellion and to keep the republic in the nation. These columns were not the Russians held in awe by American forces during the cold war. They were mostly conscripts, poorly trained and their morale was low. On the other hand, the rebels, though until recently Russians themselves, were well supplied, operating on their home territory and their morale was high.[3] Both sides shared the same training and doctrine. Even though it involves neither the United States Army nor its doctrine, this case provides valuable lessons on MOUT in high intensity conflict.

Since the Russians and Chechnyan rebels began as soldiers in the same army, it follows that they shared a common MOUT doctrine. Like American MOUT doctrine, the Russians favored bypassing built-up areas when possible, leaving them for following second echelon forces. If bypassing was not possible, either because of the value of the area or time, the Russians planned to quickly attack from the march in order to keep the defender from building a credible defensive force. These attacks from the march were difficult to control and often required more freedom of action and training for the urban area commander than the Russian doctrine found

appropriate. If the attack from the march was not possible and the city was still valuable to the effort, the attacker blockaded the urban area, guarded it with a covering force and left it to starve.[4]

The Russians used armor as assault force in MOUT or as a supporting force for the assaulting infantry troops. Additionally, airborne or air assault forces attacked key terrain to seize terrain along avenues of advance or to act as a forward reconnaissance element for the advancing assault force. Russian MOUT doctrine centered around always delivering a high volume of fire. Their doctrine stresses the use of all levels of buildings, from the basement to the top floors, not just the ground floor. In the defense, the Russians stressed a flexible and mobile approach to defending urban areas.

When the Russians attacked the rebels in the Chechnyan capital of Grozny in late 1994, they expected rebel resistance to be weak at best. The Russians began their attack with a erratic, but week long air and artillery strikes that built to a crescendo as they planned to start their assault on New Year's Eve, 1994. Their main objective was the city's railway station. The Russian forces numbered approximately 2,000, while the rebels mustered approximately 5,000 men. The Russian advance began at about 1300, with armor moving along the city's main avenues. The Russians placed heavy and accurate fire along both sides of the streets. The rebels withdrew initially to draw the Russian armor deeper into the city. The Russians planned to conduct a combined arms assault, with the armor supporting the infantry. What resulted was that the infantry waited too long to dismount from the armor, yielding easy targets for rebel gunners firing from above the vehicles.[5]

Like their doctrine states, the Russian assault on Grozny was to begin with an air assault to the center of town and on top of key buildings. The infantry and armor force were to subsequently link up with the air assault force.

The rebel tactics were simple. Allow a vehicle to pass and shoot it in the rear, destroying it and blocking passage for following vehicles. As the occupants evacuated the vehicle, the rebels killed them one by one. The rebels took this technique directly from the Afghans. This was very effective and caused great panic and disorientation in the attacking force. The rebels did not restrict their defense to the confines of the city. They ventured outside the city to attack the Russians follow-on echelons and their artillery stationed outside the city. The Chechnyans also used the limited media available to them to their advantage. Chechnyan television broadcasted live action footage continuously throughout the battle.[6]

The New Year's Eve battle for Grozny was a success for the rebels. They destroyed 20 of 26 tanks, 100 of 120 armored personnel carriers, and caused 500 Russian casualties.

Mission

The Russian seizure of Grozny applied a firepower solution when something less was clearly required. First, the Russians attacked their own people. They could gain nothing by killing hundreds of people in an attempt to reunite the country. This hardened the rebels' resolve and only served to motivate the rebels to fight and further divide the country. Second, the Russians destroyed a large portion of the city during their attack, only to have to rebuild the city after the fighting ended. The Russians were sent to secure the city and did so using firepower alone. They failed to understand the need for a more peaceful solution to this problem, while their doctrine

did not provide a non firepower based solution. As a result, the Russians failed to achieve their goal.

Threat

The Russians have doctrine for MOUT fighting against a conventional threat. In this case, their threat was unconventional in nature. Their lack of doctrine against an unconventional threat contributed to their early losses in this operation.

The Russians failed to understand and appraise their enemy. They should have studied and fully evaluated their threat and refined their intelligence estimates to reflect the rebel's training, disposition, and will to fight. Instead, the Russians assumed their threat would be weak at best. Had the Russians fully understood the nature of their opponent, a solution might have been to fully isolate the rebels and starve them into submission.

Terrain

Since this battle took place on Russian soil, the Russians should have been and were intimately familiar with the terrain and its peculiarities. They conducted a military analysis of the terrain without understanding the implications and values of specific targets within the terrain.

Technology

The battle for Grozny is reinforcement of the fact that technological advantages diminish in urban fighting. The rebels used proven, simple techniques and equipment to defeat a more advanced and better equipped force. The rebels did use available technology to their advantage by establishing a system of command detonated mines

throughout Grozny, controlled by the phone system. For unknown reasons, they never used the mines, but later Russian Spetnaz forces disarmed the system.[7]

The Russians did not synchronize the use of their own technology to overpower the rebels. Though a firepower-based solution was viable, the Russians failed to concentrate their overwhelming combat power to defeat the rebels.

The Russians learned from some of their initial mistakes in their attack on Grozny. They continued the attack and were able to take the city by the end of February 1995. By that time, most of the city was rubbled and 300,000 of the city's 400,000 residents had become refugees.[8]

Mogadishu, 1993

America's involvement in Somalia began as a humanitarian mission and by 1993 had turned, through mission creep, into something far more involved and broader in scope. The event that triggered the famous American battle in the streets of Mogadishu was not over the distribution of meals to starving Somalis, but over the capture by American Task Force Ranger of twenty-four Somali prisoners, two of which were men of fleeing Somali militia leader, Mohamed Farah Aideed.[9] Colonel Sharif Hassan Giumale was the Somali militia leader who orchestrated the Somali attack on the Americans on 3 October 1993. Colonel Guimale ordered Colonel Ali Aden to organize his men and "don't let reinforcements reach the enemy pocket."[10] The pocket to which Colonel Guimale referred was the one the Somalis formed around Task Force Ranger at the building containing the twenty-four prisoners.[11]

Colonel Aden's plan was simple. He organized his men into six squads of six or seven men and had them fade into the throngs of Somalis filling the area near where Task Force Ranger held its captives, preparing them for evacuation. Additionally,

Colonel Aden added a sharpshooter to each of the six squads to make up for the lack of marksmanship of his troops. To conserve ammunition, Colonel Aden reminded his militiamen of the Somali adage, "one man, one bullet."[12] The swarms of Somalis in the area made it very easy for the attacking militiamen to move unnoticed very close to Task Force Ranger without detection. Members of the crowd who could locate weapons joined in the attack. The confusion and escalating action bolstered the confidence of Colonel Aden's militiamen.[13]

Approximately 40 minutes after the attack began and before Colonel Aden's men arrived, other Somali militia forces had already shot down an American helicopter attempting to assist Task Force Ranger. The helicopter crashed about 300 yards east of Task Force Ranger's location. The 10th Mountain Division alerted the Quick Reaction Force in case they needed to assist Task Force Ranger in this situation.[14] Within minutes over 90 Americans arrived by helicopter at the location of the downed helicopter. The Somalis turned this into a kill zone, with small arms and rocket grenade fire.

Lieutenant Colonel Danny McKnight, commander of Task Force Ranger moved his convoy of Somali prisoners to reinforce the helicopter crash site. The Somalis engaged Lieutenant Colonel McKnight's convoy with intense small arms and rocket fire, destroying one of the convoy's trucks. Concerned that the mission would fail if the prisoners were not extracted, Major General William Garrison, commander of the task force, ordered the convoy back to the base at the airfield.

Meanwhile, the Somalis shot down another American helicopter using rocket propelled grenades. The Quick Reaction Force left the airfield to assist the Rangers in securing the crash sites. Colonel Aden's men pinned the Quick Reaction Force down

in an ambush. A third helicopter attempting to deposit forces at the second crash site was hit with a rocket and forced to make a crash landing. All four crew members survived.[15]

By this time, it was dark. The Somalis were successful so far. The Somalis trapped the Americans in the pocket and denied American reinforcements, though the Americans dropped supplies by air into the pocket. To the Somalis' count, they destroyed two American helicopters and damaged three others. General Aideed issued further orders to Colonel Guimale, instructing him to strengthen his positions, continue to prevent any American reinforcement, and, above all, prevent the Americans from escaping. The two Somalis communicated using couriers to keep the Americans from locating them and eavesdropping on their radio conversations. Colonel Guimale considered firing his six 60mm mortars at the trapped Americans in an effort to finalize their destruction. He decided against the mortar attack in order to prevent additional civilian casualties.[16]

Pakistani and Malaysian armor reinforced the 10th Mountain Division's Quick Reaction Force. The convoy of over 70 vehicles departed the airfield to reinforce the Rangers after 2300. Farther north, a company from the Quick Reaction Force battled through several ambushes to link up with Task Force Ranger at about 0100.[17]

Though their casualties were horrible compared to any standard, the Somalis were successful in their attack on the Americans. The 16 hours of fighting in Mogadishu led directly to the American withdrawal from Somalia. The Somalis absorbed over 800 dead and over 300 injured. The Somalis killed 10 and wounded 64 Americans.[18]

Mission

The American force was unprepared for what it faced on 3 and 4 October 1993. The American mission there started as a humanitarian assistance mission and by the time of the battle, was as much a combat operation as Operation Just Cause, Operation Desert Storm or any other recent operation. This lack of preparedness relates directly to the fact that though American forces arrived there to assist in curbing the starvation and suffering in Somalia, their mission expanded well past humanitarian assistance into a near combat footing. The American forces lacked the ability to use a firepower solution to their problem. As a result, Task Force Ranger was unprepared to react to the resistance it met during this battle, and furthermore, because of the humanitarian nature of the original mission, the American forces lacked the firepower, in the form of armor to react to such a situation.

Threat

The American forces did not fully understand the threat in Mogadishu. With the country in chaos, they may not have been able to identify the various factions and clans with power in Somalia. Nonetheless, a complete threat assessment might have assisted the American forces in predicting the reaction of the Somali forces to the American presence and enabled the Americans to formulate a proper response to the threat.

Terrain

The Somalis were extremely familiar with the terrain, since most of the militia members were natives of Mogadishu. In contrast, the American force did not have a

thorough understanding of the Mogadishu terrain or the value of targets and areas within Mogadishu.[19]

Technology

The MOUT battle in Mogadishu reinforces the fact that a small band of determined lightly armed soldiers can control a large area and defeat a larger, more sophisticated force. Additionally, an urban environment, even a relatively underdeveloped one like Mogadishu, reduces a force's technological advantage.

The Somalis were very innovative in attacking the Americans. Their squads melted into the surrounding crowds. This, along with the militia's civilian dress, assured their concealment and allowed them to move to within close range of the Americans. Additionally, it made it very difficult for the Americans to identify them in a crowd and to return fire, for fear of injuring innocent bystanders. The Somalis used a simple plan. Shoot rifles at people and rockets at vehicles and helicopters. The close ranges allowed by the narrow streets of the city and the low-flying helicopters assured the Somalis would hit most of their targets. Finally, the Somalis used runners to negate some of the American technology. If the Somalis had used radios, the Americans could have easily located their command posts.

Summary

This chapter endeavored to present, analyze, and interpret the evidence gained through research. It applied four basic tools to the current doctrine and used two historical vignettes and in an attempt to determine the adequacy of the doctrine when measured against these tools. Like their Soviet style counterpart, American MOUT doctrine provides only firepower based solutions to MOUT missions. The historical

vignettes clearly indicated the need for a force to apply firepower when required, but also to have the ability to recognize the need for and use non-firepower based solutions when needed. The battle for Grozny clearly indicated the consequences of misapplied doctrine. It illustrated how a commander must have the tools to thoroughly evaluate the threat he faces in terms of not only the usually analysis, but what motivates his threat and why the enemy is fighting. The Russian commander used firepower to defeat the rebels when a more peaceful method was required. The Russian commander had no understanding of the systems of the city and how those systems could affect his course of action and how to use them to defeat the rebels. Finally, the Russian commander had the doctrine to enable him to use the available technology, but he failed to do so properly. The Rangers' fight in Mogadishu illustrated that, though the Army lacks the doctrine to conduct many operations other than war in a MOUT setting, the Army must always be prepared to use force as required. This case illustrates, because of the threat's willingness to use civilians for cover and concealment, that the Army must development other than firepower-based means of dealing with threats, while retaining that firepower capability. Mogadishu also portrays what can happen when a commander does not have the tools to understand the threat he faces. If the American commander had understood that the intent of the enemy leader was to simply inflict enough casualties on the American forces to make them leave, the Americans could have reacted more effectively. This chapter also indicated the shortcomings of Army MOUT doctrine in relation to the mission, threat, terrain, and technology model. The next chapter will draw conclusions from this analysis and make recommendations based on those conclusions.

[1]U. S. Army, FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas (Washington: Department of the Army, 1993), 4-28.

[2]U. S. Army, FM 71-3, The Armored and Mechanized Infantry Brigade (Washington: Department of the Army, 1996), 2-3.

[3]Adam Geibel, "Lessons in Urban Combat, Grozny, New Year's Eve, 1994," Infantry Magazine, November-December 1995, 21.

[4]Ibid., 23.

[5]Ibid., 22.

[6]Ibid., 25.

[7]Ibid., 24.

[8]Ibid., 23.

[9]Rick Atkinson, "Night of a Thousand Casualties," The Washington Post, 31 January 1994, A1.

[10]Ibid.

[11]Ibid.

[12]Ibid., A9.

[13]Ibid., A10.

[14]Ibid., A9.

[15]Ibid., A10.

[16]Ibid., A11.

[17]Ibid., A11.

[18]Ibid., A12.

[19]Sean D. Naylor, "The Urban Warfare Challenge," Army Times, 15 April 1996, 13.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter will draw conclusions from the analysis presented in Chapter 4, and make recommendations based on those conclusions. It will answer the primary question. Is the Army's current MOUT doctrine adequate to meet current and future requirements? Additionally, this chapter will explain the significance of these conclusions on MOUT doctrine. Additionally, this chapter will recommend areas worthy of further study revealed through the conduct of this study.

Conclusions

Current Army MOUT doctrine is inadequate to meet current and future requirements. MOUT doctrine is inadequate, unless the current or future requirement involves facing a singular, monolithic Soviet threat in a European environment. Furthermore, the Army does not provide the battalion task force commander, faced with operations in an urban environment, with the doctrinal tools he needs to be successful in a MOUT. Neither of the manuals most closely associated with battalion task force operations, FM 90-10, Military Operations on Urbanized Terrain (MOUT), FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas, provides the MOUT commander with the doctrinal tools, tailored to use at his level to conduct anything less than high intensity operations against the Soviets in Europe.

FM 71-3, The Armored and Mechanized Infantry Brigade; and FM 71-2, The Tank and Mechanized Infantry Battalion Task Force give very little coverage to MOUT and in most cases, refer to the above manuals for additional information. This study will examine this inadequacy in relation to the included historical vignettes and the doctrinal analysis.

Doctrinal Analysis

Mission

Army MOUT doctrine gives a battalion task force commander the basic tools to execute a hasty and deliberate attack, and defense of a battle position and strongpoint. To gather these tools, the commander must use a combination of FM 90-10 and 90-10-1. The doctrine only gives limited coverage to missions related to MOOTW. FM 90-10-1 assists the commander in its section covering MOUT under restrictive conditions.

Threat

Though MOUT doctrine gives the commander the basic tools to understand his threat, the task force commander must turn to other publications to get information related to the range of threats he might face in an urban operation. MOUT doctrine listed in the manuals this study examines either stresses facing a singular Soviet threat or lightly discusses facing unconventional opponents like guerillas or insurgents. FM 90-10-1 gives the most extensive treatment of unconventional threats, but fails to give enough information to determine probable courses of action by this type of threat. Additionally, MOUT doctrine does not give

the MOUT commander the ability to understand and counter unconventional threats in an urban setting.

Terrain

Army doctrine gives the commander several good tools to use in terrain analysis. With FM 90-10 and 90-10-1, he can gain an understanding of types of construction and the general layout of most types of cities. The problem with FM 90-10's coverage is its restriction to Europe in its analysis. Though FM 90-10-1 give some coverage to different types of MOUT terrain and their significance to commander in tactical or operational value, there is no repository of information that summarizes the tactical and operational value of different terrain in MOUT. The commander must intuitively understand the significance of terrain like power and television stations, water purification facilities and power generation facilities.

FM 90-10 extensively covers urban terrain analysis. It gives an indepth description of the types of construction a unit is likely to encounter in MOUT and a description of the different layouts of urban environments. The manual restricts its discussion to a European environment. FM 90-10-1 gives the reader some discussion of the political, social, and economic value of terrain, but the treatment is too short and shallow. Neither FM 71-3 nor FM 71-2 cover urban terrain analysis at all.

None of the manuals gives the commander the ability to understand the systems of the city and their impact on his and his enemy's operations. Utilities, communications, transportation, waste management, civil order, and government are all systems that the MOUT commander must understand in order to be successful.

Technology

None of the Army's current MOUT doctrine explains the use of modern technology in MOUT except for weapon systems. FM 90-10-1 is the only manual that mentions the use of technology other than weapon systems, in its explanation of the use of GPS in an urban setting. Furthermore, this manual gives the most detailed and modern description of the weapon systems available to the MOUT commander.

The MOUT commander has no doctrinal resource from which he can draw guidance on non-firepower-based solutions to MOUT problems. The commander must, instead, rely on lessons learned and improvise in order to solve problems that do not allow for the use of a firepower solution.

Historical Vignettes

Both historical vignettes allow conclusions relating to the adequacy of American MOUT doctrine. A commander must have the ability and doctrine to use non-firepower based solutions to MOUT problems. At the same time, the commander must have the ability to apply overwhelming firepower when required. Both cases revealed that the technological advantage an adversary's reduces or loses his advantage in urban combat. An opponent can defeat the latest technology, given the right conditions.

The MOUT commander must have a means to understand the nature of his threat. This understanding includes how the opponent fights and the social, political, cultural, and psychological components of the threat. Each vignette revealed a failure of the Russian or American commanders to understand the tenacity with which their opponents would fight. This tenacity relates directly to the social, political, cultural, and psychological makeup of the enemy.

The Grozny vignette reminded us that a force must have other means to operate in an urban setting than a firepower based solution.

Understanding terrain and the value of various facilities is key in urban combat. The Somalis had a great understanding of the terrain simply because they were native to it, but they also understood the tactical and operational value of components and facilities. Conversely, the Americans failed to understand the value of the terrain and were unable to use it to their advantage.

Recommendations

Publications

FM 90-10

The Army must update FM 90-10 to reflect current threats, terrain, and technology. The new manual must retain the ability to outline high intensity conflict while giving the commander the ability to operate in OOTW. It must broaden its description of potential threats to cover more unconventional threats. It must enable the commander to analyze urban terrain using the systems available in the city, like utilities, communications, transportation and governement. Finally, the new manual must give the commander the ability to use non firepower based technology to his advantage.

The Army must retain the ability to fight the nation's battles, regardless of the current requirements or missions other than war that the country asks the Army to perform. Therefore, FM 90-10 must continue to provide the Army with a firepower-based MOUT doctrine. It must outline high intensity conflict in MOUT and how the Army will conduct those types of operations. Additionally, Army MOUT doctrine

must address OOTW in MOUT. FM 90-10 is the vehicle for establishing this doctrine.

FM 90-10 uses an effective format, which the manual should retain. It describes the operations, how the enemy is likely to fight, and describes the operations at different levels. This allows the reader to understand how units at different levels conduct this operation.

The Army must remove two items from FM 90-10. Though the Army must prepare to face a large, conventional MOUT threat in a mid to high intensity conflict, the Army should delete FM 90-10's reference to the Soviet threat and replace those references with a broader threat scope. That scope should include, at a minimum, references to middle eastern or far eastern countries, with representation of expected climatic, geographical, and architectural differences. Additionally, FM 90-10 must remove the reliance on a purely European setting and broaden the scope of terrain analysis to include the entire world and its range of possible terrains.

FM 90-10 must add three areas in its new form. Those areas are the peculiarities to MOUT in OOTW, the range of potential goals and objectives of potential threats, and establish doctrine for the range of operations a unit might conduct in an urban setting. The commander must know how to employ the latest technology in MOUT. FM 90-10 must explain, like it does for various weapon systems, the use of cellular communications, computers, telephone, television, and radio systems, and other forms of modern technology in an urban setting. It must explain to the commander, how different facilities and objectives affect the conduct of operations and their tactical and operational value. These facilities include water and sewage treatment plants, electrical facilities, communications systems, and

transit systems. Finally, FM 90-10 must establish doctrinal principles for the conduct of operations other than war in MOUT. These missions include combatting terrorism, disaster relief, nation assistance, support to counterinsurgency, peace operations, show of force, support to civil authorities, and support to counterdrug operations. The Army currently conducts each of these operations must have a MOUT doctrine for executing these missions in an urban setting.

FM 90-10-1

FM 90-10-1 is an excellent how-to manual and the Army should make minor changes to its current format. First, it should contain a treatment of the conduct of tasks associated with operations other than war, like non-violent crowd control, patrolling, and other operations in situations that are likely to have restrictive rules of engagement. Next, the manual should include the latest technology, like the Javelin.

71 Series of Field Manuals

These manuals, specifically FMs 71-2 and 3, should expand to include the operations other than war missions a battalion or brigade might execute, in both urban and rural settings. Additionally, these manuals should continue to refer to FMs 90-10 and 90-10-1 as the source for MOUT doctrine.

Suggestions for Further Research

This study examined a relatively narrow portion of the Army training and doctrine associated with MOUT. This section of the study will outline the several pertinent areas associated with MOUT doctrine revealed through the author's research that require further in-depth research.

FMs 90-10 90-10-1 only address maneuver warfare, and then some of the key components like the use of aviation are omitted. As a result, the Armor and Infantry branches are the only branches with written MOUT doctrine. The Army should study the need for the development of MOUT doctrine for other branches and how that doctrine should relate to both combat operations and OOTW.

Non lethal weapons are now widely available for use by the Army in a range of operations. Non lethal weapons, like crowd controlling foam have a great potential for use in crowd control. As the Army conducts more OOTW, the need for non lethal means of engagement will increase in all types of operations, not just MOUT. The Army should study the variety of non lethal weapons available for use and decide which of those are potentially beneficial for use in an urban environment. After this selection, the Army should formalize their use by establishing written doctrine on their employment in urban environments.

Because units conduct MOUT training on a specific type of terrain, most Army installations with MOUT sites spend a great deal of resources in building and maintaining these MOUT sites. MOUT sites are also very popular for training and scheduling is competitive. With MOUT site cost and popularity, along with the idea that operations in urban settings will face almost every unit deployed in the future, the Army should study the effectiveness of how we train to conduct MOUT. This study should include how platoons, companies, and battalions do MOUT training. The study should address the available training publications associated with MOUT like Mission Training Plans (MTPs). It should also examine the effectiveness of how we conduct rifle marksmanship training on MOUT operations.

The Army fielded several new weapon systems and changed several existing weapons since the publication of the current FM 90-10. These weapons range from entire systems like the Mark 19 to the changes to the M-16 rifle to the use of precision guided munitions. The Army should study the value of the use of these weapons in MOUT. Subsequently, the Army should establish written doctrine, or changes to existing doctrine to reflect the new or changed weapons systems.

Summary

The Army's current MOUT doctrine is inadequate to meet current and future requirements. The Army has firepower based doctrine, when recent operations indicate OOTW operations do not allow the application of firepower to succeed. Furthermore, our doctrine does not allow the MOUT commander to effectively evaluate his potential threat, understand the urban environment's systems, or use non firepower based technology effectively. Major Ralph Peters says, "we will not be able to avoid urban deployments short of war and even full-scale city combat. . . A military unprepared for urban operations across a broad spectrum is unprepared for tomorrow.[1] Our current MOUT doctrine is dated, referring to a singular Soviet threat in Europe when our forces are fighting factions in Somalia. Our doctrine does not address the range of missions a unit is likely to execute, nor does it provide our commanders with the tools to evaluate his urban threat. It does not help the commander evaluate the urban terrain before him to identify its facilities tactical or operational value, and it does not give the commander the tools he needs to successfully employ all of the technology available to him over the range of conflict. The Army must establish tools and doctrine for these shortcomings and integrate

them into FMs 90-10 and 90-10-1. Finally, again in the words of Major Peters, "We must begin judicious restructuring for urban combat in order to gain both efficiency and effectiveness-as well as to preserve the lives of our soldiers."[2]

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[1]Ralph Peters, "Our Soldiers, Their Cities," Parameters 361 (Spring 96): 43.

[2]Ibid., 50.

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2. Thesis Author: MAJ Phillip T. Nethery

3. Thesis Title: Current MOUT Doctrine And Its Adequacy For Today's Army

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Military Operations in Urban Terrain (MOUT): A Future Perspective for a Joint Environment

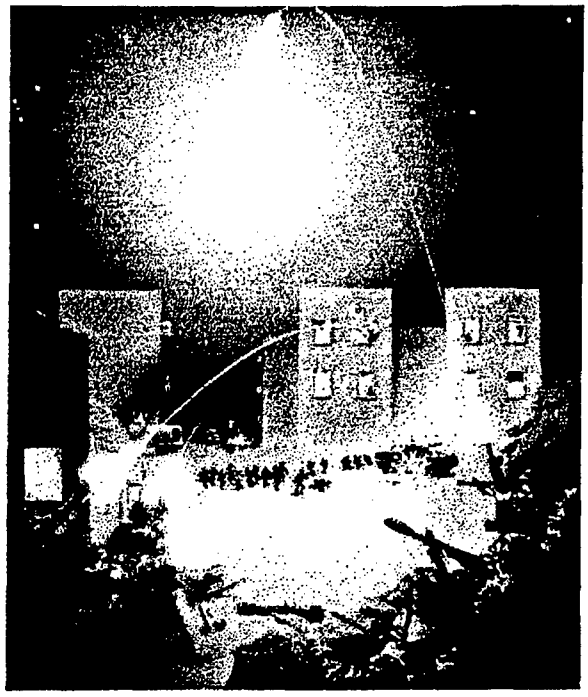
AD-A326881

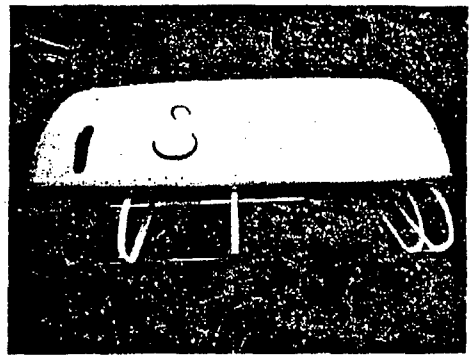
February 1997

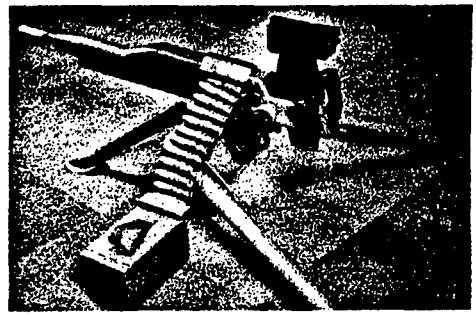
Naval War College
Newport, RI

Military Operations in Urban Terrain (MOUT)

A Future Perspective for a Joint Environment







By

Stephen J. Mills
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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASS	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY N/A	3. DISTRIBUTION / AVAILABILITY OF REPORT Unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE N/A	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) NAVAL WAR COLLEGE	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION ADVANCED RESEARCH DEPT. — 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) US NAVAL WAR COLLEGE NEWPORT, RI 02841	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION — 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. — PROJECT NO. — TASK NO. — WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Military Operations in Urban Terrain (MOUT), A Future Perspective For a Joint Environment

12. PERSONAL AUTHOR(S)
MAJ Stephen J. Mills, US Army

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM Nov 96 TO Mar 97	97,2,14	66

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Military Operations in Urban Terrain (MOUT), Urban Warfare, future threat, Joint warfighting

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Military Operations in Urban Terrain (MOUT) is the likely future environment facing Joint Task Force Commanders. This unique battlefield environment will require the best efforts of U.S. forces to ensure victory. An integrated approach to MOUT is required in order to achieve victory in the future. This paper states that through an examination and focus in the areas of doctrine, training, organizational design, technology and the warrior, US forces will be best prepared for future MOUT. A future threat assessment is provided to serve as a baseline for comparison. The conclusion of the paper identifies the overarching importance of the individual combatant over other considerations such as organizational design, technology, etc,.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS		
22a. NAME OF RESPONSIBLE INDIVIDUAL PROFESSOR JOHN B. HATTENDORF	22b. TELEPHONE (Include Area Code) (401) 841-2101	22c. OFFICE SYMBOL 35

DD FORM 1473, 84 MAR — 83 APR edition may be used until exhausted. All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

☆U.S. Government Printing Office: 1985—539-012

Military Operations in Urban Terrain (MOUT)
A Future Perspective for a Joint Environment

By

Stephen J. Mills
Major, U.S. Army

An Advanced Research Project

A paper submitted to the Director of the Advanced Research Department in the Center for Naval Warfare Studies in partial satisfaction of the requirements for the Master of Arts Degree in National Security and Strategic Studies.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature _____

14 Feb 97

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GLOSSARY

Advanced Warfighting Experiment (AWE) - TRADOC Battle Lab experimental event whose effort is focused on a major increase to warfighting capabilities. AWEs are center of gravity culminating efforts focused on a major increase to warfighting capabilities. AWEs address all the domains of doctrine, training, leader development, organization design, materiel and soldier systems requirements.

Army FORCE XXI - Force XXI is the redesign process of the Army for the 21st Century. It incorporates three complementary and interactive efforts. The first and most important element is focused on the redesign of Army operational forces. The second and supporting element is the redesign of the institutional forces-the elements that generate and sustain the operational forces. The third element is focused on the development and acquisition of information age technologies, which are the overall enablers of the Force XXI Campaign.

Commandant's Warfighting Lab (CWL) - The CWL, based at Quantico Marine Corps Base, is the USMC's only battlefield laboratory. Its charter is very similar to that of the TRADOC Battle Labs. The CWL is designed to experiment with new technology and concepts to support future USMC warfighting requirements. The CWL spearheads the Sea Dragon effort.

Dismounted Battlespace Battle Lab (DBBL) - TRADOC Battle Lab responsible for dismounted soldier battlefield domain. The DBBL address all the domains of doctrine, training, leader development, organization design, materiel and soldier systems requirements as they relate to dismounted battlespace. The DBBL spearheads the Army's MOUT ACTD effort, the Rapid Force Projection Initiative and numerous other programs.

Force Suitability Principle (FSP) - A force tailoring principle originated by doctrine writers at the U.S. Army Military Police School.

MOUT Advanced Concept Technology Demonstration (ACTD) - The MOUT ACTD is series of related field experiments designed to demonstrate the military worth of new concepts and technologies in the MOUT environment. The ACTD will be conducted in two iterations. Each iteration will consist of a two-year search for, and initial demonstration of, mature technologies to meet the user requirements, culminating in a series of field experiments to demonstrate the military value added of those capabilities. It will also set the stage for rapid acquisition of those technology applications, which are deemed valuable by the users.[1]

Military Operations in Built-Up Areas (MOBA) - A term synonymous with MOUT.

[1] Burgess, pg 3

Military Operations in Urban Terrain (MOUT) - MOUT is defined as all military actions that are planned and conducted on terrain where man-made construction affects the tactical options available to the commander.[2] Also called MOBA.

Military Operations Other than War (MOOTW) - Encompasses the use of military capabilities across the range of military operations short of war. These military actions can be applied to complement any combination of the other instruments of national power and occur before, during, and after war. Also called MOOTW.[3]

Objective Crew Served Weapon (OCSW) - Conceptual weapon system currently under development by the Joint Service Small Arms Program and the U.S. Army Infantry School. This system is the planned replacement for both the M2 .50 cal Heavy Machine Gun and the MK19 40mm Grenade Machine Gun.

Precision Engagement (PE) - Precision engagement will consist of a system of systems that enables joint forces to locate the objective or target, provide responsive command and control, generate the desired effect, assess the level of success, and retain the flexibility to reengage with precision when required.[4]

Precision MOUT - Conventional forces conduct these operations to defeat an enemy that is mixed with noncombatants. They conduct these operations carefully to limit non-combatant casualties and collateral damage.[5]

Rapid Force Projection Initiative - DBBL initiative using an architecture of Hunters and Killer systems which work together to form the ground based Precision Engagement (PE) network.

Rules of Engagement (ROE) - Directives issued by competent military authority that delineate the circumstances and limitations under which U.S. forces will initiate and/or continue combat engagement with other encountered forces. ROE is often an important consideration in MOOTW, but applies across the entire range of military operations.[6]

Sea Dragon - The Sea Dragon Concept is the USMC's vision of warfighting in the 21st Century. Sea Dragon is a naval expeditionary concept applicable across the spectrum of conflict and in all warfare environments.[7]

Shooter to Sensor Linkage- The mechanism(s) by which data gained by sensors is processed to identify targets and the targets are passed to a weapon system for engagement

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[2] FM 90-10-1, pg. 1-1
[3] JP 3-07, pg. GL-3
[4] Army Vision 2010 homepage
[5] FM 90-10-1, pg. 1-2
[6] FM 100-23, pg. 112
[7] Commandants' Warfighting Lab (CWL) Home Page

Small Arms Common Module Fire Control System (SACMFCS) - Prototype full solution fire control system for small arms. This system incorporates night imaging, range determination and an integrated sensor package to increase weapon effectiveness. This system began as an initiative under the Joint Service Small Arms Program (JSSAP).

Surgical MOUT - These operations are usually conducted by Joint special operations forces. They include missions such as raids, recovery operations, and other special operations (for example, hostage rescue).[8]

[8] FM 90-10-1, pg. 1-1

EXECUTIVE SUMMARY

Introduction Military Operations in Urban Terrain (MOUT) is the likely future environment facing Joint Task Force Commanders. This unique battlefield environment will require the best efforts of U.S. forces to ensure victory. The recognition by doctrine writers and senior leaders that MOUT and Military Operation Other Than War (MOOTW) are strongly linked will be an important factor in the success of future MOUT.

An integrated approach to MOUT is required in order to achieve victory in the future. This integrated approach states that through an examination and focus in the areas of doctrine, training, organizational design, technology, and the Warrior, U.S. forces will be best prepared for future MOUT.

Historical Examples Historical examples of MOUT provide insights into how best to conduct future MOUT. Haiti, Somalia and Grozny provide examples as part of the Threat Assessment, (See Annex A). Haiti represents the lowest end of the MOUT conflict spectrum, Lebanon/Mogadishu represents the middle, and recent operations in Grozny, Chechnya, represent the highest level of intensity. A brief discussion of operations During WWII will provide a baseline for comparison with future MOUT. These examples lead to an appreciation of the differing complexities of MOUT throughout the full range of military operations.

Threat Assessment. A future threat assessment is included at Annex A. This assessment examines threat and friendly force doctrine, training, organizational design and technology and defines the environment within which future MOUT will be executed. By doing so, comparisons between threat and friendly forces can be made and examined.

Doctrine, Training, Organization, Technology and Warrior Analysis. Doctrine, training, organizational design and technology directly support the Warrior. The Warrior is the focus for success in the MOUT environment regardless of the level of conflict. The analysis of these areas will directly address what focus is required to defeat the future MOUT threat. This analysis is not intended to provide future MOUT doctrine or identify the ultimate answer(s) for organizational design. Its intent is to provide insights to the challenges ahead for U.S. forces in future MOUT.

Conclusion. Many opinions exist regarding how to best prepare for future conflict. While doctrine, training, organizational design, and technology must be considered, the most important component of battlefield success is the Warrior. The importance of dynamic MOUT doctrine, organizational design optimized for MOUT, and technological advances should not be underestimated. These factors are ***enablers,*** which directly support the Warrior. The key to victory in future MOUT is focusing these ***enablers*** in direct support of the Warrior. If accomplished by the Joint Military community, the probability of success of the Warrior in future MOUT across the entire spectrum of military operations will be enhanced.

Introduction

Military Operations in Urban Terrain (MOUT) is the likely future environment facing Joint Task Force Commanders. This unique battlefield environment will require the best efforts of U.S. forces to ensure victory. The recognition by doctrine writers and senior leaders that MOUT and Military Operation Other Than War (MOOTW) are strongly linked will be an important factor in the success of future MOUT. By applying this relationship, future MOUT doctrine can be focused to include an emphasis on all levels of conflict instead of only on the higher end of the conflict spectrum.

An integrated approach to MOUT is required in order to achieve victory in the future. This integrated approach states that through an examination and focus in the areas of doctrine, training, organizational design, technology, and the Warrior, U.S. forces will be best prepared for future MOUT. For the purposes of this paper, the term "Warrior" is defined as all individual combatants regardless of branch of service (i.e. soldier, sailor or marine).

Current and near-term MOUT efforts must also be examined. A thorough examination at ongoing efforts will assist in identifying what long term changes in doctrine, training, organizational design and technology are required to fight and win in future MOUT.

Historical Perspective

History has shown the MOUT environment to be an integral component of most military operations. Past conflicts have treated the area of operations as a battleground with restrictive maneuver limitations for mounted forces. Therefore, dismounted forces, augmented with functional support such as engineers, artillery, armor, and close air support, have dominated MOUT. These operations narrowly focused on closure and destruction of the enemy forces, sometimes involving massive collateral damage. Illustrative of such an operation was the Battle of Berlin (April--May 1945). A Russian soldier described the street to street fighting in the following manner:

> ***Deploying into assault squads and assault groups with each corps holding at least one division in reserve - the 3d Shock Units proceeded to lay down massive artillery fire, blasting away yard by yard, sitting guns in any open space and lining up the Katyusha rocket launchers to fire phosphorus into strong points and buildings, setting off fires***[i]

> ***Rather than fight for individual buildings, the tanks would go forward and blow them to pieces section by section, eliminating snipers. Sheltering civilians, huddled in basements and underground shelters, found themselves in the thick of this ferocious fighting, choking, blinded and maimed amidst the thunder of explosive charges or swept by the terrifying spurts of flame-throwers. Dragging the dead and dying out of the rubble at street level exposed the inhabitants to the sportive habits of Soviet airmen, diving down to rake streets, soldiers, fire fighters and anything that moved.***[ii]

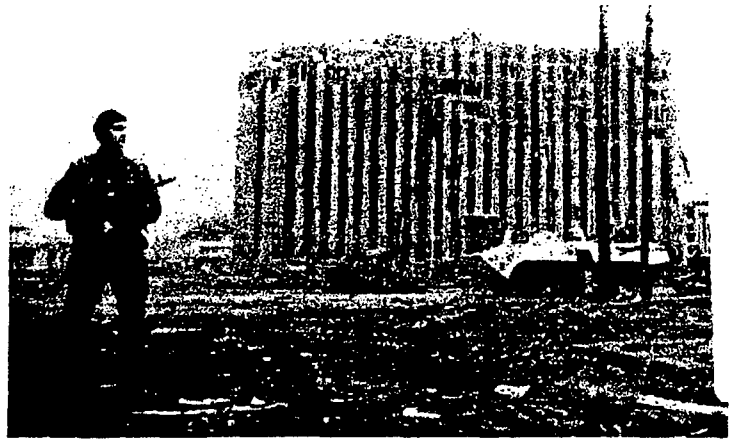
This description of MOUT warfare in World War II describes a less constrained era in the conduct of war. This mindset continued into the 20th Century.

> ***In the age of air power and of the missile-armed field army, it is inconceivable that any battle for a city will be fought through street by street, district by district, to the finish. The issue will be decided well before that time by the intervention of air bombardment and the most***

[i] Frederickson, pg. 583
[ii] Frederickson, pg. 583

destructive heavy weapons under the control of the field army, according to which side has command of the air. The fighting will end in the retirement or capitulation of one side well before the city can be half taken or, on the other hand, wholly re-won by the defending force.[iii]

Combat in MOUT today, by comparison, is characterized by such descriptive terminology as "surgical MOUT" (operations conducted by joint special operations forces--such as raids, recovery operations, and rescues), and "precision MOUT" (operations undertaken by conventional forces to defeat an enemy that is mixed with noncombatants).[iv] Both descriptive terms connote a concern for collateral damage that is conspicuously absent (and perhaps technologically unfeasible) from the preceding description of the street fighting in Berlin during World War II.



Characteristics of the Future. Future MOUT will embrace the full range of military operations, but will most likely focus on the lower end of the conflict spectrum.

The MOUT challenge of the future will not be meeting an enemy force on force. I can see situations where we will be required to use many or all of our offensive capabilities, but this will be the exception. This is not the environment of the future. We will be in the urban areas. Our problem is not that we have to conquer the urban areas as much as we may have to become

[iii] Marshall, pg. 31
[iv] FM 90-10-1

the city manager.[v]

Additionally, future operations predominately will focus on control of populations and territory by not only combat arms forces, but combat support and service support forces as well.

Technologically extended battlespace will manifest itself at the tactical level. Enhanced communications will translate into increased potential lethality making full-dimensional, simultaneous attack possible. Precision Engagement technologies will provide U.S. forces with a capability to strike at multiple locations, while ensuring minimal exposure of friendly forces. At the same time, employment of increasingly lethal weapons will be constrained by the scrutiny of players in the international media, international organizations, and individual political figures. The specter of excessive collateral damage witnessed by these players has become an issue made more visible by our own information technology advancements.

In future MOUT, "information technologies will be relied upon to increase the volume, accuracy, and speed as well as dissemination of battlefield information to commanders, allowing organizations to overmatch adversaries in this capability."[vi] Superiority in information technologies can be a two edged sword. The possession of superior informational capabilities does not automatically bring with it a parallel, embedded capacity to protect and sustain this advantage. This cautionary note is especially true of military applied information technologies which can trace many of their origins to "off-the-shelf" civilian hardware. These technologies are available, may be acquired by our enemies, and must be countered if so acquired.

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[v] LTG Zinni Interview, 5 Dec 96

Additionally, the proliferation of joint, multinational, and interagency information nodes in the face of extended lines of communications and finite security resources will broaden the vulnerabilities of such information facilities, systems, and functions. Sophisticated or unsophisticated threat forces can disrupt these information systems. Over-reliance on information technology will make U.S. forces vulnerable if appropriate counter-measures are not in place.

Stress on leaders, warriors, and staffs, precipitated by the intensity of MOUT, will remain a core issue into the 21st century. Overload of battlefield information precipitated by advances in technology will add to the burden of U.S. forces. Enlightened rules of engagement (ROE), supporting Rules of Interaction (ROI), force protection, (to include fratricide avoidance measures), and a clearly defined and achievable end, should help in mitigating against this stress.

[vi] TRADOC PAM 525-5, pg. 1-5

Future MOUT Threat Assessment

A future threat assessment is included at the appendix[vii]. This assessment examines threat and friendly force doctrine, training, organizational design and technology and defines the environment within which future MOUT will be executed. By doing so, comparisons between threat and friendly forces can be made. Several key elements are identified in the Threat Assessment. First, changes in Threat forces will occur in doctrine, training, organizational design and technology. These changes will occur over time and will be influenced by many factors. Second, likely future enablers for threat forces will be:

- Use of low technology Information Warfare (IW) to take advantage of U.S. force dependence on battlefield digitization
- Increase in night operations to minimize the effectiveness of U.S. Precision Engagement capability
- Optimizing use of restrictive ROE, the media element and non-combatants to further Threat objectives
- Improved Tactics, Techniques and Procedures (TTPs)

Finally, future Threat forces will continue to be more capable and will successfully challenge U.S. forces in future MOUT.

[vii] The Future MOUT Threat Assessment was a joint effort between the U.S. Army Infantry School Threat Office and the Author.

MOUT ACTD & SEA DRAGON ACTD - Complimentary and Required

Introduction. - To best understand the requirements for effective empoyment of U.S. forces in future MOUT, it is imperative to understand current efforts in support of near-term MOUT. For the purpose of this paper, near-term MOUT is defined from present to ten years hence; future MOUT focuses out to the year 2020. First, both the U.S. Army and USMC have individual combat development efforts in support of near-term MOUT. These efforts, the U.S. Army MOUT Advanced Concept Technology Demonstration (ACTD) and USMC Sea Dragon, focus on providing the MOUT Warrior with new and emerging technology to dominate the near-term MOUT environment. Second, it is important to note that while these efforts are service specific, they are not uncoordinated or isolated efforts. The MOUT ACTD and Sea Dragon programs are in fact, complimentary in nature. The MOUT ACTD focuses on the Joint MOUT Warrior in the tactical environment while Sea Dragon provides the ***Operational Context*** where maturing technologies, such as those resulting from the MOUT ACTD, can be tested and evaluated in a Joint and Naval Expeditionary force (NEF) operational setting. These initiatives will help prepare the Joint MOUT Warrior for near-term and future MOUT success.

MOUT Advanced Concept Technology Demonstration (ACTD)

Introduction. An ongoing major effort in support of the Warrior in future MOUT is embodied in the MOUT ACTD, spearheaded by the Dismounted Battlespace Battle Laboratory (DBBL), Ft. Benning, GA. The DBBL is a part of the U.S. Army's Battlefield Laboratories program under the direction of the U.S. Army's Training and Doctrine Command (TRADOC). The DBBL, like the other TRADOC Battle Labs, is chartered to experiment and evaluate new and emerging technology under its applicable battlespace domain. This experimentation is undertaken using the TRADOC tenets of Doctrine, Training, Leader Development, Organization, Materiel and Soldiers (DTLOMS). The DTLOMS experimentation approach ensures that the experimentation and evaluation follow a well rounded, holistic approach to warfighting.

Program Overview. The overarching objective of the MOUT ACTD is to improve the Warrior's operational ability to dominate the MOUT environment.

Furthermore:

> ***"The MOUT ACTD is designed to demonstrate the military worth of new technologies which when placed in the hands of Soldiers and Marines will increase their command and control capabilities, lethality and survivability. It will also set the stage for rapid acquisition of those technology applications which are deemed valuable by the users."***[viii]

The MOUT ACTD will accomplish this objective by identifying and evaluating new technology for relevance and insertion into the process to support the MOUT ACTD objective.

> ***The ACTD will be conducted in two iterations. Each iteration will consist of a two-year search for and initial demonstration of mature technologies to meet the user requirements, culminating in a series of***

[viii] Burgess, pg. 1

> ***field experiments to demonstrate the military value added of those capabilities. Following the field experiments will be a two-year residual period during which the experimental technologies remain with the experimental unit in order for that unit to finalize the associated Tactics, Techniques, and Procedures (TTPs) and other integration issues for that piece of equipment. The ACTD will execute the two iterations of experimentation (FY 97-98 and FY 99-00) each followed by a two year residual period. The first iteration will focus on mature technologies with the latter focusing on a full-spectrum MOUT capability.***[ix]

Throughout this experimentation process, some technologies will fail, concepts will be applied which will not work and other changes will be made. Following the successful identification and validation of candidate technologies, required changes in DTLOMS would be completed. This process of identification, experimentation, and insertion will be iterative. The MOUT ACTD, like the USMC Sea Dragon Initiative, is of a near term focus (10 years or less). While the focus of these two initiatives is near term, they will provide far-reaching and significant impacts on future MOUT warfare. The success of the MOUT ACTD will hinge on how well the DBBL can manage this unique process by identifying those technologies which will best support the Warrior in future MOUT.

Proposed Capabilities. The centerpieces of the MOUT ACTD are several technological areas of focus.[x] These areas of focus provide insight into how the MOUT ACTD will achieve its previously stated overarching objective. These areas provide a framework for experimentation and a vision of what the DBBL and the U.S. Army believe are keys to success in future MOUT.

[ix] Burgess, pg. 3
[x] Burgess, pg. 2-3

Increased Command, Control, Communications, Computers and Intelligence (C4I).

Requirements include:

- Enhanced awareness of friendly and enemy forces and non-combatants
- Disseminating information between Warriors
- Access to relevant information in the MOUT urban database
- Communications systems which operate effectively in MOUT environment to include inside buildings and other MOUT unique obstacles
- Decreased warrior load (i.e. pack load)

Increased Force Protection/Survivability. Requirements include:

- Survivability (Body Armor)
- Counter Mine capability
- Counter Sniper capability
- Non-lethal weapons
- Counter Mortar/Artillery
- Improved Structure Entrance/Breaching Tools

Increased Lethality/Engagement. Requirements include:

- More effective, MOUT-capable lethal weapons
- Development of organic precision munitions
- Development of universal/lightweight precision target designators

Conclusion. The MOUT ACTD spearheaded by the DBBL is a major component of the Defense Department's effort to drastically improve U.S. forces capability in the MOUT environment. This effort is not isolated. It has a direct link to the USMC Sea Dragon Initiative. Successes of the DBBL MOUT ACTD will go forward into the process. The DBBL has many partners in this effort. As the official Army lead agency, the DBBL must successfully integrate and focus the Joint combat developments community for the MOUT ACTD. This focus will produce the best possible package of MOUT technology, to include the DTLOMS considerations to support that technology.

The Sea Dragon Concept & The Sea Dragon ACTD

Introduction. The Sea Dragon Concept is the USMC's vision of warfighting in the 21st Century. Sea Dragon is a naval expeditionary concept applicable across the range of military operations and in all warfare environments.[xi] The Sea Dragon Concept is the vehicle through which implement the naval services' "Forward ... From the Sea Strategy" will be implemented. Sea Dragon provides the ***Operational Context*** where maturing technologies, such as those resulting from the MOUT ACTD, can be demonstrated in the setting of Joint and NEF operations. Its objective:

> ***"Remain relevant to a changing future by reshaping Naval Expeditionary Warfare within the Joint Warfighting Framework"***

Several key components and concepts are focused to directly support the Sea Dragon[xii]:

- Naval units, infused with emerging technology, conducting operations dispersed in breadth and depth across an extended seamless littoral battlefield
- A Command and Control paradigm which combines a new decision process with decentralized information dissemination to the user level
- Exploitation of long range fire and accurate indirect fires from mobile dispersed systems
- Utilization of enhanced mobility, survivability, communications and sustainment to execute a maneuver warfare approach, limit force exposure and gain a decisive advantage
- Employment of less than lethal technologies to increase the repertoire of tools and options available to expeditionary forces
- Exploitation of technology to leverage training and education in gaining increased depth of individual skill and unit capability

Sea Dragon has a 5-Year Experimentation Plan (5YEP) which includes a series of Limited Objective Experiments (LOE) and Advanced Warfighting Experiments (AWE) designed to support the overall Sea Dragon program by evaluating new and emerging

[xi] Commandants' Warfighting Lab (CWL) Home Page
[xii] Sea Dragon Overview Briefing

technology and concepts. The Commandants Warfighting Laboratory (CWL) spearheads this entire effort.

The CWL is the agency responsible for implementing Sea Dragon. The CWL, based at Quantico Marine Corps Base, is uniquely suited to implement this concept. The charter of the CWL is much like that of the DBBL. Both agencies are designed to experiment with new technology and concepts to support future warfighting requirements.

Program Overview - Sea Dragon

The 5YEP for Sea Dragon includes the following three major events:

Hunter Warrior - Small unit operations on a dispersed, open battlefield. Units conduct intelligence gathering and targeting. C2 by Special Purpose Marine Air/Ground Task Force (SPMAGTF) (X) CE. Target STARTEX - 3rd QTR 97.

Urban Warrior - Operations in urban, near urban, and close terrain. Units conduct intelligence gathering, targeting, maneuver, and close combat. C2 by MEF (Fwd) CE. Target STARTEX - 3rd QTR 1999

Capable Warrior - NEF (MEF/Fleet) level operations combining virtual and live forces comprising operational level deception and maneuver in response to crisis, with the objective of containing/obviating incipient MRC.

These events all have unique objectives, but all support the overarching Sea Dragon objective previously identified. This process will use a (SPMAGTF) as the experimentation force, which will allow for continuity throughout the five-year experimentation process. The SPMAGTF Headquarters element is permanently assigned to the CWL to ensure continuity of effort.

Several LOEs will be conducted in between and in support of the three major experiments just outlined.

Conclusion. The Sea Dragon Initiative spearheaded by the CWL is another component in our effort to dominate the future MOUT environment. The vision of USMC operations in the 21st Century is embodied in Sea Dragon. Their "quest for relevance" and acknowledgment of changing battlefield environments will ensure Naval Expeditionary forces are prepared to fight and win in the future MOUT environment.

Comparison of MOUT ACTD and Sea Dragon Initiative

The MOUT ACTD and Sea Dragon ACTD are individual service efforts to better define the near term MOUT environment and ensure U.S. forces dominate that environment regardless of foe and/or conditions present. The process used in both efforts accomplishes many of the key components likely for victory in future MOUT. These components include, but are not limited to:

- ***Holistic Approach***
- ***Direct Input from the Warrior***
- ***Increased use of Modeling and Simulation in support of experimentation***

By applying these components, U.S. forces will achieve victory in future MOUT.

Holistic Approach. Both the MOUT ACTD and Sea Dragon are heavily focused on technology for battlefield success in the MOUT environment. This focus, however, does not discount the importance of other factors for battlefield success. For example, the MOUT ACTD Management Plan clearly delineates the process to be used by experimentation units developing TTPs for each new system. These TTPs are of prime importance in the development of future doctrine. For example, the USMC's Sea Dragon program retains control of the C2 element of the SPMAGTF. By doing so, the CWL in the execution of Sea Dragon will be in a much better position to analyze and examine organizations and C2 issues in future warfare. These two examples illustrate how both the DBBL and CWL not only focus on technological enhancements to MOUT, but how other considerations such as Doctrine, Training, Leader Development, Organization, Materiel and Soldiers (DTLOMS) effect warfighting. Numerous other examples exist showing clearly that both the DBBL and CWL have an integrated, holistic approach of how to best experiment and determine what technologies will best support the Warrior in the near term

MOUT environment.

Direct Input from the Warrior One of the most important components of successful combat developments efforts is to ensure that the user has input into a system before it is fielded. During development of many past combat systems, "users conferences" have convened in which no user was present. Often, many of those in attendance had little or no military experience. In the case of the DBBL, the user input is the key to their success. Warriors from a variety of units such as the 82nd ABN Division and 101st AASLT Division provide experimentation personnel for DBBL Advanced warfighting Experiments (AWEs) and Battle Lab Experiments (BLEs).

Branch specific units are often used based on the type of experimentation being conducted. Military Police units and combat developers are often used during Non-Lethal Weapons experimentation due to MP expertise in that area. The U.S. Military Police Directorate of Combat Developments and the DBBL have a very strong relationship on Non-Lethal Weapons technology and other areas.

The U.S. defense community is not alone when it comes to fully integrating the user in the combat developments process. The following example provided by a combat developer from the United Kingdom demonstrates commonality amongst the combat development community.

> ***The lesson learned yet again at great expense is that you can't solve defence problems by simply throwing money at them, nor by only technology. It pays to have a few practical soldiers (or marines or airmen) around the place to keep people's feet on the ground.***[xiii]

The bottom line on experimentation with emerging technology is that user requirements must be met. These requirements cannot be achieved if the user is not an

integrated part of the process. Other factors such as senior officer/NCO participation, industry/contractor influences, available resources, etc., can often interfere with direct Warrior level input. The DBBL and CWL continue to ensure that Warrior level input is a key component of their respective experimentation programs.

Use of Modeling and Simulation (M&S) with Experimentation. The use of M&S is an integral component of both the MOUT ACTD and Sea Dragon. In most cases, M&S is used for a variety of purposes, but has one objective; to ensure the overall success of the effort. M&S provides:

- Analytical underpinnings in support of investment decisions
- Direct support for development of doctrine and TTPs

Analytical Underpinnings - Both the DBBL and CWL are optimizing M&S to provide concrete evidence of battlefield performance of emerging technology. New technology can be evaluated before bending any metal, thus preserving investment capital. Following favorable initial evaluation, further "field testing" can be conducted.

Intense scrutinization of performance is demanded by current and likely future resource constraints. Systems competing for scarce combat development funding must show their relative value against other systems. Model & Simulation is the approved method of showing the value of emerging technology. Without validated analytical underpinnings, which can best be provided through M&S, competing new technology will not be considered in the budgetary process. Both the DBBL and CWL have organic M&S capabilities in direct support of their MOUT efforts. Their use and expertise of M&S in support of future MOUT continues to play a predominant role in their respective

[xiii] Hogg, pg. 182

operations. Model & Simulation provide analytical underpinnings in support of investment decisions.

Direct Support for Doctrine and TTP Development - Model & Simulation provides both the DBBL and CWL with organic capability to conduct initial doctrine and TTP development for new and emerging combat systems. Current efforts of both the DBBL and CWL include the full instrument of organic MOUT "test bed" facilities to gather and collect user data during new technology experimentation. A key part of this experimentation will be the initial development of doctrine and TTPs for employment of the new technology. Users will be tasked to develop innovative methods of employment of new technology. Model & Simulation will play a crucial role in this process.

These uses of M&S in support of the MOUT ACTD and Sea Dragon recognize the great benefits which M&S can provide. Model & Simulation are especially important due to the ongoing decline in available resources. We have been forced to rethink older experimentation methods now that cost is considered as an independent factor in all major combat development decisions for investment. Model & Simulation provide us an effective tool to maximize available resources and to make the best possible future investment.

Conclusion. The steady decline of available resources coupled with the high operational tempo of U.S. force deployments in support of regional contingency operations makes it imperative that all branches of service synchronize their efforts. The MOUT ACTD and Sea Dragon accomplish this feat. For that reason, these initiatives are both complimentary and required. Through the successful execution and management of the MOUT ACTD. and Sea Dragon ACTD, future MOUT Warriors will achieve victory in the MOUT

environment.

Doctrinal Considerations for Future MOUT

Doctrine in support of future MOUT will have many similarities to current doctrine. Emerging technological advances and warfighting concepts will alter doctrine, but likely will not completely discard what is in place today. While U.S. force dominance at the higher end of the conflict spectrum is likely, several key factors concerned with the remainder of this spectrum will necessitate changes in doctrine. These factors are:

- ***Military Operations Other Than War (MOOTW) in Future MOUT***
- ***Infrastructure & Post Conflict Resolution***
- ***Digitization***
- ***Precision Engagement***
- ***Use of Non-Lethal Weapons***
- ***Rules of Engagement (ROE)/Rules of Interaction (ROI)***

Some of the MOUT battlefield functions associated with the use of combat arms such as offensive and defensive operations will change somewhat by advances in technology, organizational structure, etc. Regardless of what occurs, U.S. forces will have the organic capability to dominate the higher end of the conflict spectrum in the future MOUT environment. With this in mind, a discussion on how to better conduct primarily combat arms type functions is not required.

Technology will play an important, supporting role in future MOUT. It will be imperative that doctrine writers and others successfully integrate new technology into future MOUT doctrine.

> ***Dramatic improvement in the effectiveness of Military Operations in built-up Areas (MOBA) can be achieved by integrating existing and new technologies under operational doctrine developed explicitly for MOBA***[xiv]

As previously mentioned, the likelihood of high intensity conflict in future MOUT

[xiv] Defense Science Board Task Force on Military Operations in Built-up Areas (MOBA), pg. 2

will remain low. To that end, a discussion is required on how U.S. forces will best deal with the lower end of the conflict spectrum. The above listed factors primarily focus on this level of future MOUT.

Military Operations Other Than War (MOOTW). Military Operations Other Than War (MOOTW) encompass a wide range of functions for U.S. forces. These functions are relevant to all members of the Joint community and the combined arms team. Combat, combat support and combat service support expertise is required in MOOTW. The bottom line is that the likely environment for MOOTW is the MOUT environment. The future MOUT environment will likely require U.S. forces to be flexible in assuming many non-traditional functions.

> ***The U.S. military will likely find itself conducting these non-traditional functions (in MOOTW) mainly because no one else in the Area of Responsibility (AOR) has the organic capability to do so. These non-traditional functions will require us to use non-traditional TTPs. Future MOUT will likely be at the lower end of the conflict spectrum and will require us to be flexible, innovative and be prepared to perform non-traditional functions.***[xv]

> ***Joint doctrine must become broader and accomplish more of the lower end of the conflict spectrum.***[xvi]

The recognition by doctrine writers and senior leaders that MOUT and MOOTW are strongly linked will be an important factor in the success of future MOUT. By applying this relationship, future MOUT doctrine can be focused to include an emphasis on all levels of conflict.

[xv] LTG Zinni Interview, 5 Dec 96
[xvi] LTG Zinni Interview, 5 Dec 96

Infrastructure & Post Conflict Resolution Another area of importance in future MOUT is Host Nation (HN) infrastructure. Infrastructure should be defined as not only physical infrastructure, but can also include security, social, and spiritual infrastructure. Infrastructure therefore contains a number of elements, all which significantly contribute to the overall stability of a region or environment. Preservation of infrastructure can have a dramatic effect on the way the affected host nation and its' indigenous population views U.S. forces. Preservation of infrastructure (security, local government, and religious structures for example) can significantly lessen the danger to U.S. forces by instilling good will and minimizing the requirement to use U.S. resources to rebuild what has been destroyed. Rules of Engagement, Precision Engagement (PE) and minimization of collateral damage all contribute to this end.

Unique capabilities of individual participants likely will play an important role in future MOUT. One such example is the unique role played by Military Police. The following statement describes how Military Police expertise and training will likely affect future MOUT.

> ***The war is over and now you are cleaning the place up. There is still a security problem. There is a re-establishment of order problem. You will see a heavy infrastructure redevelopment meaning everything from the physical infrastructure (Water, sewer, ports, etc.) to the security infrastructure. This is a role for MP. You are going to have civil affairs, Psyops, heavy engineers, civil/military type organizations and others to help re-establish local infrastructure. This type of environment requires MP Battalions. ..... In an overall sense, Post Conflict Resolution is an ideal environment for Military Police.***[xvii]

Digitization. Digitization will provide the future individual Warrior the capability to see the battlefield in real time, communicate with leaders in all environments and act as a

[xvii] LTG Zinni Interview, 5 Dec 96

system feeding into the Precision Engagement network. These capabilities will make the future Warrior more effective in future MOUT throughout the entire range of military operations. When required, Warriors will provide leaders the capability of quick battlefield assessment, target prioritization, and elimination. At the lower end of the conflict spectrum, these organic digitization capabilities will allow leaders at all levels to get real time imagery of day-to-day activities in the future MOUT environment.

> ***As the Army moves toward terrain visualization in FORCE XXI, hard copy paper maps and products are giving way to a digital, information based system. The information based system provides digital maps and analyses which feed into the battle command systems directly, as well as indirectly through mission planning and rehearsal systems and simulations.***[xviii]

This increased capability to communicate down to the individual Warrior will significantly affect all aspects of future MOUT. Future Joint and service doctrine must ensure that the full impact of digitization is analyzed and incorporated. Digitization will be a key component of success in future MOUT.

Precision Engagement. Precision Engagement (PE) applies more to higher intensity conflict, but has application at all levels of future MOUT. It will provide U.S. forces the capability to selectively neutralize threat targets in all conditions while minimizing collateral damage and fratricide. On the higher end of the spectrum, PE likely will be a dominant characteristic of warfare.

> ***By 2020, real-time responsiveness of sensor-to-shooter systems will become a reality. For the first time in history, this responsiveness will allow the striking force to maneuver fires rather than forces over long ranges, and allow direct and simultaneous attack on many of the enemy's centers of gravity.***[xix]

[xviii] Military Operations Concept on topographic Support for Terrain Visualization
[xix] "Battlefield of the Future" pg. 3-10

At the lower end, PE will provide U.S. forces the capability to selectively apply force in the form of precision fire when required, with minimal risk of collateral damage. This surgical application of force will cause threat forces to frequently choose indirect offensive actions such as booby traps and snipers. Direct action in mass against U.S. forces will be minimized based on the possession of these PE capabilities.

Use of Non-Lethal Weapons. In direct correlation to ROE/ROI is the employment of non-lethal weapons in support of MOUT. Non-lethal weapons provide all warriors and leaders additional flexibility in the application of force. This added capability is especially relevant in MOUT. The MOUT environment is unique in the fact that it often has both combatants and non-combatants mingled in such a way that normal lethal means of force is not the ideal tool to achieve mission success. Therefore, the MOUT environment requires additional tools to ensure mission success. Warriors and leaders using non-lethal technologies will have the capability to control crowds, restrict movement of persons and vehicles, and better administer use of force. To best control crowds and individuals, non-lethal tools are required, which provide the individual warrior or team with mounted and dismounted employment capabilities. Future non-lethal technologies will provide warriors and leaders with alternatives to enhance control of both individuals and crowds in all environments—whether mounted or dismounted.

Rules of Engagement (ROE)/Rules of Interaction (ROI)

Rules of Engagement (ROE) are designed to provide the Warrior and leaders a framework for the application of force. Specific military operations require unique ROE and can be modified as the situation warrants. Their intent to be used as a control measure can be successful as long as the ROE are written in a manner that fully support

the mission objects, desired end state of the operation and the commander's intent.

A manifestation of human dimension skills is embodied in the formulation of ***Rules of Interaction (ROI)***.

> ***The need for ROI stems from the condition that rules of engagement (ROE), in many instances, do not adequately address interaction between soldiers and other operational players (joint, multinational, and interagency). The focus of ROE normally is towards the use of force by military personnel.***[xx]

Warriors engaged in the future MOUT environment must be familiar with the psychological as well as the physical environments likely to be encountered. Warriors' roles and actions in each of these environments must be detailed enough to address Warrior to player interactions supportive of the desired strategic end state. Rules of Interaction (ROI) predicated on interpersonal communication skills (IPC) fill this requirement and enhance the Warrior's persuasion, negotiation, and communications abilities.

> ***Rules of Interaction, supportive of ROE, serve to increase a Warrior's survivability by reducing the likelihood of incidents escalating to lethal confrontations. Specific ROI, provide the soldier with a tool to address non-traditional threats such as political friction, ideologies, and culture.***[xxi]

The development of ROI will necessarily involve input from other functional proponents such as civil affairs, PSYOP, legal, and Public Affairs to ensure that ROI are regionally and culturally specific and supportive of the strategic end state.

Conclusion. The development of future MOUT doctrine must remain an ongoing process. Senior leaders and doctrine developers must reassess continuously the relevancy of doctrine works in progress. Current indicators strongly point to the likelihood of

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[xx] Snyder, pg. 10

MOOTW type warfare occurring in the MOUT environment. With this in mind, both service and Joint doctrine must be developed which will maximize U.S. force dominance in the future MOUT environment. The above listed factors are some, but not all, of the unique items, which must be considered.

[xxi] Snyder, pg. 13

Training Considerations for Future MOUT

Future MOUT training will most likely have its roots based in current training practices. New warfighting concepts and emerging technology will directly affect future MOUT training. Individual and collective training requirements will continue to be identified, developed, and implemented in the Joint services. These training processes are not where the true challenges to future MOUT training will be found. The keys to training success for future MOUT will depend on other factors. These factors include, but are not limited to:

- ***Realism in MOUT training***
- ***Joint MOUT Training***
- ***Integration of Combat Developments and Concept Development Processes***

Realism in MOUT Training

Current practices for MOUT training attempt to provide the Warrior with realistic conditions in which to train. This attempt falls short in most instances. These failures include, but are not limited to:

- Unsophisticated and poorly simulated indigenous populations
- Inability to alter the environment in support of tactical employment
- A lack of MOUT unique distracters
- Pushing ***Mindset*** as part of the future MOUT experience

Correcting these failures in future MOUT training likely would have a profound effect on the expertise and success of Joint forces in future MOUT.

Unsophisticated Indigenous Population - A key element in successfully rendering a realistic MOUT environment rests in the accurate replication of likely indigenous populations. The key differentiation between the MOUT environment and other battlefield

environments is that the MOUT environment most often entails direct interface with an indigenous population. This population is often large and can have a significant impact on most military. For the MOUT environment to be truly realistic, the indigenous population must be accurately portrayed. Inaccurate portrayal lessens the training value of any MOUT training scenario and/or facility.

In order to accurately portray the indigenous population, MOUT training must first require role players to receive special training to ensure that they provide an accurate representation of a particular region of the world. Current practices often use poorly trained or untrained DOD personnel as role players to accomplish this task. Often times MOUT training includes only threat forces, without any indigenous population. Training must next provide region-specific role players for their facilities. The added realism provided by this process could make future MOUT training facilities ideal not only for MOUT training, but also for mission rehearsal. To accomplish this, role players should be trained to support multiple regions of the world such as the Middle East, Europe, etc. We must acknowledge the important component, which the indigenous population plays in future MOUT by ensuring that they are accurately portrayed.

Limited Ability to Alter the Environment - "Training as you fight" remains a bedrock principle of training. Current MOUT training facilities often are heavily restricted in what one may or may not do because of limitations imposed by local environmental factors, available resources or government regulation. Future training MOUT facilities must be designed in a manner, which lets the Warrior replicate the combat functions of the MOUT environment. These combat functions often include altering the environment through the use of explosives as a necessary battlefield function. The future Warrior must not have to

contend with whether or not it is proper to break a window in a MOUT training facility because his unit has to pay to have it fixed. Infantry forces training in future MOUT training facilities must have the opportunity to blow a hole in a building wall to enhance battlefield maneuver. The only focus of the Warrior in future MOUT training must be to the mission at hand. Future MOUT facilities must be designed so that the myriad of combat functions required can be practiced to the fullest extent possible -- to include the limited destruction of portions of the MOUT training environment.

MOUT Unique Training Distracters - Along with an accurately portrayed indigenous population, the physical MOUT environment must have realistic characteristics. These characteristics include streetlights, cars parked on the streets, traffic, windows in buildings, and normal urban activity (people walking down the street, traffic). Current MOUT facilities often have very few, if any of these characteristics.

Emphasize "mindset" as a part of the MOUT experience - Future MOUT training must incorporate the entire conflict spectrum, not just the higher end of the spectrum. Current MOUT training focuses on maneuver warfare but does little in regards to MOOTW. Recent MOUT experience has demonstrated U.S. forces often will be dealing with restrictive ROE and will be undertaking many non-traditional functions. Such restrictions and non-traditional functions in future MOUT likely will increase in the future. Future MOUT will require the Warrior to adopt a MOUT mindset in order to achieve success. In the past, the primary focus in MOUT has been on the physical destruction of the threat. Future MOUT Warriors must focus on the entire conflict spectrum.

Future MOUT training must incorporate better methods to training Warriors on the application of force. Commander's guidance and ROE provide some assistance in this

regard, but much more training is required. Combat arms forces are placed at a great disadvantage when confronted with the application of force in the dynamic MOUT environment at the lower end of the conflict spectrum. These forces are trained to "close with and destroy the enemy." Issuing restrictive ROE does not fix the dilemma for combat forces. They are still faced with a tough situation. Future MOUT training must include the opportunity for combat forces to train in the graduated application of force prior to having to do so in a real world contingency operation.

Joint MOUT Training. Currently, MOUT training is generally conducted within the respective services. Warriors would greatly benefit in future MOUT training if it was conducted in a Joint fashion. Recent contingency operations continue to place Joint forces in the MOUT environment. These Joint forces would have benefited greatly if Joint MOUT training had been conducted prior to an actual contingency operation. Real world Joint operations are not the ideal time to discover that interoperability problems existed such as incompatible communications assets or vastly differing TTPs for MOUT. These challenges could be minimized through Joint MOUT training.

The U.S. Army is currently allocating a significant amount of resources to the MOUT training facility located at the Joint Readiness Training Center (JRTC), Ft. Polk, LA. This facility when complete will represent MOUT training at its finest. Painstaking attention to detail, infusion of technology to provide real time data collection and After Action Review (AAR) capability are only two of numerous reasons why this facility is significant. With this capability, a strong case could be made to incorporate Joint MOUT training as part of the normal JRTC rotation. Currently, the primary mission of JRTC is train U.S. Army light forces. A portion of the training includes MOUT and MOOTW.

Incorporation of an USMC Warrior contingent into the normal JRTC rotation would provide an enhanced experience for both the US Army forces and USMC forces. It would also provide a great opportunity to further examine issues of MOUT TTP, interoperability and other Joint MOUT issues.

Integration of Combat Developments and Concept Development Processes

Technology will play a significant role in the success of the Warrior in future MOUT. The most efficient manner in which to ensure that the Warrior has the right technology is to involve the Warrior in both the combat development and the concept development processes. Recent downsizing of all Services within DOD coupled has limited such involvement. The bright spot on the horizon is work being conducted by both the Dismounted Battlespace Battle Lab (DBBL) and the Commandant's Warfighting Lab (CWL). These efforts are a road map on how to successfully bridge the gap between emerging concepts and technology.

Current combat development work being conducted by the DBBL is a showcase on the immediate and long-term positive effects of integration of the Warrior in both the combat development and concept development processes. The DBBL, as part of its technology experimentation, uses active component and reserve component warriors to conduct experimentation. Furthermore, it continually uses all branches of warriors in all Military Occupational Specialties (MOS) to conduct its experimentation. Part of this process involves the parallel development of concepts and TTPs by the warriors and leaders going through the experimentation. Through this integration of technology evaluation and concept development, the DBBL quickly identifies promising emerging technology along with applicable TTPs in tandem. The result is shortened development

time lines, putting the right technology in the hands of future Warriors. The CWL uses a similar process for Special Marine Air/Ground Task Force (SPMAGTF) for experimentation. In this case, the SPMAGTF's sole purpose is to conduct directed experimentation for the CWL in support of Sea Dragon. No other organization provides this tight integration of technology evaluation and concept development.

Conclusion. Future MOUT training will have its roots in the past, but will address the factors just discussed. Realism in training is an essential element in training effectiveness. Our ability to drive home important aspects of both individual and collective training is the key to the value of that training. Realism in future MOUT training must provide an accurate "feel" to the trainee and must force the trainee to become proficient in the task(s) being trained. Joint MOUT training is required to ensure interoperability, TTPs, Command and Control and other issues can be understood and resolved prior to the conduct of real world contingency operations. Joint training provides the vehicle to ensure continuity between all Joint forces in future MOUT. The DBBL and CWL are currently pioneering integration of combat developments and concept development processes. The potential insights and contributions to the materiel fielding process to be gained in this arena cannot be ignored. U.S. Joint forces in future MOUT will be best served if these factors are considered and acted upon in a timely fashion.

Organizational Design in Future MOUT

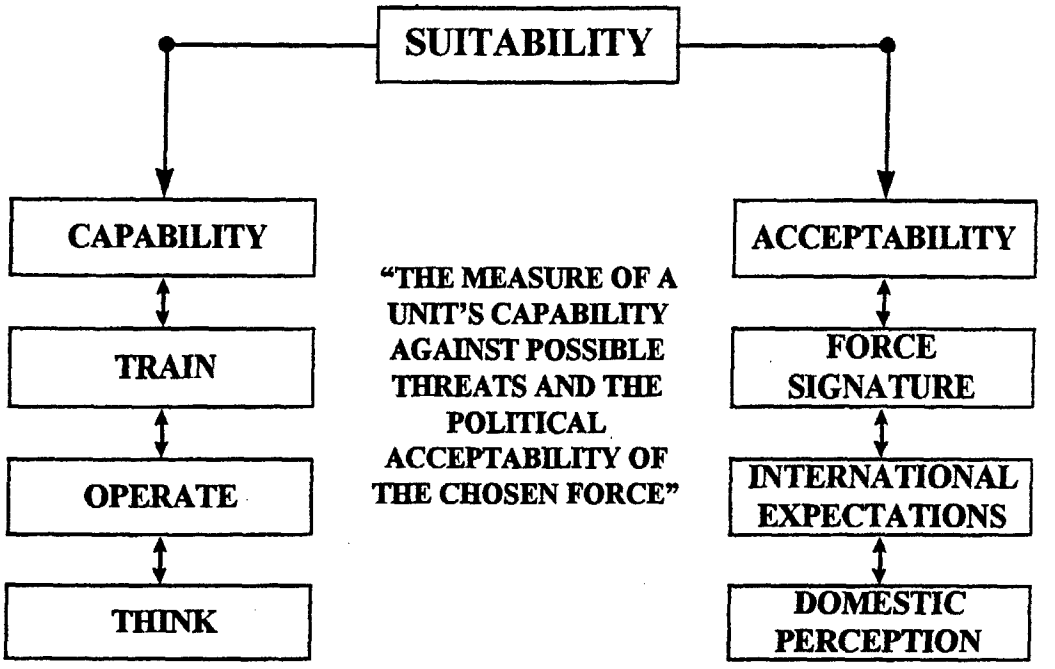
Recent contingency operations in the MOUT environment have shown that organizational success can be best achieved through force tailoring, often in a Joint fashion. Significant changes in organizational design likely are not required to achieve victory in future MOUT. Small Unit Operations (SUO) will remain the key to both tactical and operational success in future MOUT. The importance of SUO in MOUT can be attributed to the previously addressed likely level of war for future MOUT.

Efforts, such as Army Force XXI and Sea Dragon, will address future organizational changes. These efforts will examine the proposed threat, new battlefield systems, and other considerations to identify the optimal base force(s) required. In the end, the task force commander's primary method of ensuring organizational and mission success in future MOUT will be through effective force tailoring.

> ***The "Force Suitability Principle (FSP)" is a tool available to the military planner and leader when considering force tailoring for future MOUT. The essence of this principle recognizes that units should be chosen/tailored to meet a threat based upon an assessment of that unit's capability (predicated upon how that unit trains, operates and thinks) and the unit's political acceptability (predicated on the unit's force signature, the expectations of the international community, and the perceptions of the U.S. populace). After this assessment, feasibility constraints can be factored into the equation. The Force Suitability Principle should not only be applied in comparing branch proponent to branch proponent (i.e.; Infantry Vs MP), but also compare functions across the spectrum of joint and multinational operations. The Force Suitability Principle is embedded in several capstone level Army Field Manuals which include FMs 100-23, 100-7, and 100-16[xxii].***

[xxii] Snyder, pg. 15

Below is a graphic representation of the Force Suitability Principle:



Military planners and senior leaders will use force tailoring as a key component of future MOUT. The FSP provides a method to better evaluate units for their relative merits as part of a future MOUT force.

Technology in Support of Future MOUT

Technological innovation and advancements continue to be a primary focus for many as a method to overcome the fiscal realities of likely future conditions. While technology can have a significant impact on warfare regardless of battlespace or environment, it is not a panacea and must be approached with some caution. Mere possession of superior technological capabilities does not automatically bring with it a parallel and embedded capacity to sustain the advantage. Also, the MOUT environment physically negates the effectiveness of some types of technology.

> ***At the higher end of the conflict spectrum, you will see the value of technology and the value of traditional Tactics, Techniques and Procedures (TTPs) in MOUT. At the lower end, technology becomes less effective and the TTPs become less traditional.***[xxiii]

Historical examples abound of how technologically inferior forces have used innovations; timing or other means to defeated technologically superior forces. As previously discussed, the success of MOUT is directly linked to the success of the individual Warrior. Therefore, technology in support of future MOUT is best discussed using a "Warrior system approach." This approach will outline emerging technology from the individual level through systems used in support of future MOUT. The statement below illustrates the belief that new and emerging technology will play a significant role in future MOUT.

> ***The United States may need new technologies if it employs such tactics and seeks to maintain the lead that its forces possess in close combat. As advanced sensors and conventional weapons technologies proliferate and provide greater stand-off ranges for enemy forces, the United States should concentrate on achieving capabilities that will allow it to leap ahead of these developments. We need new means to enhance the***

[xxiii] LTG Zinni Interview, 5 Dec 96

lethality of our munitions and the protective characteristics of our materials and systems.[xxiv]

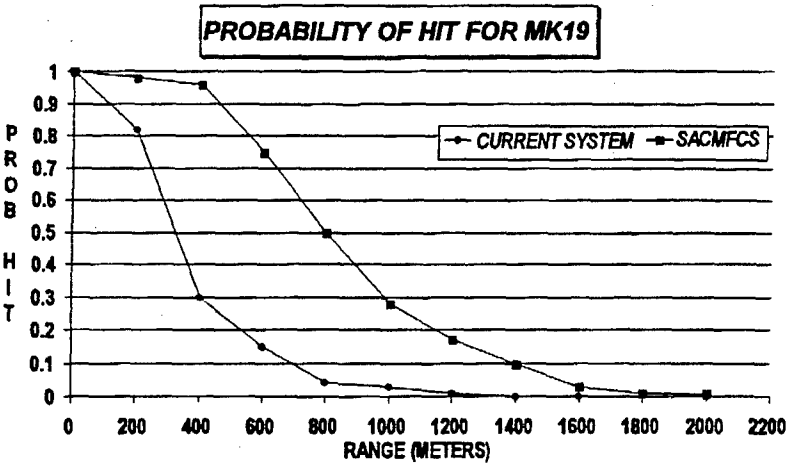
The Warrior in future MOUT will have unique requirements. The graphic below focuses on several key areas of concern. These areas will be discussed individually. Note that most of these areas are already being addressed by the Joint combat developments community, the Dismounted Battlespace Battle Lab (DBBL) as part of the MOUT ACTD effort or by the USMC under the Sea Dragon/Urban Warrior initiative.

LETHALITY

Small Arms Fire Control. Precision fire control is best described as a subset of precision strike, but for the individual Warrior. Full solution fire control in small arms systems has been successfully demonstrated in the Small Arms Common Module Fire Control System (SACMFCS) initiative under the Joint Service Small Arms Program (JSSAP). This technology has been thoroughly evaluated. The Small Arms Common Module Fire Control System (SACMFCS) program advanced development effort initiated in 1991 administered by the JSSAP Office at the Armaments Research Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ. During this time, SACMFCS was tested on numerous occasions by JSSAP technicians and the Joint services. These evaluations tested SACMFCS on both the MK19 and M2 .50 caliber MG. Significant performance gains in first burst-hit capability were demonstrated on both weapon systems.

[xxiv]"Battlefield of the Future" pg. 3-15

Below is a graphic depiction of the effectiveness of SACMFCS.[xxv]



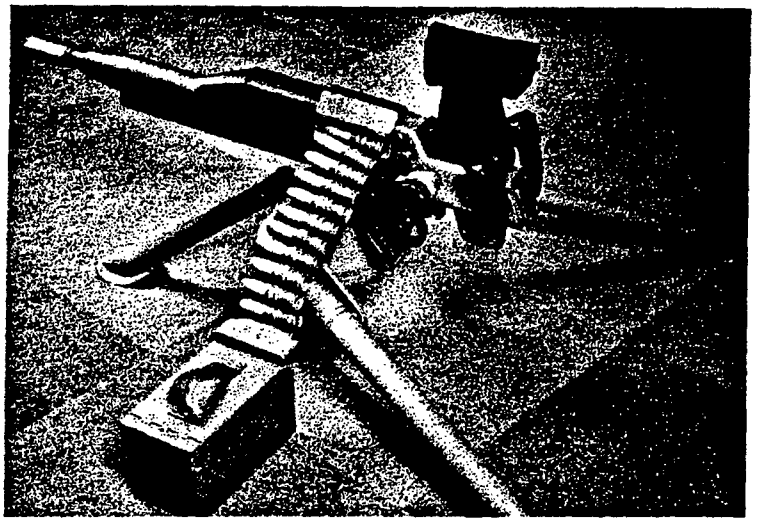
The SACMFCS prototype demonstrated the improvement which can be realized in first burst probability of hit (Ph) with full solution fire control. At 600 meters, the MK19 GMG has a .15 Ph (15% chance) for first burst. On the other hand, the SACMFCS prototype in testing gave the user a .75 Ph (75% chance) for first burst hit. This equates to an improvement of fivefold in first burst Ph.

The primary purpose of individual and crew served weapons fire control efforts is to increase lethality and survivability of friendly forces. Precision fire control reduces the expertise required to engage and destroy threat targets. This is especially important considering the highly stressful conditions experienced on current and future battlefields. To that end, the U.S. Army has taken the lead on the development of a new class of small arms and crew served weapons systems. These systems, outlined in the Army's Small Arms Master Plan, will incorporate full solution fire control with integrated all weather, all conditions capability. Their development and projected First Unit Equipped (FUE) fielding in the 2010-2015 time frame with fielding plans extending beyond 2015 provide us

[xxv] Mills, 5 Sep 95

a realistic glimpse of what kind of offensive systems the Warrior may carry.

Objective Crew Served Weapon (OCSW). The OCSW system is designed to replace both the M2 .50 cal Heavy Machine Gun (HMG) and the MK19 Mod 3 Grenade Machine Gun (GMG). The current system as proposed uses a 25mm high explosive air bursting munitions. Extensive use of lightweight/high strength materials and optoelectric full solution fire control are ideally suited to the requirements of ground forces in the 21st Century especially the MOUT environment. Inherent ammunition characteristics of OCSW reveal this system's ammunition fires munitions with a much flatter trajectory at comparable ranges. The net effect is a significant improvement in engaging moving targets. Below is graphic representation of this system:



The OCSW system will add significant combat capability to those operating in the MOUT environment for several reasons. First, as was previously addressed, the use of full solution fire control will minimize both collateral damage and ammunition consumption. Successful mastery of these two key battlefield considerations will ensure maximum effort is devoted toward defeating the threat versus sustaining the friendly effort. Second, OCSW

air bursting ammunition will provide decisively violent target effects and the capability to defeat defilade targets. Currently, neither the M2 .50 Cal HMG nor MK19 GMG can successfully provide these capabilities. Finally, through the use of lightweight, high strength materials, this system will have the capability to be dismounted with a significant decrease in manpower. The MK19 GMG with tripod currently weighs 144 lbs. The OCSW with tripod and fire control will weigh less than 40 lbs. The overall effect of OCSW in the MOUT environment is a quantum leap in lethality and survivability for the 21st century.

Shooter-to-Sensor Linkage - As previously discussed, the Warrior is now viewed as a combat system and, as such, will serve as an independent battlefield sensor package capable of becoming part of the Precision Engagement (PE). This capability for Warriors to act as "hunters" for the PE is embodied in the ongoing DBBL Rapid Force Projection Initiative (RFPI). This initiative is a complete architecture of Hunters and Killer systems which work together to form the ground based PE. Using advanced position navigation systems, sensors and Precision Guided Munitions (PGM) technology, RFPI will successfully integrate these assets into an effective and deadly PE. The advent of Global Positioning Systems (GPS) and PGMs will create the capability for the individual Warrior to bring lethal fires with pinpoint accuracy to any battlefield location regardless of the conditions. The concept of "if I can sense you, I can engage you" is coming to fruition. The relationship between the Warrior and the PE will grow stronger and more effective as time passes.

SURVIVABILITY

Non-lethal Weapons Technology. Non-lethal weapons provide all warriors and leaders additional flexibility in the application of force. This added capability is especially relevant in MOUT. The MOUT environment is unique in the fact that it often has both combatants and non-combatants mingled in such a way that normal lethal force is not the ideal tool to achieve mission success. Recent contingency operations in Haiti, Somalia and other locations have clearly demonstrated the usefulness of Non-Lethal technology. Therefore, the MOUT environment requires additional tools to ensure mission success.

> ***The addition of non-lethal weapons not only adds a new category in the force continuum, but also fortifies other categories previously regarded as having limited value. In the past, we typically would move directly from deterrence to combat, but with the addition of non-lethal weapons, we strengthen the potential for show-of-force and riot-control tactics.***[xxvi]

Future non-lethal technologies will provide warriors and leaders with alternatives to enhance control of both individuals and crowds in all environments—whether mounted or dismounted.

Warriors and leaders using non-lethal technologies will have the capability to control crowds, restrict movement of persons and vehicles, and better administer use of force.

> ***The show-of-force tactic is no longer an empty threat, because we now can escalate to the next level (on the use-of-force continuum) with the confidence that we can be effective without resorting to the use of deadly force.***[xxvii]

To best control crowds and individuals, non-lethal tools are required which provide the individual warrior or team, non-lethal employment capabilities.

[xxvi] No premium on Killing, pg. 27
[xxvii] No premium on Killing, pg. 27

Non-lethal systems will continue to evolve. Future non-lethal systems most likely will be an integrated capability of the Warriors' primary weapon. The delivery of non-lethal weapons technology by Unmanned Aerial Vehicles may be a common method of employment in future MOUT. Other non-lethal initiatives such as acoustic weapons, vehicle stoppers, entanglements and others will be developed and used in the future. Future non-lethal systems will provide Warriors additional options in the application of force in the MOUT environment.

Body Armor - There are many advocates for the use of body armor, and for good reason. Body armor, especially in MOUT environments, can provide the Warrior enhanced survivability at the time and place the Warrior chooses. Current body armor often is too heavy and cumbersome for long periods of sustained use. With current technology, the higher the threat level, the heavier the body armor becomes. Trade-offs have to be made with the current technology in body armor.

Future body armor may actually present itself in the form of a complete coverage defensive garment for the Warrior. Two challenges exist which make this concept difficult to achieve. First, finding a materiel, which is light, durable, and can withstand the kinetic force of threat weapon systems, is no small task. Even if the combat development community and industry find what they believe is an answer, threat systems can most likely counter the materiel fairly rapidly. Cost is another huge factor. The concept of finding body armor, which can defeat all threat systems, would most likely require considerable resources, and the continual decline of available resources make the prospect of fielding high tech body armor a challenge.

Stealth - Stealth technology continues to be an important element of most major combat

systems. Now that the Warrior has been defined as a combat system, stealth technology should be applied. Past efforts of placing infrared dye in the Battle Dress Uniform (BDU) and using camouflage face paint to provide a measure of stealth provide only minimal assistance to the Warrior in regards to stealth. The lethality of current and future battlefields requires us to provide the Warrior with an enhanced stealth capability. The U.S. Army has established the Soldier System Command (SSC) to take the lead in providing the individual warrior with the best possible tools for warfighting. The Army's acknowledgment that a separate R&D element focusing on warrior issues is of paramount importance. The move demonstrates the seriousness the Army now places on the "Soldier System." This individual Warrior focus is our best chance to continue to develop the type of soldier systems, which will ensure our success on the battlefields of tomorrow. Efforts of the SSC will provide the focus and commitment to Warrior issues such as stealth, which will be critical factors for future conflicts.

Digitization. Information technology continues to explode in terms of both complexity and capability. As it relates to warfighting, the capability to successfully assimilate the increased volume, accuracy, and speed of available information will provide a force with a decided advantage. An indicator of this capability can be seen in the proliferation of automation equipment. Portable computers are now being employed at all levels of command and support, and by individual warriors. Future Army plans for a digitized warrior include an individual warrior computer capable of processing battlefield imagery, communications with higher headquarters and even monitoring the current status of the users vital signs.

Below is a current version of the above mentioned warrior computer undergoing field-testing:

While this proposed system enhances acquiring and processing information, it also creates problems in dissemination and focusing that information for those best capable to act upon it.

Combat Identification (Combat ID) - Combat ID is critical to the success of future MOUT for several reasons. First, the American public opinion strongly supports any materiel technology efforts which will reduce or eliminate fratricide on the battlefield. Desert Storm and its intense coverage by the media was a revelation to the average American. . During Desert Storm, fratricide was a critical concern of U.S. ground troops. Many still believe that through the use of PGM and "smart munitions" U.S. forces have the capability to place lethality when and where we choose. Many also believe that we have the capability to apply technology to the individual warrior so that the risk of fratricide is significantly diminished. Second, the key difference between the MOUT environment and

other battlefield environment is the general proximity to non-combatants and the likelihood of collateral damage. MOUT requires precision fires to maximize success. Combat ID systems help ensure fires remain precision fires versus fratricide. Finally, MOUT is an arduous and logistics heavy battlefield environment, which requires all efforts to be focused toward the objective. Combat ID systems fully support that focus by helping ensure combat power is not wasted through fratricide.

The DBBL continues to aggressively pursue this initiative as part of its overall MOUT ACTD strategy. Its ongoing experimentation with the Battlefield Combat Identification System (BCIS) is yielding promising results. The capabilities embodied in BCIS address many of required capabilities required in future MOUT. Experimentation in this important area will continue with the ultimate goal to develop a combat ID system which will ensure that only threat forces are engaged and defeated.

Personal Protection Kit (PPK) - The concept of the PPK is a direct result of the ongoing DBBL MOUT ACTD effort. A series of user-level working group conferences identified the requirement for numerous Civilian-Off-The-Shelf (COTS) solutions for the individual Warrior. These items are generally low cost, high payoff items such as kneepads, goggles, gloves, hearing protection and other technologies, which are currently in use for similar purposes. The PPK would be a modular and expendable equipment package, which would provide the Warrior with a baseline set of tools for the MOUT environment. Over time as conditions in the MOUT environment change, the contents of the PPK could be changed to best support the needs of the Warrior.

Supporting Technology for the Warrior in Future MOUT

Unmanned Aerial Vehicles (UAV). Current and projected use of UAVs clearly shows this technology or other technology offering similar capabilities is here to stay. As UAV technology continues to evolve, it is becoming more reliable, less expensive and more capable. Recent use of UAVs in Bosnia demonstrates their value on the battlefield, especially in the MOUT environment. The following statements provide a feeling for the role UAVs are likely to play in future military operations to include MOUT:

> ***The promising initial results in deployments and previous exercises suggest UAVs will play an increasingly more important role in both land and maritime operations in the future. UAVs help close the sensor-to-shooter loop by providing the JTF and its components with the technology required to "see" the modern battlefield.***
>
> **J. J. Sheehan**
> **General, U.S. Marine Corps**
> **Commander in Chief, U.S. Atlantic Command**
> **August 1995**

> ***... I was looking at Predator [imagery displays] yesterday ... It was flying over an area ... at 25,000 feet. It had been up there for a long time, many hours, and you could see the city below, and you could focus in on the city, you could see a building, focus on a building, you could see a window, focus on a window. You could put a cursor around it and [get] the GPS latitude and longitude very accurately, remotely via satellite. And if you passed that information to an F-16 or an F-15 at 30,000 feet, and that pilot can simply put in that latitude and longitude into his bomb fire control system, then that bomb can be dropped quite accurately onto that target, maybe very close to that window, or, if it's a precision weapon, perhaps it could be put through the window.... I'd buy a lot of UAVs in the future.***
>
> **Admiral William A. Owens**
> **Vice Chairman of the Joint Chiefs of Staff**
> **June 1995**

The near term future procurement program for UAVs includes both tactical and operational level UAVs. Past experience with the use of UAVs has proven their relative

value on the battlefield. A family of UAVs is the future goal for U.S. forces. One of the most important lessons learned from the Persian Gulf War was the operational need for a family of UAVs, which the Congress reaffirmed.

UAVs are especially useful in MOUT. Their role in future MOUT has the potential to be even more substantial. UAVs as currently designed have numerous capabilities for military operations:

- Extended Reconnaissance - All weather, sustained intelligence gathering
- Precision Engagement - Act as a part of the precision strike network
- Communication Relay - Act as temporary communications relay platform

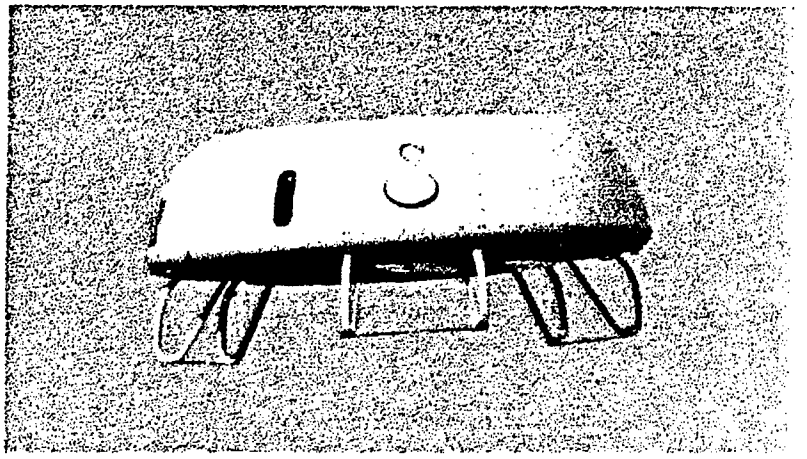
The 1994-1995 report on UAVs published by the Office of the Secretary of Defense (OSD) concurs with the prospect on increased UAV use in future MOUT.

> ***As mentioned, we are also discovering that UAVs can be ideally used in Operations Other Than War, and the idea of "urban reconnaissance" for military operations in built-up areas makes a strong case for future vertical take-off/lift capabilities.***

Future UAV use will provide UAV systems to both tactical and operational level commanders. This "layered" approach for UAV employment, which provides commanders access to UAV technology will a have significant impact on combat operations. Future MOUT will benefit from future UAV systems. The current approach for UAV employment fails to fully support future MOUT.

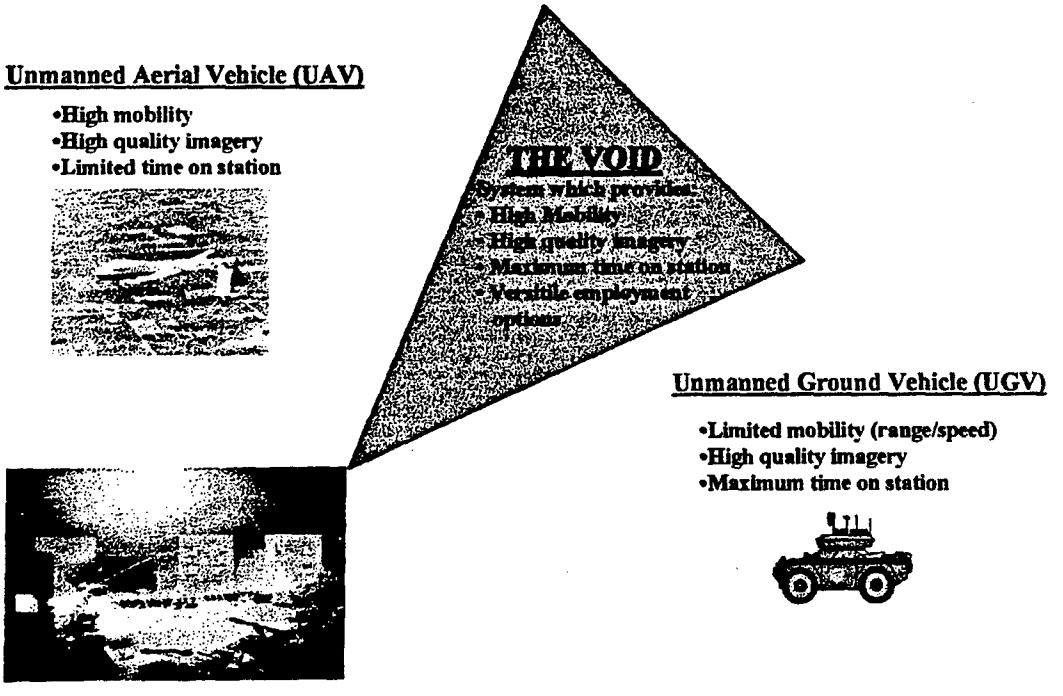
Highly mobile platforms, which can be used to deliver sensor packages, conduct crucial resupply and other MOUT related tasks are required. A possible solution to this deficiency is embodied in the Cypher program sponsored by Sikorsky. Cypher is not a UAV, but rather an airborne delivery system.

Below is the current operational prototype of Cypher:



In Future MOUT, a Cypher like vehicle could deliver a sensor package to a static location (top of building), deliver ammunition or other needed supplies. Its integration into the family of UAV fills a gap between the true UAV and the Unmanned Ground Vehicle (UGV), which is limited by its mobility and speed.

The figure below depicts the current gap which exists between the UAV and the UGV:



The CWL is currently conducting extensive experimentation in the area of UAVs. The X-Drone is the current UAV test platform for the CWL.[xxviii] This system is a low cost UAV that is not currently being pursued by any other service. Several other UAVs are under consideration by the CWL for future evaluation. The CWL is also interested in testing Kaman Aerospace's BURRO (broad-area unmanned retail resupply operations) UAV.[xxix] This system is designed to be an unmanned helicopter used for resupply. In this capacity, it would fill the earlier discussed role of Cypher. In either case, aerial resupply by UAV may become a reality in the future MOUT environment. It appears that the CWL plans to integrate UAV technology into all aspects of future MOUT warfare. Future MOUT will require more versatile and capable UAVs. Future UAVs may be used for a myriad of battlefield tasks to include the following:

- Resupply
- Relay and retransmission of communications
- Delivery vehicle for sensor packages
- Delivery vehicle for both lethal and non-lethal payloads
- Acting as a part of the Precision Strike capability
- Offensive Precision Strike
- Reconnaissance

Updated TTPs will be required to ensure these assets are best employed in support of future MOUT. For example, a mixture of high-flying UAVs such as today's Predator UAV along with a low flyer such as Cypher might offer the best combination for MOUT. The high flyers would provide precision strike capability, situational awareness and real time battlefield information. The low flyers could provide the close in detail piece in support of precision strike when collateral damage concerns were paramount. The low

[xxviii] UAV Update, Marine Corps Gazette
[xxix] UAV Update, Marine Corps Gazette

flyers also could be used to deliver static temporary sensor packages and communication relay systems in support of MOUT. This force tailored mix of high flyers (Predator Type) and low flyers (Cypher) would provide the on scene commander with the required capabilities for victory.

Conclusion. The success of MOUT is directly linked to the success of the individual Warrior. Several key points should be made about the role of technology in future MOUT. First, technology must be considered as something which supports the Warrior, not something that in itself is the key to victory. The current "Revolution in Military Affairs" will most likely make our Warriors capable in future MOUT. We must use and continue to develop technology to support the Warrior in future MOUT. We must not make the mistake of attempting to substitute technology as the prime instrument of success instead of the Warrior. Next, we must guard against over reliance on technology. The threat will use this over reliance against us to great advantage. Furthermore, we must train and equip our Warriors with the capability to revert to manual means when technology fails them in combat. Murphy will always be with us. The truth of the matter is that when GPS fails, if one cannot read a map or conduct terrain association to navigate, the ongoing operation will suffer. Finally, while systems such as UAVs, cruise missiles and other PE technology will most likely be available in future MOUT, the conflict will be decided by the individual Warrior in the MOUT environment.

Conclusion

Many things exist which effect our opportunities for victory in future MOUT. Emerging technology, organizational design and doctrine, for example, are unique components of warfighting in all battlefield environments--including MOUT. This paper has attempted to show the value of using an integrated approach to achieve victory in the future MOUT environment. Following an analysis of the likely threat force and environment, this approach focused on the forces of doctrine, training, organizational design, technology and the Warrior to provide an answer. The outcome is clear. While the above listed factors must be considered when planning for MOUT, the most important component of battlefield success in future MOUT is the Warrior. The importance of dynamic MOUT doctrine, organizational design optimized for MOUT, and technological advances should not be underestimated. Technology for example, directly affects lethality and survivability of US forces. These factors are *enablers*, which directly support the Warrior. The key to victory in future MOUT rests in how well senior leaders and the DOD community focus these enablers in support of the Warrior.

MOUT 2020 Threat Assessment

INTRODUCTION. This Threat Assessment provides an estimate on possible Threat forces that may be encountered in a MOUT environment to the year 2020. It outlines examples of Threat doctrine, training, organizations, and technology. While this assessment focuses on the Threat within a MOUT environment, MOUT is only one part of a more widespread Threat occurring throughout a given country. Several types of MOUT environments will continue to occur through the year 2020. Recent examples include Haiti, Lebanon and Chechnya.

Haiti represents the low end of the MOUT conflict spectrum. The Threat encountered was very low-intensity. It included disgruntled ex-soldiers, small special interest militia type forces, and random acts of criminal violence (looting, destruction of property, etc.).

Lebanon/Mogadishu represents the middle of the conflict spectrum. The Threat encountered in this area ranged from terrorist groups through organized tribal or religious militias. In Lebanon, there was both direct and indirect support from conventional military forces.

The low/mid portion of the conflict spectrum should not be equated with relative importance. These conflicts can be just as important and influential to a nation's strategic objectives as high intensity conflicts. United States forces remain in Haiti and were forced to leave Beirut after only one terrorist attack costing the U.S. a significant measure of prestige in the region and spurring on more aggressive actions by those adversaries to test U.S. resolve.

Recent operations in Grozny, Chechnya represent the highest level of intensity in

MOUT. Threat forces possessed many systems consistent with well-armed light infantry forces. These systems, while impressive, were not designed for decisive engagement with tank heavy forces. Threat forces were further strengthened because of their familiarity with that environment.

Future contingencies likely will be regional and in an urban setting. The scale, terrain, climate, indigenous culture, and character of the opposing forces will vary widely from case to case. The potential threats during this time will range from roving bands of insurgents through relatively well equipped regional forces to military powers. By 2020, regional conflicts may involve participants who threaten or use chemical, biological, or nuclear weapons. The threat or actual use of weapons, hostage taking or attacks on civilians, may be used by adversaries to constrain U.S. responses and sway public opinion.

Urban warfare is the most likely environment for conflict and will increase in the future. The ongoing movement of rural populations drives this to urban areas.

> ***A demographic upheaval of unprecedented proportions is today transforming almost the entire developing world - known during the Cold War as the Third World-from predominately rural society to an urban one. For the first time, because of unimpeded population growth and a related shift from rural-based to urban-based societies, more people live in cities in the developing world than in cities in the industrialized world. By the year 2020, the developing world will have accounted for 90% of the world's population growth since 1930.***[xxx]

> ***"Thus, the future killing grounds of the developing world will not be the impenetrable forests or remote mountain areas where guerrilla wars have traditionally been fought; rather, they will be the crowded, built-up areas in and around the less-developed world's burgeoning urban centers, whose residents will become inextricably enmeshed in insurgent-government conflict as rebels attempt to topple or replace existing governments.***[xxxi]

[xxx] Taw, pg. 1-2
[xxxi] Taw, pg. 7

Recent MOUT and MOOTW contingencies only reinforce the point that the United States is the only super power capable of assisting beleaguered, developing countries. We can only conclude that the U.S. most likely will be involved in many Military Operations in Urban Terrain (MOUT) which span the full range of military operations.

Doctrine. The immediate objective of Threat forces will be to assist a national effort to discredit the host nation's government and separate it from the US. Identifiable doctrine will vary based on many factors. Doctrine will also vary between and within identifiable groups, and will evolve as the U.S. operation continues. Threat forces will recognize that they cannot attack superior U.S. forces on an equal basis. There will be no doctrine that readily lends itself to association with any particular nation or military. Doctrine will be a product of prior military training, national characteristics, social mores, and of resident or "volunteer" Warrior groups.

Offensive. Threat force doctrine will stress seizing the initiative to pursue Threat objectives emphasizing the greatest number of enemy casualties with the greatest amount of media coverage (at selected places and times). The Threat will concentrate its operations from the ***"slumburbs"*** where the greatest support is likely to be found. The residential areas of the very wealthy will be high target areas this was demonstrated in the last FMLN offensive in San Salvador. Such targets will severely constrain the capability of U.S. forces to use their greatest advantage of air power and indirect fire. When possible the Threat will conduct special operations outside the built-up area including over international borders (Example: Chechen delivery of nuclear material into a Moscow park; Chechen taking of hostages outside Chechnya).

The Threat will attempt to use information warfare as a primary tool against U.S. forces. With a notebook computer, a "Techno-Warrior" who penetrates our "tactical Internet" will possess great potential to negatively effect U.S. force operations. As U.S. forces increase their reliance on digitization and C2, Threat forces will increase their efforts to use this reliance against U.S. forces. Threat forces will attempt to recruit Techno-Warriors in support of offensive operations. Techno-Warriors can operate in relative safety providing an economy of force t similar to a sniper.

Ambushes and raids will be common, generally in squad to platoon size elements. Targets will be undefended or lightly defended local government or military targets. As in the past, Threat efforts most likely will be against rear area targets, which are often in built-up or urban areas. Rear area targets are often less guarded than are other targets. The most common rear area targets are U.S. force and Host Nation logistics centers, which offer low cost and high payoff in materiel and psychological impact. Furthermore, such attacks against U.S. forces dependent on supply and maintenance will demand a commitment of combat troops to guard these sites. This increases the cost for U. S. forces and commits combat troops into fixed sites that can be isolated and destroyed. It establishes a long-term tendency to retake the initiative from a superior enemy force.

Small-unit night operations will be common. Threat units will attempt to maximize effectiveness through the use of sophisticated, man portable, night imagery systems. Much of this technology will be available to Threat forces from a multitude of sources providing an advantage to the Threat, even in the face of U.S. superior technology, based on an intimate knowledge of their "home" urban environment. Historically, potential enemy forces (local government and US) have minimized night operations to limit

fratricide and non-combatant casualties. Curfews, however, will not negatively affect Threat operations.

Future MOUT will require more dispersion by Threat forces in an attempt to minimize the likely Precision Engagement capability possessed by U.S. forces. Maneuver in the "urban canyon" will be most difficult for Threat forces. The Threat will use their in-depth knowledge of familiar terrain, night operations and Own the Night (OTN) technologies to be more effective in future MOUT.

Operations that might be considered defensive can be used in an offensive manner. Mines will be employed not just to produce casualties or harass, but also to channel enemy forces into prepared kill zones. Anti-aircraft ambushes with Surface-to-Air (SAM) and snipers will force the enemy to restrict flight operations, fly higher, or commit escort aircraft to every operation. Threat forces because of their proven effectiveness in past MOUT operations will maximize snipers. Mature, highly skilled Threat snipers will provide a stealthy, highly effective and devastating offensive capability. For Threat operations, snipers provide leaders a superb economy-of-force tool. Snipers will aggressively eliminate key targets and personnel to damage the local government's credibility.

There will be a tendency to use "harmless" non-combatants to achieve military and political results such as happened with the U.S. involvement in Somalia. The Threat will use peaceful demonstrations and/or protests to cover moving their forces. This shield could be used to conduct combat operations and produce U.S. and host nation casualties.

The Threat will have a keen awareness of the applicable ROE, which govern U.S. force operations. Threat forces will use this knowledge in a direct attempt to use those

ROE against us. Past MOUT and MOOTW have shown how effective Threat forces can use ROE in combination with the media to further their cause.

The Threat will adapt, as it learns what operations work and which do not. For example, the Threat will use command-detonated mines. When U.S. forces begin to use engineers to sweep, the Threat will ambush the personnel. When U.S. forces send reaction forces, they will be damaged or destroyed as in Mogadishu. Threat forces will attempt to get between U.S. forces and encourage fratricidal firefights. For example, in January 1995, there was a firefight between a Russian tank and a Russian motorized rifle unit, which lasted for six hours before the Russian units, could identify each other and establish a cease-fire.

Defensive. Threat forces will use the defense while in transition to offensive operations. The goal of the defense is to protect logistics/caches, inflict casualties, and embarrass the enemy government(s) through showing their impotence. The Threat will defend high value areas and likely will also defend from highly populated areas to limit any enemy's unrestricted use of artillery or aerial-delivered ordnance. While a large area defense such as the Palestine Liberation Organization (PLO) conducted in Grozny, Simon and Beirut will be less common it represents the high end of the conflict spectrum. Generally, the Threat will defend well-selected areas for limited time periods to accomplish limited objectives.

The Threat will defend according to a detailed plan of action. Selected buildings and areas will be strongpointed and organized for a 360-degree defense (also including aerial and subsurface considerations). The Threat will use all floors of the building and prepare routes of communication and escape by making holes in interior walls and digging

shallow communications ditches in open areas. They will use tunnels and sewers for movement as well as for important nodes (command posts, logistics sites, and hospitals). They will also use "off limits" sites (historic buildings, hospitals, orphanages, churches, etc.) for critical facilities knowing that the cost to the enemy of destroying these areas would be very damaging in the eyes of the world.

As was previously discussed in the offense, snipers will be key personnel in defensive operations. There will be two types of snipers. The first will be above average marksmen with no special equipment. The second will be above average marksmen or specially trained personnel who will have special rifles (hunting or sniper) with day and sometimes night-capable optics. They will target any personnel identifiable as leaders and key vehicle crewmen (commanders, drivers). Snipers with anti-material weapons will damage or destroy all robotic type vehicles realizing that these ground or aerial devices represent key reconnaissance assets.

Threat operations will seek to separate attacking combat vehicles from their accompanying infantry. They will use light and portable anti-armor ambushes to attrit the enemy whenever possible. They will carefully recon firing positions to ensure that minimum arming range restrictions will not hamper operations. They will integrate mines and barricades into the overall defensive plan to attrit, slow, divert, and separate enemy elements. Operations such as these were responsible for destroying 112 of 120 combat vehicles of the Russian 131st Motorized Rifle Brigade in January 1995 while engaged in operations in Grozny, Chechnya.

Local counterattacks and ambushes will be common, as will night operations. When the Threat is forced to abandon positions, it will generally leave one or more

personnel to cover the withdrawal of the main element. Personnel will expect to fight in isolation, a disadvantage overcome by thorough preparation (caches/log sites).

Intelligence will be an area of emphasis. Intelligence gathering in MOUT will depend primarily upon Human Intelligence (HUMINT) from supporters, infiltrators, translators, etc. Communications (conventional telephone and radio) intercept as well as computer exploitation will also be important sources of intelligence.

The Threat will possess the capability to make and deliver nuclear, biological and/or chemical munitions. There will be every attempt to be very specific in targeting (enemy troops, local ruling class). Collateral damage and damaging publicity situations will be avoided.

Psychological operations and media manipulation will be critical components of Threat doctrine. Media personnel will be carefully brought and protected when their "impartial" help is required and prevented from free movement as fits the needs of the Threat. The local government personnel and military will be specific high value targets for psychological operations as will the effort to alienate the local government and military from US forces.

Training/Leader Development. Training levels will greatly vary within the Threat. There likely will be three levels. The first and lowest level will occur within the supporters of the Threat. The second level will be seen among terrorist or militia type groups. The third and most proficient level will be among the Warrior class. In all cases, conducting actual operations will reinforce training. Training sites generally will be outside the city or outside the country and frequently funded by outside sources.

The supporters of the Threat will be poorly trained or trained in only specific areas

(intel gathering and reporting, mine laying, limited booby trap preparation and emplacement). They may have very limited weapons training. This group likely will support the Threat through the civilian occupations of its members (truck drivers, doctors, and communications personnel).

Terrorist or militia personnel will be well trained in small unit (team, squad) tactics, techniques and procedures but poorly trained in platoon and company operations. They will be proficient in the execution of small unit battle drills. Training in the use of small weapons (pistols, rifles, machine guns, grenade launchers, hand-held anti-armor weapons) and special devices (night vision devices, hand-held SAMs, mines, booby traps, mortars) will be detailed. Snipers will be specially selected and trained in weapons and Tactics, Techniques, and Procedures (TTPs). Training on heavier equipment (armored vehicles, crew served air defense weapons, and artillery) will be limited. These personnel will also be well indoctrinated politically and/or religiously. Leaders will be somewhat better trained than the rank and file. This training will not provide a strong basis in platoon or above operations.

The third and most proficient group will be the Warrior class including both local nationals and foreign personnel. A current example of foreign personnel is the presence of radical Islamic Muslim Iranian Mujahaden in Bosnia attempting to exert and maintain Muslim influence in the region as a countermeasure to U.S. and other Western influences. Future Threat forces will have received their training from conventional or special operations sources while in the military, or from other highly trained individuals. They will be proficient in individual weapons and TTPs through squad, platoon, company and sometimes battalion levels. An example of this class would be the Iranian Revolutionary

Guard Corps personnel who fought in Bosnia in the early 1990's. These Warriors trained (and indoctrinated) local volunteers, led local units, and/or integrated into local units.

Organizational Design. Threat forces will be organized along historical terrorist and guerrilla lines. The Threat generally will not mirror the downsizing trend caused by leaps in Command, Control, Communications, and Intelligence (C4I) and weapons effectiveness seen in Western armies. Operations security concerns will influence organizations. The command structure will be highly compartmentalized at middle and higher levels although the highest group may be highly public figures as was the case with General Dudayev (Chechnya) and Abimael Guzman (Sendero Luminoso, Peru). Organizations will vary among supporters, terrorists, guerrillas and the Warrior groups.

The supporters will be very loosely organized and will operate as individuals when called by their command structure. They will have a contingency organization for conventional operations consisting of squads, platoons, and companies.

Terrorists will be organized into small two-to-three-person cells at the lowest level. They will have the capability to combine cells into roughly squad size (7-12 personnel) elements and to operate in platoon size structures. These elements will have a common basis in training and experience but limited experience and capability in C3 at the platoon level. There will be no special weapons organizations.

Guerrilla type forces will be formally and more conventionally organized into infantry type squads, platoons, and companies. Special weapons squads and teams will exist within platoon, company, and battalion structures. These units will provide air defense (SAM and medium/heavy machine gun), anti-armor, and indirect fire (light/medium mortar) support. There may also exist (as in Chechnya) small teams or

squads of armored vehicles as shock or counterattack forces. Guerrilla organizations will function fairly well up to and including the company level. At and above the battalion level, organizations will not function well due to limited training and experience.

The Warrior class also will have conventional organizations. Squads (10-12 personnel) and platoons (34-40 personnel) will be organized with a clear and effective chain of command. Due to the limited numbers of this group, they will rarely operate at or above company level. Company level operations will be similar in organization and effectiveness to Chechen operations conducted outside the republic.

There will be a national or umbrella type C4I structure. There will be one overall leader with between one and three trusted deputies. Removing the head of the organization will result in a decrease in combat operations and then a resurgence along previous lines (as seen with the Sendero Luminoso and the Chechen resistance). There will be a staff organized into administrative/personnel, operations, training, intelligence, logistics, psychological operations, and political/religious sections. This structure will be mirrored in the Threat organization in cities.

Technology. As with all the Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers (DTLOMS) there will be large variations in weapons within the Threat. Small arms range from derringers and pistols to light machine guns. These will include a large mixture of origins and calibers with the most sophisticated types being foreign produced and the largest quantities being the types, which the local government uses. There will be an emphasis on small, easily carried and concealed automatic weapons with high rates of fire. The most common caliber will be the local government forces (to enable resupply through raids, theft, etc.) carry.

Medium weapons will range from medium machine guns through anti-armor weapons. The most common types will be those carried by the local government forces. Anti-armor weapons may be an exception if the Threat is supported by extra-national powers (Nicaragua's support of the FMLN in El Salvador). These could be soft launch, fire and forget weapons designed to defeat the best armor in the world.

Indirect fire weapons will range from home made catapult (FMLN type) explosive launchers through mortars and possibly local government artillery and MRL systems. Smart, terminally guided mortar rounds will be available in sufficient quantities to attack high value enemy targets. Both radio type proximity fuse rounds and "dumb" rounds to combat radio frequency weapons/jammers will be available. Incendiary munitions also will be used against specific targets.

Demolitions, explosives and mines will include everything from late 20th century versions to the most modern available on the world market. In an environment where the enemy will have tremendous technological advantages, old and unsophisticated devices such as simple booby-traps may have great value. 20th century type hand grenades will continue to be critical and heavily used devices.

There will be a variety of special weapons or specially modified weapons. These may include weapons with no flash and no acoustic launch signatures. Surface-to-Air Missile systems likely will have multiple proximity type warheads of greatly increased power. Threat forces will possess limited quantities of very sophisticated night vision/thermal type target acquisition sights. Laser/red dot devices will be common for small arms. Sniper rifles will range from conventional calibers into heavy anti-materiel calibers with munitions designed to penetrate targets and explode inside.

The Threat will use the entire spectrum of communications from couriers (memorized, or written and encoded messages) to sophisticated frequency hopping radios. Local telephones will be heavily used. The 2020 version of the Internet will be used to communicate outside the city and country as needed. Encryption will be manual and sophisticated.

Threat forces at all levels of organization will be capable of delivering NBC munitions. Nuclear material contamination will be most common although the Threat may use very small, very low yield nuclear devices against high priority targets (bridges, enemy C4I sites). Biological weapons will be race/ethnicity specific when possible (i.e. targeted against foreign/US personnel or the ruling ethnic group). Chemical incapacitants will be the most commonly used, mainly to disable enemy troops in non-lethal ways.

Directed Energy Weapons will include limited quantities of laser blinding devices and very small quantities of "hard kill" laser weapons. Crude acoustic weapons will be available in very limited quantities based on limited utility in MOUT environments.

Conclusion. The MOUT Threat will be dangerous, unpredictable and greatly varied in its training, material, and organization. Threat forces will use whatever means at their disposal to meet their objectives. Future Threat "enablers " to meet Threat objectives will be different from those of today. Threat forces will focus on low tech Information Warfare (IW) capabilities to take advantage on U.S. force heavy dependence on digitization. The Threat will actively recruit "techno-Warriors" to attack U.S. force digitization capabilities. Threat tactics will change to maximize the use of snipers in both offensive and defensive operations. Threat tactics will also emphasize the use of small unit operations during night and times of limited visibility. This will minimize the effectiveness

of U.S. force precision strike technology and to also capitalize on the Threat familiarization with its "home" terrain. Finally, Threat forces will use the media and an in-depth understanding of U.S. force ROE to maximize their effectiveness. Other key concerns will be the "high tech" materiel pockets of Directed Energy Weapons and Weapons of Mass Destruction. Most dangerous will be the Warriors who fight by no particular rules, certainly the rules of its foe.

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http://yorktown.dc.isx.com/mout/

The Center for Army Lessons Learned MOUT Page (CALL)
http://call.army.mil/call/homepage/mout.htm

The Operations Other Than War Center for Excellence- (Marine Corps)
http://www.ootw.quantico.usmc.mil/

MOUT Home Page
http://www.geocities.com/Pentagon/6453/index.html
One stop shopping for US Army field manuals, military manuals, orders, publications articles and briefings.

Army Doctrine and Training Digital Library
http://155.217.58.58/atdls.htm
U.S. Army Field Manuals (FMs) that address MOUT and MOOTW

Some relevant field manuals:

FM 90-10 Military Operations on Urbanized Terrain (MOUT)
http://155.217.58.58/cgi-bin/atdl.dll/fm/90-10/toc.htm

FM 90-10-1 An Infantryman's Guide to Combat in Built-up Areas (PDF)
http://155.217.58.58/cgi-bin/atdl.dll/fm/90-10-1/default.htm

FM 21-75 Combat Skills of the Soldier (Appendix D - Urban Areas)
http://155.217.58.58/cgi-bin/atdl.dll/fm/21-75/toc.htm

FM 7-98 Operations in a Low Intensity Conflict (Appendix A - The Urban Insurgent)
http://155.217.58.58/cgi-bin/atdl.dll/fm/7-98/f798.htm

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Operations in Urban Environments (Military Review)
http://www-cgsc.army.mil/milrev/English/JulAug98/groves.htm

Joint Publication 3-07: Joint Doctrine for MOOTW
http://160.149.101.23/djco/Pubs/jp3-07/index.htm

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http://call.army.mil/call/handbook/94-4/944toc.htm

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TC 90-1 Training for Military Operations on Urbanized Terrain (ADTDL)
http://155.217.58.58/cgi-bin/atdl.dll/tc/90-1/toc.htm

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http://www.geocities.com/Pentagon/6453/moutpoi.html
A user friendly, easy reference document for use in a unit's MOUT training program

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http://www-cgsc.army.mil/milrev/English/JulAug98/groves.htm

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http://www.wood.army.mil/TAD/MOUT/SECTION%201.HTM

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http://www.tradoc.army.mil/pao/strike.html

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http://www.afa.org/magazine/1298urban.html

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http://wwwcarlisle-www.army.mil/usawc/Parameters/99summer/hahn.htm

ADDITIONAL REFERENCES

Note: refer to the order form following the bibliographies for ordering information.

♦**AD**-A361891

ARMY WAR COLL CARLISLE BARRACKS PA

Protecting Our Own: Fire Support in Urban Limited Warfare.

DESCRIPTIVE NOTE: Research rept.

MAR 1999 51 PAGES

PERSONAL AUTHORS: Allen, Travis M.

UNCLASSIFIED REPORT

ABSTRACT: (U) The use of fire support in the urban environment during the conduct of Military Operations Other Than War (MOOTW) and limited warfare is made more difficult by the divergent interests of force protection and the requirements to limit collateral damage and non-combatant casualties. The concept of the "Three-Block War" and the urban battlefield is examined, as is the applicability of the laws of war. Two historical vignettes are discussed, involving fire support related incidents from the Israeli "Operation Grapes of Wrath" and the U.S. operations in Somalia. Future developments are discussed and conclusions are given.

DESCRIPTORS: *FIRE SUPPORT, *URBAN WARFARE, *LIMITED WARFARE, *OPERATIONS OTHER THAN WAR, MILITARY OPERATIONS, ISRAEL, MILITARY STRATEGY, BATTLEFIELDS, PROTECTION, SOMALIA, URBAN AREAS.

IDENTIFIERS: OPERATION GRAPES OF WRATH, THREE BLOCK WAR.

AD-A360813

HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA, VA

Evaluation of Dismounted Infantry Simulation Technologies (E-DIST).

DESCRIPTIVE NOTE: Rept. Mar-Sep 98

DEC 1998 75 PAGES

PERSONAL AUTHORS: Ford, Patrick; Andre, Charles R.

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the assessment of five simulators that train dismounted infantry tasks. Subject Matter Experts (SMES) worked through leader, soldier, or team scenarios and rated how well each simulator supported performance of subtasks related to military operations in an urban environment. The SMEs also identified characteristics to be considered for future simulators and modifications that would improve the current systems. The recommendations are the basis for characteristics to be considered in the Training Device Requirement for a Dismounted Infantry Module in the Close Combat Tactical Trainer.

DESCRIPTORS: *MILITARY OPERATIONS, *SIMULATION, *INFANTRY, *PERFORMANCE (ENGINEERING), *INFANTRY PERSONNEL, *MILITARY TRAINING, SIMULATORS, SCENARIOS, REQUIREMENTS, TRAINING DEVICES, ARMY PERSONNEL, CLOSE SUPPORT, COMBAT SUPPORT, TEAMS (PERSONNEL), MODULAR CONSTRUCTION, URBAN AREAS.

IDENTIFIERS: *DISMOUNTED INFANTRY, VIRTUAL ENVIRONMENT, MOUT (MILITARY OPERATIONS IN URBAN TERRAIN) DISTRIBUTED INTERACTIVE SIMULATION.

♦ Included in the DTIC Review, August 1999

AD-A360503

RAND ARROYO CENTER SANTA MONICA CA

Marching Under Darkening Skies the American Military and the Impending Urban Operations Threat.

1998 39 PAGES

PERSONAL AUTHORS: Glenn, Russell W.

UNCLASSIFIED REPORT

ABSTRACT: (U) Contemporary international and domestic security environments increasingly demand United States armed services and unified commands commitment to Military Operations On Urbanized Terrain (MOUT). The nation's soldiers and marines have been fighting in cities for much of the nation's history, but there is evidence that traditional definitions of success under such conditions may no longer apply. Success in accomplishing the assigned military mission can fall short of national political objectives if the cost of that accomplishment includes too great a loss of American or noncombatant life. This report provides an analysis of the U.S. Army's readiness to undertake modern MOUT missions; it also notes shortfalls in the nation's other armed services urban operations readiness as appropriate. This research was sponsored by the Office of the Assistant Secretary of the Army for Research, Development, and Acquisition and by the Deputy Chief of Staff for Operations and Plans and was conducted in the Force Development and Technology Program of the RAND Arroyo Center.

DESCRIPTORS: *MILITARY OPERATIONS, *OPERATIONAL READINESS, *URBAN AREAS, MILITARY STRATEGY, NATIONAL SECURITY, ARMY RESEARCH, COSTS, MILITARY CAPABILITIES, WAR GAMES, MILITARY PLANNING.

IDENTIFIERS: MOUT (MILITARY OPERATIONS ON URBANIZED TERRAIN).

AD-A360333

LOCKHEED MARTIN INFORMATION SYSTEMS ORLANDO FL

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JAN 1999 88 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) Implement a Simulation-Based Acquisition process that fully integrates the efforts of PMs, TACOM and the Mounted Maneuver Battle Lab throughout all phases in the development of future mounted Warfare systems.

DESCRIPTORS: *LAND WARFARE, *DISTRIBUTED INTERACTIVE SIMULATION, *COMBAT SIMULATION, LESSONS LEARNED, MANEUVERS, BATTLES, URBAN AREAS, BATTLE MANAGEMENT.

IDENTIFIERS: ADST (ADVANCED DISTRIBUTED SIMULATION TECHNOLOGY), MOUT (MILITARY OPERATIONS IN URBAN TERRAIN).

AD-A360043

NAVAL POSTGRADUATE SCHOOL MONTEREY CA

A Proactive Strategy Toward Terrorism and Transnational Crime.

DESCRIPTIVE NOTE: Master's thesis

DEC 1998 113 PAGES

PERSONAL AUTHORS: Hoyt, John R.

UNCLASSIFIED REPORT

ABSTRACT: (U) Terrorist and transnational criminal organizations are evolving into enormous national security threats. Their embrace of advanced information and communications systems has significantly enhanced their organizational efficiency as well as provided them with an exceptional disruption weapons system. The U.S.' heavy reliance upon the information infrastructure, along with the disruptive and destructive capabilities of cyberterror and cybercrime, have created a potentially very dangerous situation. In addition, the proliferation of advanced weapons systems into terrorist hands, including WMDs, requires the U.S. to reassess its counter-terror and crime policy. The current strategy in place to combat these entities is lacking, as can be seen by the World Trade Center and Oklahoma City bombings. The employment of an aggressive, proactive strategy that focuses on information operations is necessary to constrain these growing threats.

DESCRIPTORS: *POLICIES, *NATIONAL SECURITY, *TERRORISM, *CRIMES, WEAPONS, WARFARE, INTELLIGENCE, ORGANIZATIONS, STRATEGY, THREATS, WEAPON SYSTEMS, EFFICIENCY, THESES, COSTS, DATA ACQUISITION, COMMUNICATION AND RADIO SYSTEMS, INTERNATIONAL TRADE, ADVANCED WEAPONS, URBAN AREAS.

IDENTIFIERS: TRANSNATIONAL CRIME.

AD-A356656

ARMY RESEARCH LAB ABERDEEN PROVING GROUND MD

Modeling and Simulation of a Military Urban Robot Using Working Model.

DESCRIPTIVE NOTE: Final rept. Oct 97-Mar 98

NOV 1998 35 PAGES

PERSONAL AUTHORS: Haug, Bailey T.; Vong, Timothy T.; Von Wahlde, Raymond

UNCLASSIFIED REPORT

ABSTRACT: (U) The ultimate goals of the modeling efforts were to verify the capabilities of the design to negotiate obstacles, to provide feedback to the design process, and to assist in the development of control algorithms. Modeling was approached with multiple tools. Initially, a kinematics analysis of the vehicle helped in understanding the motion of the microrobot and provided insights for the modeling efforts. The microrobot was then modeled in both Knowledge Revolution Inc.'s Working Model (registered) 2-D and 3-D engineering simulation programs. Finally, Mechanical Dynamics Inc.'s ADAMS (registered) was used to develop a full engineering model of the microrobot to include control algorithms. To date, the modeling effort has focused on the ability of the microrobot to handle stairs. This was viewed as a crucial and significant challenge that must be addressed if the vehicle is to function in urban warfare. Working Model (registered) proved to be a powerful tool that enabled rapid examination of changes in parameters such as weight, center of gravity, strut lengths, coefficients of friction and restitution, etc.

DESCRIPTORS: *MANEUVERABILITY, *ROBOTS, *URBAN WARFARE, KINEMATICS, ALGORITHMS, COMPUTERIZED SIMULATION, MOBILITY, ROBOTICS, AUTONOMOUS NAVIGATION.

AD-A355932

ARMY RESEARCH LAB ABERDEEN PROVING GROUND MD

Gun Structural Dynamic Considerations for Near-Target Performance of Hypervelocity Launchers.

DESCRIPTIVE NOTE: Final rept. Jan 97-Jan 98

SEP 1998 31 PAGES

PERSONAL AUTHORS: Kathe, Eric; Wilkerson, Stephen; Zielinski, Alexander; Baz, Amr

UNCLASSIFIED REPORT

ABSTRACT: (U) In many settings, especially urban warfare, targets may be anticipated to occur very near the weapon platform, or behind concrete walls, much to the hindrance of missiles. Direct guns offer distinct advantages for near-target threats. Nonetheless, both accuracy and performance of long rod penetrators are affected by out-of-plane velocities as well as initial yaw and pitch rates for conventional antitank systems. These components are driven, in part, by the exit conditions of a projectile upon discharge from the launcher. By ignoring cost, logistics, and current technology limitations, these exit conditions may be corrected by smart projectiles, provided the duration of flight is sufficient in length for corrective action. Still, this luxury may not be permissible for near-target performance. It is therefore important in gun design to consider the structural dynamic performance of the launcher system to help mitigate pointing error and angular momentum of rounds upon shot exit.

DESCRIPTORS: *DYNAMICS, *TARGETS, *GUNS, *HYPERSONIC VELOCITY, VELOCITY, WEAPONS, YAW, PERFORMANCE (ENGINEERING), STRUCTURAL PROPERTIES, PROJECTILES, RATES, ACCURACY, TIME, COSTS, PENETRATION, PLATFORMS, ERRORS, LOGISTICS, WALLS, RODS, AIMING, LAUNCHERS, ANTITANK WEAPONS, URBAN WARFARE.

♦**AD**-A352261

MARINE CORPS COMBAT DEVELOPMENT COMMAND QUANTICO VA MAGTF WARFIGHTING CENTER

Urban Warrior Conceptual Experimental Framework Version 1-5.

APR 1998 54 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) The current Five Year Experimentation Plan (FYEP) is the cornerstone document for Marine Corps experimentation. It consists of three phases of experiments comprising the Warrior series. The initial Hunter Warrior phase of experiments, completed in the Spring of 1997, explored extended, dispersed battle space concepts. It investigated the contribution that an afloat, Marine Air-Ground Task Force (MAGTF) - enhanced with selected conceptual and technological improvements - could make at the operational level of war. Utilizing enhanced targeting, precision fires, C4I improvements and a limited deep operational maneuver capability, this force was able to shape the battlefield beyond current force employment options. Although intended as a proof-of-concept experiment employing a Special Purpose MAGTF, the results of the experiment were intended to have application in Marine Expeditionary Force-level operations as well.

DESCRIPTORS: *MILITARY OPERATIONS, *MARINE CORPS, *URBAN WARFARE, BATTLEFIELDS, TASK FORCES, AIR TO SURFACE, PRECISION, TARGETING, MILITARY TACTICS.

♦ Included in the DTIC Review, August 1999

AD-A350091

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS

From Seige to Surgical: the Evolution of Urban Combat from World War II to the Present and its Effect on Current Doctrine.

1998 137 PAGES

PERSONAL AUTHORS: James, William T., Jr.

UNCLASSIFIED REPORT

ABSTRACT: (U) This study investigates what effect the evolution of urban combat from World War II to the present has had on current urban combat doctrine. Urban combat operations have played a pivotal role in the conflicts of the twentieth century, and will continue to be a crucial part of future U.S. power projection operations. It is imperative that lessons learned from previous urban combat operations be studied for applicability to current doctrine. The study analyzes the battles of Aachen, Manila, Seoul, Hue, Just Cause, and Mogadishu to identify salient lessons for conducting successful offensive urban combat operations; then reviews current U.S. Army urban combat doctrine. The study then evaluates current doctrine using identified salient lessons to determine their effect. The study finds that the primary impacts of previous urban combat operations on current doctrine are that doctrine now embraces the idea of varied conditions for urban combat and validates the concept of fighting as a combined arms team in a built-up area.

DESCRIPTORS: *MILITARY OPERATIONS, *LESSONS LEARNED, *MILITARY DOCTRINE, *URBAN WARFARE, *SECOND WORLD WAR, WEAPONS, DECISION MAKING, ATTACK, TERRAIN, EVOLUTION(GENERAL), ARMY OPERATIONS, BATTLES, URBAN AREAS.

AD-A348640

NAVAL WAR COLL NEWPORT RI

Operation Peace for Galilee: An Operational Analysis with Relevance Today.

DESCRIPTIVE NOTE: Final rept.

13 FEB 1998 20 PAGES

PERSONAL AUTHORS: Thomas, Wilbert E.

UNCLASSIFIED REPORT

ABSTRACT: (U) The uncertain nature of future threats to U.S. forces presents interesting challenges to military planners. As the emphasis on the littoral environment and urban warfare continues, valuable lessons can be learned from Israel's swift and successful drive into Lebanon in 1982. Operation Peace for Galilee was epitomized by expert planning and operational excellence, as the IDF achieved its stated aim of establishing a PLO-free 40 kilometer buffer zone north of its border within 40 hours. Yet, as Defense Minister Ariel Sharon manipulated its conduct, the operation grew beyond the scope of IDF capabilities. By incorrectly identifying the PLO center of gravity as its military "fighters", the Israelis expanded their aims and found themselves in a two month siege of Beirut that resulted in mounting casualties and rising domestic dissatisfaction. The IDF was caught unprepared for urban warfare. Its heavy armor forces were more suited to the desert terrain of its previous wars, rather than the mountainous and urban terrain of Lebanon, which favored the defender. A planned 72 hour operation lasted 3 months and resulted in a 3 year occupation of Lebanon. While full of operational excellence at its outset, the operation protracted and ended in strategic failure and erosion of domestic support, resulting in the resignations of both the president and defense minister.

DESCRIPTORS: *MILITARY OPERATIONS, *JOINT MILITARY ACTIVITIES, *URBAN WARFARE, *OPERATIONS OTHER THAN WAR, LEBANON, CENTER OF GRAVITY, LESSONS LEARNED, PEACETIME, JET FIGHTERS, CASUALTIES, LITTORAL ZONES, DEFENSE PLANNING, ISRAELIS.

AD-A345882

ARMY WAR COLL CARLISLE BARRACKS PA

U.S. Policy and the Uncertain State of Military Usage of Riot Control Agents.

30 APR 1998 51 PAGES

PERSONAL AUTHORS: Brinn, Rufus T.

UNCLASSIFIED REPORT

ABSTRACT: (U) The U.S. military's international role includes the prospect of a continuing variety of operations other than war. Recent history tells us that to be considered successful such operations must not only meet political objectives, but must also unfailingly protect friendly forces while minimizing casualties among all parties. This paper examines the immediate and future requirement for effective non-lethal weapons, particularly chemical Riot Control Agents (RCA), to deal with the full scope of peacekeeping requirements. It also states the need for resolution of the current uncertainty regarding U.S. RCA policy and the necessity for RCA doctrine and training to address the challenges of operations within the world's growing number of urban areas.

DESCRIPTORS: *CHEMICAL WARFARE AGENTS, *RIOT CONTROL AGENTS, UNCERTAINTY, GLOBAL, TRAINING, GROWTH(GENERAL), CASUALTIES, INTERNATIONAL, MILITARY PLANNING, URBAN AREAS, PEACEKEEPING.

AD-A341961

OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING WASHINGTON DC

Defense Technology Objectives for the Joint Warfighting Science and Technology Plan and the Defense Technology Area Plan.

FEB 1998 599 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) Technological superiority has been, and continues to be, a cornerstone of our national military strategy. Technologies such as radar, jet engines, nuclear weapons, night vision, smart weapons, stealth, the Global Positioning System, and vastly more capable information management systems have changed warfare dramatically. Today's technological edge allows us to prevail across the broad spectrum of conflict decisively and with relatively low casualties. Maintaining this technological edge has become even more important as the size of U.S. forces decreases and high-technology weapons are now readily available on the world market. In this new environment, it is imperative that U.S. forces possess technological superiority to achieve and maintain the dominance displayed in Operation Desert Storm. The technological advantage we enjoy today is a legacy of decades of investment in Science and Technology (S&T). Likewise, our future warfighting capabilities will be substantially determined by today's investment in S&T.

DESCRIPTORS: *DEFENSE SYSTEMS, *MILITARY EQUIPMENT, *JOINT MILITARY ACTIVITIES, *MILITARY CRITICAL TECHNOLOGY, WEAPONS, COMBAT EFFECTIVENESS, INFORMATION SYSTEMS, COMBAT READINESS, INTEROPERABILITY, MILITARY CAPABILITIES, MASS DESTRUCTION WEAPONS, COUNTERTERRORISM, DETERRENCE, URBAN WARFARE, THEATER MISSILE DEFENSE, SMART TECHNOLOGY, TECHNOLOGY ASSESSMENT.

IDENTIFIERS: COMBAT IDENTIFICATION.

AD-A341688

SANDIA CORP ALBUQUERQUE NM

Surety Applications in Transportation.

JAN 1998 12 PAGES

PERSONAL AUTHORS: Matalucci, Rudolph V.; Miyoshi, Dennis S.

UNCLASSIFIED REPORT

ABSTRACT: (U) Infrastructure surety can make a valuable contribution to the transportation engineering industry. The lessons learned at Sandia National Laboratories in developing surety principles and technologies for the nuclear weapons complex and the nuclear power industry hold direct applications to the safety, security, and reliability of our critical infrastructure. This presentation introduces the concepts of infrastructure surety, including identification of the normal, abnormal, and malevolent threats to the transportation infrastructure. National problems are identified and examples of failures and successes in response to environmental loads and other structural and systemic vulnerabilities are presented. The infrastructure surety principles developed at Sandia National Laboratories are described. Currently available technologies including a) three-dimensional computer-assisted drawing packages interactively combined with virtual reality systems, b) the complex calculational and computational modeling and code-coupling capabilities associated with the new generation of supercomputers, and c) risk-management methodologies with application to solving the national problems associated with threats to the critical transportation infrastructure are discussed.

DESCRIPTORS: *NUCLEAR WEAPONS, *TRANSPORTATION, *RISK, *SECURITY, *RELIABILITY, *SAFETY, *INFRASTRUCTURE, LESSONS LEARNED, STRUCTURAL PROPERTIES, VULNERABILITY, SUPERCOMPUTERS, CATASTROPHIC CONDITIONS, TERRORISM, AWARENESS, URBAN AREAS, NATURAL DISASTERS.

AD-A339663

DEPARTMENT OF STATE WASHINGTON DC

Patterns of Global Terrorism 1996.

1996 72 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) Terrorism in 1996 continued to cause grave concern and disruption in scores of countries. Combating this menace remains a very high priority for the United States and many other nations. But finding clear "patterns" in this form of political violence is becoming more difficult. The Department of State's Annual Patterns of Global Terrorism focuses primarily on international terrorism involving citizens or territory of two or more states. It also describes but does not provide statistics on domestic terrorism abroad, which is an even more widespread phenomenon. The number of international terrorist incidents has fallen, from a peak of 665 in 1987, to 296 in 1996, a 25-year low. Moreover, about two-thirds of these attacks were minor acts of politically motivated violence against commercial targets, which caused no deaths and few casualties. Yet while the incidence of international terrorism has dropped sharply in the last decade, the overall threat of terrorism remains very serious. The death toll from acts of international terrorism rose from 163 in 1995 to 311 in 1996, as the trend continued toward more ruthless attacks on mass civilian targets and the use of more powerful bombs. The threat of terrorist use of materials of mass destruction is an issue of growing concern, although few such attempts or attacks have actually occurred. Finally, domestic terrorism, in countries such as Algeria, India, Sri Lanka, and Pakistan, appears to be growing and is more serious, in gross terms, than international terrorism.

DESCRIPTORS: *GLOBAL, *NATIONAL SECURITY, *TARGETS, *TERRORISM, *URBAN WARFARE, TERRORISTS, INDIA, DAMAGE ASSESSMENT, STATISTICS, THREAT EVALUATION, TRUCKS, EVASION, COUNTERTERRORISM, POLITICAL REVOLUTION, COUNTERINTELLIGENCE, COUNTERINSURGENCY.

AD-A335862

ARMY RESEARCH INST FOR THE BEHAVIORAL AND SOCIAL SCIENCES ALEXANDRIA VA

Selected Training Practices for Military Operations in Urban Terrain (MOUT).

DESCRIPTIVE NOTE: Final rept. Jun 96-Jun 97

SEP 1997 23 PAGES

PERSONAL AUTHORS: Sulzen, Robert H.

UNCLASSIFIED REPORT

ABSTRACT: (U) The Army and Marine Corps both consider Military Operations in Urban Terrain (MOUT) to be a central part of future training and together have a joint MOUT Advanced Concept Technology Demonstration (ACTD) underway. Training facilities for military and law enforcement agencies include firing ranges, mock towns or villages, and shoot houses. Makeshift facilities for dry fire drills include engineer tape staked out on the ground and rooms in any building available. Training in Close Quarter Combat (CQC) is offered in Army and Marine Corps training courses. Training time was mostly allocated to live fire and live simulation. Team dry fire drills were often extensively practiced before team live fire, but considered as a part of the safety training required as a part of live firing. Before team live fire training, Army units usually conduct individual marksmanship training. In many cases, standards were set for individual qualification before soldiers could participate in team live fire. Live simulation was both with the Multiple Integrated Laser Engagement System (MILES) and simunition.

DESCRIPTORS: *COMPUTERIZED SIMULATION, *ARMY TRAINING, *MARINE CORPS TRAINING, *URBAN WARFARE, MILITARY REQUIREMENTS, ARMY PERSONNEL, COMBAT READINESS, FIRING TESTS (ORDNANCE), JOINT MILITARY ACTIVITIES, MARINE CORPS PERSONNEL, ARMY OPERATIONS, MILITARY TACTICS, MARINE CORPS OPERATIONS.

AD-A331821

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS

Securing Failed Inner-City Communities: The Military's Role.

DESCRIPTIVE NOTE: Master's thesis 4 Aug 96-6 Jun 97

6 JUN 1997 129 PAGES

PERSONAL AUTHORS: Khan, Oral B.

UNCLASSIFIED REPORT

ABSTRACT: (U) This study examines the threat to internal security posed by violent gangs. This threat was found to be particularly acute in inner-city communities that have over time devolved to a status that the author classified as failed communities. Armed gangs had a very negative impact on the communities which housed them, resulting in a subculture regulated by gang rule. Civil authorities were found to be in breach of the social contract which required that, in return for the loyalty of citizens, they would provide that important social good--security--in accordance with the general will of the citizens. A literature survey identified indications of the failure of law enforcement agencies in the inner city. The security needs of inner-city residents were not accorded significant priority under the strategy of containment which was practiced. This made the police highly irrelevant for the security needs of residents caught up in the midst of the crisis. Analyzing the causes for the failures revealed weaknesses with the traditional assumptions behind national and internal security policy formulation.

DESCRIPTORS: *MILITARY PERSONNEL, *URBAN AREAS, STABILITY, POLICIES, NATIONAL SECURITY, ENVIRONMENTS, STRATEGY, PEACETIME, COMMUNITIES, THREATS, LITERATURE SURVEYS, SECURITY, FAILURE, MILITARY CAPABILITIES, OFFICER PERSONNEL, MILITARY PLANNING, LAW ENFORCEMENT, POLICE.

IDENTIFIERS: GANGS, INNER CITY.

♦**AD**-A331772

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS

Current MOUT Doctrine and its Adequacy for Today's Army.

DESCRIPTIVE NOTE: Master's thesis 4 Aug 96-6 Jun 97

6 JUN 1997 78 PAGES

PERSONAL AUTHORS: Nethery, Phillip T.

UNCLASSIFIED REPORT

ABSTRACT: (U) This thesis examines the adequacy of current Military Operations On Urbanized Terrain (MOUT) doctrine for current and future Army operations at the battalion task force level. This study outlines Army MOUT doctrine's development including and since World War II and the current state of Army MOUT doctrine. This study applies four tests to determine the adequacy of MOUT doctrine: mission, threat, terrain and technology. Each test involves the general question of whether or not our current MOUT doctrine gives the task force commander the sufficient tools to conduct the range of operations he may execute today or in the near future. Additionally, the study uses two historical vignettes to as lessons learned and another means of testing MOUT doctine. This study concludes that current Army MOUT doctrine is inadequate for current and future operations. MOUT doctrine does not give the task force commander the tools he requires to conduct the missions, evaluate the threat, analyze the terrain, or use the technology available to him in an urban setting.

DESCRIPTORS: *MILITARY DOCTRINE, MILITARY HISTORY, LESSONS LEARNED, BATTALION LEVEL ORGANIZATIONS, THESES, TERRAIN, MISSIONS, ARMY OPERATIONS.

IDENTIFIERS: MOUT (MILITARY OPERATIONS URBANIZED TERRAIN).

AD-A328001

RESEARCH TRIANGLE INST RESEARCH TRIANGLE PARK NC

Virtual Environment Technology for MOUT Training.

JUL 1997 164 PAGES

PERSONAL AUTHORS: Helms II, Robert F.; Nissman, Daniel B.; Kennedy, James F.; Ryan-Jones, David L.

UNCLASSIFIED REPORT

ABSTRACT: (U) Military Operations In Urban Terrain (MOUT) is an important component of land combat due to increasing urbanization throughout the world. The objectives of this study were to (1) evaluate the use of VE technology for training military personnel on MOUT tasks, (2) identify the behavioral issues associated with use of VE technology for training, and (3) identify previous attempts to simulate individual behavior in a VE. MOUT were analyzed to determine the applicability of VE technology for training both individual and team-level tasks associated with MOUT. The analysis considered candidate technologies, costs, trade-offs, alternatives, and expected changes in technologies over the next 6 years. The analysis focused on MOUT training tasks that were previously described in U.S. Army and U.S. Marine Corps training manuals, and in previous task analyses performed by other research and development organizations.

DESCRIPTORS: *MILITARY OPERATIONS, *LAND WARFARE, *PROTECTION, MILITARY PERSONNEL, ORGANIZATIONS, TERRAIN, COSTS, MILITARY TRAINING, MARINE CORPS TRAINING, INSTRUCTION MANUALS, VIRTUAL REALITY, URBAN AREAS.

IDENTIFIERS: MOUT (MILITARY OPERATIONS IN URBAN TERRAIN).

♦ Included in the DTIC Review, August 1999

♦**AD**-A326881

NAVAL WAR COLL NEWPORT RI CENTER FOR ADVANCED RESEARCH

Military Operations in Urban Terrain (MOUT): A Future Perspective for a Joint Environment.

DESCRIPTIVE NOTE: Final rept. NOV 96-MAR 97

FEB 1997 76 PAGES

PERSONAL AUTHORS: Mills, Stephen J.

UNCLASSIFIED REPORT

ABSTRACT: (U) Military Operations In Urban Terrain (MOUT) is the likely future environment facing Joint Task Force Commanders. This unique battlefield environment will require the best efforts of U.S. forces to ensure victory. An integrated approach to MOUT is required in order to achieve victory in the future. This paper states that through an examination and focus in the areas of doctrine, training, organizational design, technology and the warrior, U.S. forces will be best prepared for future MOUT. A future threat assessment is provided to serve as a baseline for comparison. The conclusion of the paper identifies the overarching importance of the individual combatant over other considerations such as organizational design, technology, etc.

DESCRIPTORS: *COMBAT READINESS, *URBAN WARFARE, MILITARY HISTORY, MILITARY DOCTRINE, BATTLEFIELDS, MILITARY CAPABILITIES, THREAT EVALUATION, JOINT MILITARY ACTIVITIES, CONFLICT, MILITARY TRAINING, MILITARY PLANNING, URBAN AREAS, BATTLE MANAGEMENT, OPERATIONS OTHER THAN WAR.

AD-A326722

NAVAL POSTGRADUATE SCHOOL MONTEREY CA

Urbanization in the Third World: Implications for ARSOF in the 21st Century.

DESCRIPTIVE NOTE: Master's thesis

DEC 1996 132 PAGES

PERSONAL AUTHORS: Davis, Kevin I.

UNCLASSIFIED REPORT

ABSTRACT: (U) The premise of this thesis is that urban warfare, or Military Operations On Urban Terrain (MOUT), should gain an increasing amount of attention among military commanders and policy makers as we enter in the 21st Century. This thesis will address urban operations that fall within the realm of conflict and the doctrine and training that prepares ARSOF to operate in this environment.

DESCRIPTORS: *DEVELOPING NATIONS, *URBAN AREAS, MILITARY OPERATIONS, STABILITY, THESES, CASE STUDIES, MILITARY PLANNING, MILITARY TACTICS, IRELAND, SPECIAL FORCES, URBAN WARFARE.

IDENTIFIERS: *URBANIZATION, *ARSOF (ARMY SPECIAL OPERATION FORCES), MOUT (MILITARY OPERATIONS ON URBAN TERRAIN), NORTHERN IRELAND, ALGIERS, MONTEVIDEO, SOCIOECONOMIC TRENDS.

♦ Included in the DTIC Review, August 1999

AD-A326622

ARMY WAR COLL CARLISLE BARRACKS PA

The Revolutionized Warfighter Circa 2025.

DESCRIPTIVE NOTE: Research rept.
MAY 1997 34 PAGES

PERSONAL AUTHORS: Jezior, Barbara A.

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper describes the technical evolution to a dismounted revolutionized Warfighter System by the year 2025. An enormous contributor to dominating maneuver, it will be critical for winning future battles. The technologies described comprise what the warfighter will wear, carry, and consume, and those which will improve sustainability, survivability, and command and control. The process is the Land Warrior program which promises numerous improvements, especially in the C4I, arena around the year 2000. The second major building block is the Military Operations In Urban Terrain (MOUT) advanced concepts technology demonstration which will produce major improvements in weaponry (lethal and non-lethal), C4I, small unit operations, combat ID, and sniper detection between 2003-2005. The author then outlines technologies achievable by 2025 that either build on MOUT technologies or offer radical breakthroughs. The paper concludes the Warfighter System should be a top military priority and that it merits special developmental structures and procedures.

DESCRIPTORS: *SURVIVABILITY, *COMBAT READINESS, *MILITARY MODERNIZATION, COMMAND CONTROL COMMUNICATIONS, MILITARY OPERATIONS, MOBILITY, MILITARY REQUIREMENTS, SNIPERS, LETHALITY, MANEUVERS, TECHNOLOGY FORECASTING, URBAN AREAS, BODY ARMOR, PERSONNEL DETECTION, BATTLE MANAGEMENT.

AD-A326510

ARMY WAR COLL CARLISLE BARRACKS PA

The United States Army's Preparedness to Conduct Urban Combat: A Strategic Priority.

DESCRIPTIVE NOTE: Research rept.

16 MAR 1997 34 PAGES

PERSONAL AUTHORS: WOOD, DAVID A.

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper will build a case for our need to prepare for future urban combat and make recommendations for conducting successful operations in this challenging environment, such as improvements to our urban combat doctrine, training priority and training facilities, leader development, force modernization, and organization for combat.

DESCRIPTORS: *URBAN WARFARE, MILITARY STRATEGY, TRAINING, MILITARY DOCTRINE, MILITARY MODERNIZATION, LEADERSHIP TRAINING.

IDENTIFIERS: *URBAN COMBAT, STRATEGIC PRIORITY.

AD-A326463

ARMY WAR COLL CARLISLE BARRACKS PA

Criminal Activity: The Future Threat to Our Nation's Security.

DESCRIPTIVE NOTE: Research rept.

APR 1997 36 PAGES

PERSONAL AUTHORS: Raggio, Paul A.

UNCLASSIFIED REPORT

ABSTRACT: (U) The Cold War saw the threat of superpower conflagration end, and with it, the notion of traditional warfare. America now faces an entirely different enemy. An enemy who operates within and outside its borders. He uses the inner cities as his battleground and conducts warfare through criminal activity. His multi-ethnic numbers are growing, fed by the disparate have nots. His organization mirrors the C3 structure and global reach of the most successful international business enterprises. He readily uses the latest technological innovations to sustain his livelihood. The new world order allows him to carry on his activities relatively unencumbered. His future appears bright because he does not have an adversary who can counter him. Traditional means of coping with his criminal activity will likely be overwhelmed. This enemy has the ability of becoming our nation's primary security challenge. Sweeping changes in the way we conduct jurisdictional law enforcement must be made. A multilateral effort, cutting across law enforcement jurisdictions, both nationally and internationally, to include the use of federal armed forces is required. A separate Unified Crime Control Agency should be created that integrates the various local, state, federal and Department of Defense agencies, which is linked to the U.N.

DESCRIPTORS: *CIVIL DEFENSE, *LAW ENFORCEMENT, *CRIMINOLOGY, MILITARY FORCES (UNITED STATES), NATIONAL SECURITY, MILITARY ASSISTANCE, THREAT EVALUATION, CIVIL AFFAIRS, URBAN AREAS, PUBLIC SAFETY, CRIMES, CRIMINAL INVESTIGATIONS, CIVIL DISTURBANCES.

AD-A325837

NAVAL WAR COLL NEWPORT RI

Urban Close Air Support.

DESCRIPTIVE NOTE: Final rept.

7 FEB 1997 19 PAGES

PERSONAL AUTHORS: Wilson, David L.

UNCLASSIFIED REPORT

ABSTRACT: (U) During the six years since Desert Storm, the media has gone to great lengths to portray the technological mastery of U.S. air power. News videos and television documentaries have fired a barrage of stories of how high-tech weaponry enabled 'surgical' strikes that won the war. Perhaps the wrong lessons have been taught too well, however. Future conflict and changing doctrine will likely pit pilots in a mission vastly different from the deep air strikes flown into Iraq. This paper looks at the need to conduct close air support in urban areas; a mission driven by the likely nature of future war (or potentially operations other than war) when married with warfighting doctrine that relies heavily on air support as a means of massing fires. Though the necessity to fight and win in any environment at any level may seem obvious, training and weapon procurement programs do not represent a future capability in urban close air support. For combatant commanders, operational success will depend on this and other critical tactical capabilities. They must, therefore, ensure that training and the planning, programming and budgeting system produce the proper warfighting tools.

DESCRIPTORS: *CLOSE SUPPORT, *AIR POWER, MILITARY OPERATIONS, IRAQ, KUWAIT, PILOTS, AIR STRIKES, TACTICAL AIR SUPPORT, PROCUREMENT, BUDGETS, MILITARY COMMANDERS, URBAN AREAS.

AD-A324460

NAVAL POSTGRADUATE SCHOOL
MONTEREY CA

Roles of the M1A1 Tank in the United States Marine Corps.

DESCRIPTIVE NOTE: Master's thesis

DEC 1996 84 PAGES

PERSONAL AUTHORS: Foster, James W.

UNCLASSIFIED REPORT

ABSTRACT: (U) This thesis analyzes the operations the Marine Corps' M1A1 tanks could perform in support of the Marine Air-Ground Task Force (MAGTF). The research addresses the current and future capabilities of the M1A1 tank employed by today's Marine Corps. Based on these capabilities, lessons learned from training and combat, and conclusions from working groups during the 1996 Armor Conference, analysis on the M1A1's role in the Marine Corps are presented. This research and analysis satisfies the need, established during the Armor Conference, to articulate the capabilities of the M1A1 and the operations it could perform or support. Numerous operations, such as operations other than war and military operations on urban terrain, which the M1A1 is not currently conducting or supporting are discussed, with the recommendation that the M1A1 be employed in these operations to improve the combat power of the MAGTF. Emphasis is placed on the M1A1's ability to conduct or support operations covering the full spectrum of warfare from high-intensity conflicts to peace keeping operations.

DESCRIPTORS: *TANKS (COMBAT VEHICLES), COMBAT EFFECTIVENESS, LESSONS LEARNED, TASK FORCES, THESES, TERRAIN, AIR TO SURFACE, MILITARY CAPABILITIES, CONFLICT, URBAN AREAS, MARINE CORPS OPERATIONS, PEACEKEEPING, OPERATIONS OTHER THAN WAR.

IDENTIFIERS: M1A1 VEHICLES.

AD-A324373

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

Attack Helicopter Operations in Urban Terrain.

DESCRIPTIVE NOTE: Monograph

20 DEC 1996 63 PAGES

PERSONAL AUTHORS: Jones, Timothy A.

UNCLASSIFIED REPORT

ABSTRACT: (U) Today's Army faces an environment much different from that which it prepared for in the Cold War. Massed armor battles, for which the Army was trained and equipped, have become much less likely while involvement in smaller and more limited conflict has become more probable. Future conflict is more likely to resemble Grenada, Panama, or Somalia than Desert Storm. As world demographics shift from rural to urban areas, cities can not be avoided as a likely battlefield, and have already played a prominent part in Army combat operations in the last decade. To keep pace in this changing environment, the Army must look to the cities when developing doctrine, technology, and force structure. Attack helicopters are inextricably woven into the fabric of combined arms operations. But for the Army to operate effectively as a combined arms team in an urban environment, both aviators and the ground units they support must understand the capabilities and limitations attack helicopters bring to the battle. To avoid the high casualties and collateral damage likely in an urban fight against a determined opponent they must train and prepare before they fight. This paper presents a historical perspective of how attack helicopters have already been used in this environment.

DESCRIPTORS: *ATTACK HELICOPTERS, *URBAN WARFARE, *BATTLE MANAGEMENT, MILITARY OPERATIONS, MILITARY HISTORY, COMBAT EFFECTIVENESS, STRATEGIC ANALYSIS, ARMY TRAINING, MILITARY DOCTRINE, CLOSE SUPPORT, BATTLEFIELDS, AERIAL WARFARE, MILITARY CAPABILITIES, ARMY OPERATIONS, ARMY AVIATION, URBAN AREAS, LIMITED WARFARE.

AD-A324335

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

Colossus on Main Street: Tactical Considerations of Heavy Armor and Future MOUT Doctrine.

13 DEC 1996 60 PAGES

PERSONAL AUTHORS: Lapham, Curtis A.

UNCLASSIFIED REPORT

ABSTRACT: (U) This monograph begins by reviewing the current status of United States land forces doctrine for Military Operations On Urbanized Terrain (MOUT) with an emphasis on the proposed role of the main battle tank. The monograph next presents four case studies of urban combat involving the use of the main battle tank. The studies used include: (1) Aachen, Germany 1944; (2) Berlin in 1945; (3) Hue City, Vietnam in 1968; and (4) Suez City in the 1973 Yom Kippur War. The purpose of these case studies is to determine the role of the modern main battle tank in urban warfare across the continuum of military operations ranging from peace enforcement to high intensity warfare. An analysis of these operations reveals the usefulness of the main battle tank across the entire spectrum urban warfare. The monograph concludes that the current doctrine fails to address the use of the main battle tank on urban terrain. The goal of this paper is to act as a catalyst for the Army to address this doctrinal shortfall.

DESCRIPTORS: *MILITARY DOCTRINE, *URBAN WARFARE, *TANK WARFARE, MILITARY HISTORY, COMBAT EFFECTIVENESS, MILITARY REQUIREMENTS, PEACETIME, STRATEGIC ANALYSIS, MILITARY CAPABILITIES, MILITARY APPLICATIONS, ARMY OPERATIONS, ARMY PLANNING, TANKS (COMBAT VEHICLES), URBAN AREAS, BATTLE MANAGEMENT.

AD-A319849

RAND CORP SANTA MONICA CA

Combat in Hell: A Consideration of Constrained Urban Warfare.

1996 65 PAGES

PERSONAL AUTHORS: Glenn, Russell W.

UNCLASSIFIED REPORT

ABSTRACT: (U) Armed forces are ever more likely to fight in cities as the world becomes increasingly urbanized. Accordingly, public and moral concerns about the costs of war borne by noncombatants increase as well. This report is a study of urban warfare and its challenges for U.S. armed forces constrained by having to minimize noncombatant casualties and collateral damage. America's armed forces are likely to have to confront the hell of urban combat. They have the potential to do so successfully. However, this environment's challenging character is unalterable; it will consume any force that fights unprepared. This study will be of interest to armed forces personnel planning for or conducting operations and training in urban areas. Other governmental and nongovernmental agencies considering policies involving dedication of military assets in urban contingencies will likewise find material of value in determining the risks and potential costs of such policies.

DESCRIPTORS: *MILITARY DOCTRINE, *COMBAT READINESS, *URBAN WARFARE, MILITARY PERSONNEL, POLICIES, OPERATIONAL READINESS, MATERIALS, COSTS, CASUALTIES, MILITARY PLANNING, URBAN AREAS, NONCOMBATANT.

IDENTIFIERS: MOUT (MILITARY OPERATIONS ON URBANIZED TERRAIN).

AD-A319750

MISSION RESEARCH CORP FOUNTAIN VALLEY CA

Phase 1. Development of an Urban Warfare Virtual Environment. Modeling and Simulation of Weapons Effects on Building Structural Integrity and Personnel for DIS Virtual Environments.

DESCRIPTIVE NOTE: Final rept. 5 Feb-4 Aug 96

30 SEP 1996 89 PAGES

PERSONAL AUTHORS: Eisler, R. D.; Chatterjee, A. K.; Vaske, D.; Burghart, G. H.

UNCLASSIFIED REPORT

ABSTRACT: (U) This effort will incorporate real time simulation of weapons effects into a DLS/HLA compatible urban warfare virtual environment. The Phase I effort identified key problems and relevant approaches for Phase II. Moreover, fundamental modeling and simulation issues which extend beyond the current application were addressed; i.e., how to embed modeling of physical processes (which is necessary if the objects in a simulation are to interact in a non-scripted manner) in real time visual simulations. During Phase I, a precision MOUT scenario for clearing a building was developed. This scenario included interior and exterior construction details, weapons and ammunition, soldier tasks an engagement ranges. Ballistic experiments were conducted on selected weapon target combinations to identify interactive dynamics, and provide data for texture maps and analytical models. A subreal-time code describing external and terminal ballistics of small arms was developed and correlated with experimental data. A stochastic model was developed to describe distribution of glass fragments from an incident blast wave.

DESCRIPTORS: *COMPUTERIZED SIMULATION, *REAL TIME, *VIRTUAL REALITY, *URBAN WARFARE, WEAPONS, MATHEMATICAL MODELS, PARAMETRIC ANALYSIS, STOCHASTIC PROCESSES, ARMY PERSONNEL, BLAST WAVES, TARGETS, EXPLOSION EFFECTS.

AD-A314668

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MILITARY STUDIES

Terrain and Intelligence Collection.

DESCRIPTIVE NOTE: Monograph

MAY 1996 62 PAGES

PERSONAL AUTHORS: Megill, Todd A.

UNCLASSIFIED REPORT

ABSTRACT: (U) This monograph looks at the current capabilities of division and corps Military Intelligence (MI) units and their ability to provide intelligence in differing geographic settings. The geographic environments considered include the general terrain and climate of desert, jungle, mountain, and urban areas. The hypothesis of this paper is that the constraints imposed by these differing geographic environments are at odds with the mix of collection and dissemination capabilities found in current MI organizations responsible for executing the intelligence cycle. The U.S. Army developed the tactical intelligence systems now in use to support high intensity combat operations against the Soviet Union during the Cold War. Since the disappearance of the Soviet Union and the rapid change in the world balance of power, the U.S. Army has had to make do with systems designed and procured for a struggle between superpowers. The interaction between terrain and climate often place different demands on MI units than those found in Central Europe. The way to increase tactical MI units' capabilities is to modify the current European-focused structures with a more flexible design. The proposed structure would keep the analytical, planning, and production capabilities in the division, but move the collectors to functionally-based battalions in an additional corps MI brigade.

DESCRIPTORS: *MILITARY INTELLIGENCE, *TERRAIN, USSR, INTELLIGENCE, BATTALION LEVEL ORGANIZATIONS, BRIGADE LEVEL ORGANIZATIONS, COLD WAR, DATA ACQUISITION, JUNGLES, URBAN AREAS, BALANCE OF POWER, TACTICAL INTELLIGENCE.

AD-A310991

OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING WASHINGTON DC

Joint Warfighting Science and Technology Plan.

MAY 1996 215 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) Since the Korean War, having the technological advantage has been a cornerstone of our national military strategy. Technologies like radar, jet engines, night vision, Global Positioning System (GPS), smart weapons, and stealth have changed warfare dramatically. Maintaining this technological edge has become even more important as the size of U.S. forces decreases and high technology weapons become readily available on the world market. In this new environment, it is imperative that U.S. forces possess technological superiority to ensure success and minimize casualties across the broad spectrum of engagements. The technological advantage enjoyed by the United States in Operation Desert Storm, and still enjoyed today, is a legacy of decades of wise investments in Science and Technology (S&T). Similarly, our warfighting capabilities 10 to 15 years from now will be substantially determined by today's investment in S&T.

DESCRIPTORS: *COMBAT EFFECTIVENESS, *JOINT MILITARY ACTIVITIES, *MILITARY MODERNIZATION, *TECHNOLOGY FORECASTING, *MILITARY DOWNSIZING, WEAPONS, ELECTRONIC WARFARE, GLOBAL, IRAQ, MILITARY STRATEGY, UNITED STATES, ENVIRONMENTS, MARKETING, RADAR, TERRAIN, JET ENGINES, GLOBAL POSITIONING SYSTEM, CASUALTIES, NIGHT VISION, KOREA, URBAN AREAS, COUNTERMINING.

AD-A310325

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

Power Projection Operations and Urban Combat: An Avoidable Combination?

DESCRIPTIVE NOTE: Monograph

14 DEC 1995 67 PAGES

PERSONAL AUTHORS: Boynton, Frank R.

UNCLASSIFIED REPORT

ABSTRACT: (U) This monograph addresses the relationship between power projection operations and urban combat. The facilities which are required for a power projection operation are typically located in urban areas. U.S. doctrine for urban combat is to bypass urban areas whenever possible due to the difficulty and cost of urban combat operations. The hypothesis of this monograph is that there is a conflict between U.S. force projection doctrine, which is based on the use of theater arrival facilities (typically located in urban areas), and U.S. urban combat doctrine. The monograph investigates whether Logistics Over The Shore (LOTS) offers a capability to conduct force projection operations while avoiding urban areas. It investigates whether the U.S. possesses adequate capabilities to conduct Logistics Over The Shore Operations, and what U.S. options are if such capabilities are not present. This monograph first investigates the nature of urban combat focused on historical examples. The examples include the battle for Hue, the Battle for Khorramshahr, the Battle for Manila, the Normandy Campaign, and the Battle for the Falklands. The monograph next investigates the U.S. doctrine for urban combat, with a discussion of both U.S. Army and U.S. Marine doctrine.

DESCRIPTORS: *LOGISTICS SUPPORT, *MILITARY DOCTRINE, *URBAN WARFARE, MILITARY HISTORY, LOGISTICS MANAGEMENT, OPERATIONAL READINESS, AMPHIBIOUS OPERATIONS.

AD-A308515

ARMY WAR COLL CARLISLE BARRACKS PA

Truman's Atomic Bomb Decision. An Attack on Japan's Center of Gravity.

DESCRIPTIVE NOTE: Strategy Research rept.

7 APR 1996 45 PAGES

PERSONAL AUTHORS: Johnson, Jerry D.

UNCLASSIFIED REPORT

ABSTRACT: (U) Truman's decision to use nuclear weapons to end the war in the Pacific is the subject of much debate. The purpose of this paper is to look at the debate between traditional and revisionist historian views on the subject and gain a better understanding of Truman's decision. The paper shows support for the theory that Truman's decision was appropriate because it was his best available option. It also shows that the Atom bomb actually attacked Japan's center of gravity, the will of the elite Japanese leadership team who administered the war. It did this while at the same time protecting what had become the United States center of gravity by the end of the war--the will of the people of the United States to continue a protracted, costly war.

DESCRIPTORS: *DECISION MAKING, *JAPAN, *PRESIDENT (UNITED STATES), *BOMBING, *BOMBARDMENT (ATTACK), CENTER OF GRAVITY, WARFARE, UNITED STATES, LEADERSHIP, MORALE, CASUALTIES, MILITARY COMMANDERS, URBAN AREAS, NUCLEAR BOMBS.

AD-A307554

NAVAL WAR COLL NEWPORT RI

The Vulnerabilities of U.S. Strategic Ports to Acts of Sabotage.

DESCRIPTIVE NOTE: Final rept.

12 FEB 1996 37 PAGES

PERSONAL AUTHORS: Grohoski, David C.

UNCLASSIFIED REPORT

ABSTRACT: (U) In an era where war is a 'come as you are' affair, the ramifications of arriving too late, or with insufficient forces could prove to be devastating. The recent bombings of the World Trade Center and in Oklahoma City shattered the myth that the United States is exempt from the effects of terrorism. The changing global security environment demands increase vigilance in guarding our vital institutions. The U.S. deterrent policy relies on power projection and the ability to get forces to areas of crisis in a timely manner. The U.S. deploys 95% of its supplies and equipment by sea. We can no longer assume that our domestic seaports are free from the effects of sabotage and terrorism. The U.S. seaports present an exposed target whose attack would serve to enhance the aims of any terrorist organization. It is conceivable that a single, violent act could shatter the balanced, time-sensitive U.S. deployment schedule. The vulnerabilities of our strategic seaports, which deploy and sustain our forces, demands a new sense of awareness on the part of the Department of Defense.

DESCRIPTORS: *VULNERABILITY, *TARGETS, *TERRORISM, *PORTS (FACILITIES), *STRATEGIC AREAS, DEPARTMENT OF DEFENSE, DEPLOYMENT, UNITED STATES, NATIONAL SECURITY, ENVIRONMENTS, CRISIS MANAGEMENT, EXPOSURE (GENERAL), VIGILANCE, THESES, AREA SECURITY, AIRPORTS, URBAN AREAS, DETERRENCE, BOMBING, SABOTAGE.

AD-A306951

RAND CORP SANTA MONICA CA

Force Requirements in Stability Operations.

1996 14 PAGES

PERSONAL AUTHORS: Quinlivan, James T.

UNCLASSIFIED REPORT

ABSTRACT: (U) Military requirements for the Post-Cold War environment are the central question of a large, somewhat disorganized, debate. The concept of conducting frequent and extended 'peace operations' has produced a significant effort to understand both their political context and their military requirements. One category of peace operations, interventions to restore and maintain order and stability, continues its prominence as current news and as a recurring theme in nightmare visions of the future. It is sometimes difficult to anticipate the force size and the time required to restore and maintain order in a failed or failing state. The force size is driven by two demographic revolutions of the last decades: dramatic growth in the populations of troubled states, and the movement of a considerable portion of that population to the cities. The movement from rural to urban settings is so significant that the populations of some cities exceeds that of many states. The duration of such operations is affected both by their inherent difficulty and by the implicit need in most cases to recreate internal forces of order.

DESCRIPTORS: *NATIONAL GUARD, *MILITARY REQUIREMENTS, *MILITARY STRATEGY, *PEACETIME, STABILITY, POLITICAL SCIENCE, SIZES (DIMENSIONS), DEMOGRAPHY, POPULATION, COLD WAR, URBAN AREAS, PEACEKEEPING.

IDENTIFIERS: PEACE OPERATIONS.

AD-A306945

RAND CORP SANTA MONICA CA

A Game of Urban Drug Policy.

1995 20 PAGES

PERSONAL AUTHORS: Kahan, James P.; Rydell, C. P.; Setear, John

UNCLASSIFIED REPORT

ABSTRACT: (U) We describe a 3-team seminar game of community governmental policy toward the sale and use of illicit drugs. The game takes 3 days to play and simulates roughly 5 years. The players are city and county officials and others active in community drug policy. A key feature of the game is a computer model that tracks the costs and benefits of enforcement, treatment, and prevention programs; the numbers of heavy and light drug users; and the amount of drugs consumed. We report the lessons learned from 4 runs of the game. These runs suggest that one can successfully conduct seminar games of a diffuse and long-term social issue such as local drug policy and that playing the game induces policymakers to pay attention not only to the immediate problems of drug abuse, but also to the surrounding community context. The design of the game is founded on the belief that psychological principles useful in the analysis of peace and conflict can be fruitfully applied to the 'war on drugs.' The lessons learned from the game highlight 3 principles used in conflict resolution: (a) increasing actors' awareness that the environment is mixed-motive rather than zero-sum, (b) avoiding the escalatory effects of oversimplified thinking, and (c) making explicit the underlying needs and values of the different actors.

DESCRIPTORS: *COMPUTERIZED SIMULATION, *POLICIES, *LESSONS LEARNED, *DRUGS, *PSYCHOLOGY, *PREVENTION, *URBAN AREAS, *DRUG USERS, *NARCOTICS, *DRUG ABUSE, WARFARE, SYMPOSIA, POLITICAL SCIENCE, COMMUNITIES, RESOLUTION, LONG RANGE (TIME), CONFLICT, DIFFUSION, BENEFITS.

AD-A304380

ARMY TRAINING AND DOCTRINE COMMAND FORT MONROE VA

Light Opposing Force (OPFOR) Tactics Handbook.

APR 1995 504 PAGES

UNCLASSIFIED REPORT

ABSTRACT: (U) TRADOC Pamphlet 350-17, Light OPFOR Tactics Handbook is the third volume of the capabilities-based Light OPFOR series of handbooks. This handbook provides the customer with a tactical overview of the Light OPFOR. The focus of the Light OPPOR Tactics Handbook is on the tactics of first-echelon truck-mounted, motorized infantry divisions and below, and how other arms, possibly including tanks, support them. For more detail on mechanized infantry and tank tactics, see the heavy OPFOR Tactics Handbook. The intent is to use TRADOC Pamphlet 350-17 with TRADOC pamphlet 350-15, Light OPFOR operational art handbook and TRADOC pamphlet 350-13, Light OPFOR organization guide. Any differences between the organizations in the Light OPFOR tactics handbook and the Light OPFOR organization guide are intentional. Future versions of the Light OPPOR organization guide will incorporate these changes. The intent of the Light OPFOR Tactics Handbook is to provide the trainer with a standardized flexible training opponent capable of stressing any or all battlefield operating systems of Light U.S. forces. It provides the doctrine to support potential orders of battle built from the Light OPFOR organization guide.

DESCRIPTORS: *MILITARY FORCES (FOREIGN), *TACTICAL ANALYSIS, *ENEMY, *HANDBOOKS, AIR DEFENSE, ELECTRONIC WARFARE, LOGISTICS SUPPORT, ARMY TRAINING, MILITARY DOCTRINE, INFANTRY, BATTLEFIELDS, NIGHT WARFARE, CAMOUFLAGE, COLD WEATHER OPERATIONS, COMMAND AND CONTROL SYSTEMS, MILITARY TACTICS.

AD-A302621

NAVAL AIR WARFARE CENTER WEAPONS DIV CHINA LAKE CA

Behavior Representation for the Team Tactical Engagement Simulator (TTES).

DESCRIPTIVE NOTE: Final rept.

NOV 1995 110 PAGES

PERSONAL AUTHORS: Lind, Judith H.

UNCLASSIFIED REPORT

ABSTRACT: (U) This study has been conducted to define typical battlefield behaviors for five groups of hostiles and neutrals who might be encountered in combat: (1) Standard Elite Troops, (2) Average Irregulars, (3) Isolated Criminals, (4) Frightened Civilians, and (5) Unfriendly Civilians. Results can be used in modeling computer controlled hostiles and neutrals (CCH/NS) in the joint Marine Corps - Navy Team Tactical Engagement Simulator (TTES), a deployable, flexible virtual reality training system. Military personnel and civilian law enforcement officers will use TTTES under a wide variety of simulated urban and rural situations to enhance marksmanship skills and to learn to discriminate among possible adversaries, to determine intent and level of hostility, and to decide whether to engage or withhold fire.

DESCRIPTORS: *TEAMS (PERSONNEL), *TACTICAL WARFARE, *VIRTUAL REALITY, *ROLES (BEHAVIOR), COMPUTERIZED SIMULATION, SIMULATORS, SCENARIOS, MILITARY PERSONNEL, DECISION MAKING, SKILLS, TRAINING DEVICES, BATTLEFIELDS, TARGET DISCRIMINATION, HUMAN FACTORS ENGINEERING, JOINT MILITARY ACTIVITIES, CONFLICT, WAR GAMES, JUDGEMENT (PSYCHOLOGY), PERCEPTION (PSYCHOLOGY), NAVAL TRAINING, MARINE CORPS TRAINING, MILITARY PSYCHOLOGY, URBAN AREAS, RURAL AREAS, COMBAT AREAS, REACTION (PSYCHOLOGY), MARKSMANSHIP, LAW ENFORCEMENT OFFICERS.

AD-A300998

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

MOUT Art: Operational Planning Considerations for MOUT.

DESCRIPTIVE NOTE: Monograph

23 MAY 1995 60 PAGES

PERSONAL AUTHORS: Preysler, Charles A.

UNCLASSIFIED REPORT

ABSTRACT: (U) This study considers whether there are specific operational level considerations for conducting offensive urban operations. A survey of the last several conflicts indicate the importance of cities. A worldwide trend toward urbanization and a realization that many cities are key or decisive to the attainment of operational or strategic objectives leads one to the conclusion that future military operations will involve the use of force or forces in an urban area. Despite the importance and likelihood of urban conflict, Army tactical doctrine continues to emphasize the avoidance of conducting MOUT. The facts suggest that avoiding built-up areas is no longer practical. Clearly, the U.S. must be prepared to fight this type of unavoidable combat. The American public demands that the U.S. conduct campaigns that result in quick, decisive victory at a low cost. The U.S. can reduce the costs, but cannot eliminate the costs totally. This paper then examines current doctrine for Military Operations On Urban Terrain (MOUT). Two historical reviews serve as examples of urban combat at the operational level. These historical trends are next compared with existing MOUT doctrine to assess its sufficiency.

DESCRIPTORS: *MILITARY OPERATIONS, *MILITARY PLANNING, *URBAN WARFARE, MILITARY FORCES (UNITED STATES), GLOBAL, LOW COSTS, MILITARY DOCTRINE, ATTACK, TERRAIN, COSTS, PLANNING, HISTORY, PATTERNS, ARMY, MILITARY TACTICS, URBAN AREAS.

AD-A300749

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

Standing at the Gates of the City: Operational Level Actions and Urban Warfare.

DESCRIPTIVE NOTE: Monograph

20 MAY 1995 59 PAGES

PERSONAL AUTHORS: Everson, Robert E.

UNCLASSIFIED REPORT

ABSTRACT: (U) The studies on modern urban warfare are preoccupied with the tactical problems associated with urban combat. Since World War II, conflicts in the urban environment have given modern armies complex problems which seem insurmountable. The tactical level emphasis attempts to circumvent the cost in time and resources normally associated with urban warfare. The operational commander who has responsibility for campaign planning and execution has considerable influence on the outcome of tactical urban combat. An assessment by the operational commander should clarify how a potential enemy may use urban terrain and what forces the enemy has to meet their objectives. When this evaluation is coupled with U.S. operational objectives, the importance of urban areas is evident. The six operational operating systems provide a good method for analyzing the major operation which will include urban combat. The operating systems have a synergistic effect on operational level warfare and their interaction has played an important part in tactical urban combat. The U.S. military has had numerous successes and failures in urban combat. Three such case studies are evaluated in this analysis. The operational level conditions established prior to tactical urban combat either facilitated or hampered tactical unit actions in each.

DESCRIPTORS: *URBAN WARFARE, MILITARY INTELLIGENCE, MILITARY HISTORY, MILITARY DOCTRINE, TERRAIN, CASE STUDIES, MILITARY PLANNING, MILITARY TACTICS, TACTICAL WARFARE, URBAN AREAS.

AD-A300041

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MIL ITARY STUDIES

Operational Art and Military Operations on Urbanized Terrain.

DESCRIPTIVE NOTE: Monograph

1995 67 PAGES

PERSONAL AUTHORS: Goligowski, Steven P.

UNCLASSIFIED REPORT

ABSTRACT: (U) This monograph examines the contemporary environment of Military Operations On Urbanized Terrain (MOUT) and explores key issues that the U.S. Army must resolve to improve its ability to conduct major operations in urban environments. From the analysis and discussion of these issues, the monograph draws conclusions about the sources of these issues and makes recommendations for implementing possible courses of action to resolve the issues. The monograph begins by examining the social, military, economic, and political forces that create the contemporary MOUT environment. The research data examined in the monograph indicates that MOUT is becoming both more frequent and a more decisive component of contemporary warfare. The monograph next discusses how the U.S. Army has traditionally approached the conduct of MOUT. It finds that current U.S. MOUT doctrine can be traced directly back to the lessons learned in Europe in World War II. The Army has placed little emphasis on changing or updating MOUT doctrine since that time. Next, three case studies are presented that illustrate three types of urban conflict the U.S. can expect to face in the future: Combat against conventional forces, peacekeeping/peacemaking operations, and aid to civil authorities.

DESCRIPTORS: *MILITARY OPERATIONS, *URBAN WARFARE, EUROPE, CENTER OF GRAVITY, EXPERIMENTAL DATA, ENVIRONMENTS, LESSONS LEARNED, THEORY, TERRAIN, CASE STUDIES.

AD-A299942

NAVAL POSTGRADUATE SCHOOL MONTEREY CA DEPT OF OPERATIONS RESEARCH

Battlefield Behavior of Neutrals and Hostiles: Models for the Team Tactical Engagement Simulator (TTES).

DESCRIPTIVE NOTE: Technical rept.

SEP 1995 105 PAGES

PERSONAL AUTHORS: Lind, Judith H.

UNCLASSIFIED REPORT

ABSTRACT: (U) This study has been conducted to define typical battlefield behaviors for five groups of hostiles and neutrals who might be encountered in combat: (1) Standard Elite Troops, (2) Average Irregulars, (3) Isolated Criminals, (4) Frightened Civilians, and (5) Unfriendly Civilians. Results can be used in modeling computer-controlled hostiles and neutrals (CCH/NS) in the Joint Marine Corps-Navy Team Tactical Engagement Simulator (TTES), a deployable, flexible virtual reality training system. Military personnel and civilian law enforcement officers will use TTES under a wide variety of simulated urban and rural situations to enhance marksmanship skills and to learn to discriminate among possible adversaries, to determine intent and level of hostility, and to decide whether to engage or to withhold fire.

DESCRIPTORS: *COMPUTERIZED SIMULATION, *HUMAN FACTORS ENGINEERING, *BEHAVIOR, FREQUENCY, SIMULATION, MILITARY PERSONNEL, WARFARE, DECISION MAKING, TRAINING, BATTLEFIELDS, JOINT MILITARY ACTIVITIES, TACTICAL ANALYSIS, ENEMY, NAVAL TRAINING, MARINE CORPS TRAINING, URBAN AREAS, RURAL AREAS, CRIMINOLOGY, MARKSMANSHIP, LAW ENFORCEMENT OFFICERS.

AD-A299367

ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS

The Potential for Internal Warfare in the United States.

DESCRIPTIVE NOTE: Master's thesis 2 Aug 94-2 Jun 95

2 JUN 1995 118 PAGES

PERSONAL AUTHORS: Curtner, Daniel D.

UNCLASSIFIED REPORT

ABSTRACT: (U) Drawing upon the writings of social theorists, expositions on American society, public law, and military doctrine, this study examines the potential for internal warfare in the United States. It also addresses the potential for domestic conflict and limited forms of insurgency. The role of active military forces in countering these potential threats to internal security is discussed as well as the adequacy of public law and military doctrine. Social, political, economic, historical, and environmental characteristics of a nation serve as agents of cohesion or of conflict. The United States is increasingly divided over the social issues of race/ethnicity, religion, and crime. These three issues are exploited by some of the hostile groups which exist in the nation. These groups present a potentially violent threat to social order. Government assets and public law are adequate to deal with anticipated domestic threats. Military doctrine, however, lacks the connection between military operations in urban terrain and domestic civil disturbance. The potential nature of modern American social conflict is more organized and violent than that which our military doctrine addresses.

DESCRIPTORS: *MILITARY DOCTRINE, MILITARY FORCES (UNITED STATES), MILITARY OPERATIONS, WARFARE, UNITED STATES, ENVIRONMENTS, THREATS, SECURITY, TERRAIN, INTERNAL, RACE (ANTHROPOLOGY), ETHNIC GROUPS, CONFLICT, DOMESTIC, RELIGION, URBAN AREAS, FEDERAL LAW, COHESION, MILITARY LAW, CIVIL DISTURBANCES, INSURGENCY.

AD-A298118

NAVAL WAR COLL NEWPORT RI JOINT MILITARY OPERATIONS DEPT

Islamic Fundamentalism. Considerations for the Operational Commander.

DESCRIPTIVE NOTE: Final rept.

16 MAY 1995 25 PAGES

PERSONAL AUTHORS: Rosbolt, P. K.

UNCLASSIFIED REPORT

ABSTRACT: (U) With the removal of Cold War restraints, the world is entering insurgency and revolution. Current U.S. counterinsurgency doctrine is codified in Joint Pub 3-07, Doctrine for Joint Operations in Low Intensity Conflict. This doctrine grew out of lessons learned in Vietnam, where the communist opposition generally followed a Maoist pattern of revolution. Many of the new insurgencies, however, may be "Islamic Fundamentalist" in character. Based on examination of the Iranian revolution and the ongoing Algerian uprising, it appears that Islamic insurgencies represent a significant threat to U.S. security and are substantially different in nature from the Maoist model. The key to a successful Islamic revolution is the ability of the radical clergy to first harness a mass revolt of the urban lower class, and then gain the support of the secular opposition. This may occur very quickly, as the existing religious infrastructure becomes the revolutionary organization. Patterns of operation may include use of religious symbolism as cover for revolutionary activities and use of suicide/ high risk attacks on regime and western targets. The CINC may exploit these differences by attacking the cohesiveness of anti-government forces and minimizing cultural antagonism. Additionally, he must be prepared to conduct Noncombatant Evacuation Operations (NEO) on short notice, and institute effective anti-terrorism measures.

DESCRIPTORS: *ISLAM, *COUNTERINSURGENCY, *INSURGENCY, LESSONS LEARNED, MILITARY DOCTRINE, TARGETS, COLD WAR, IRAN TERRORISM.

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