

Marine Corps Warfighting Laboratory

DRAFT

**Millennium Dragon 2002 (MC 02)
Urban Combined Arms Experiment
(UCAX)**



To improve Naval expeditionary warfighting capabilities across the spectrum of conflict for current and future operating forces.

Battalion Level Experiments

After Action Report

June and August 2002



UNITED STATES MARINE CORPS
MARINE CORPS WARFIGHTING LABORATORY
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5096

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From Commanding General

Subj: MILLENNIUM DRAGON 02 BATTALION LEVEL URBAN COMBINED ARMS
EXPERIMENT (UCAX) AFTER ACTION REPORT.

1. This report gathers, organizes and synthesizes knowledge from the live, force-on-force Urban Combined Arms Experiment (UCAX) experiments conducted by the Marine Corps Warfighting Laboratory (MCWL) as part of *Millennium Dragon 2002*.
2. The *Project Metropolis (ProMet)* staff of MCWL conducted necessary pre-experiment training and live experimentation against a dedicated opposition force from 12 to 28 June and 5 through 12 August respectively. All events were done in the closed housing area of SCLA, formerly George Air Force Base, Victorville, California.
3. UCAX training and experimentation focused on tactics, techniques and procedures (TTPs) used by the Marine Air Ground Task Force (MAGTF) in Military Operations on Urbanized Terrain (MOUT) across the spectrum of the *Three Block War* as defined by the 31st Commandant. The experiment force was 3rd Battalion (Rein), Seventh Marines, 1st Marine Division. The Opposition force was 2d Battalion, 23rd Marines, 4th Marine Division.
4. The key area of interest was the transition to *Block II* peacekeeping and peace enforcement operations from *Block III*, highly lethal urban combat. Our results are positive. They provide significant knowledge on effective ways to accomplish combined arms missions in MOUT.
5. We will continue to search for better ways to fight and win more effectively and efficiently across the spectrum of conflict for current and future operating forces.

F. Panter

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EXECUTIVE SUMMARY

1. **Overview.** The Marine Corps Warfighting Laboratory (MCWL), under the aegis of Project Metropolis (ProMet), conducted high and low intensity urban training in the *Military Operations on Urbanized Terrain* (MOUT) facility in Camp Pendleton, CA, and live, force-on-force experimentation against a dedicated opposition force (OPFOR) at Southern California Logistics Airport (SCLA) in Victorville CA during the period of 12 to 28 June and 5 through 12 August 2002, respectively. The primary focus of this was the further development of security operations tactics, techniques, and procedures (TTPs).
2. **Hypothesis.** The basic hypothesis for the experiment was:
That properly trained MAGTFs conducting military operations on urbanized terrain can transition seamlessly and effectively between peacekeeping operations and urban combat high intensity combat without suffering unnecessary friendly casualties and minimizing noncombatant casualties and collateral damage .
3. **The Three-Block War.** Project Metropolis experiments test, validate and refine existing doctrine, technologies and TTPs within the framework of the notional *Three Block War* as described by the 31st Commandant:
"In one moment in time in the same urban area, our Marines are feeding and clothing displaced refugees— providing humanitarian assistance. In the next moment, they are holding two warring tribes apart—conducting peacekeeping operations. In yet another part of the city, they are fighting a highly lethal battle against a determined foe. All on the same day, all within three city blocks. This is what we call the three block war."
General Charles C. Krulak, USMC
31st Commandant of the Marine Corps
4. **Background.** This experiment builds upon the TTPs developed during previous *Block III* (lethal battle) MOUT experiments by adding specific *Block II* (peacekeeping and peace enforcement) TTPs. Our focus was TTPs employed by a Marine Air-Ground Task Force (MAGTF) built around the reinforced battalion. As shown in Annex A to this Report, the force list included elements normally found in a Marine Expeditionary Unit (MEU).
5. **Venue.** ProMet staff conducted all pre-experiment training and actual experiment events in a portion of the closed housing area of the former George Air Force Base in Victorville, CA. This facility is now known as Southern California Logistics Airport (SCLA). The Marine Corps leased an area that includes 320 single- and two-story buildings with four apartments per building. On the second day of experimentation, we added 50 more single story, four apartment structures when the force shifted from Block III lethal battle to Block II peacekeeping operations.
6. **Experiment Participants.**
 - a. **Friendly Ground Forces (BLUFOR).**
 - (1) 3rd Battalion, 7th Marines (3/7) augmented by other ground, air, and combat service support elements from I MEF.
 - b. **BLUFOR Aviation Forces.**

- (1) Five (5) CH-46E, four (4) AH-1W, and two (2) UH-1N from MAG-39.
 - c. **Opposition Forces (OPFOR)**
 - (1) Company G, 2nd Battalion, 23rd Marines (G/2/23), 4th Marine Division.
 - d. **Noncombatant Role Players.**
 - (1) Local civilians (100-120) contracted to play designated roles as noncombatants.
 - e. **OPFOR Antiaircraft Defense Simulators.**
 - (1) Live simulations of truck-mounted radar controlled ZSU-23 gun system.
 - (2) Live simulation of a Man Portable Air Defense System (MANPADS).
 - (a) The Multi-Air Defensive Simulator System (MADSS) that uses a smoke pellet to replicate the launch and flight of a surface-to-air missile from the MANPADS.
7. **Pre-Experiment Training.** The ProMet team trained the BLUFOR at SCLA during June (12-30 Jun) using a tailored / abbreviated version of the Basic Urban Skills Training (BUST) package that featured still-evolving peacekeeping/security operations lessons. The training culminated in a practical application/final exercise.
- a. Between completion of training and returning to SCLA for UCAX in August, 3/7 replaced/joined many new personnel, including two company commanders and eight platoon commanders.
 - b. These new and non-BUST-trained Marines had an effect on the operational effectiveness of their elements and the overall integrity of the experiment.
8. **Experiment Events.** Participants completed a series of discrete experiment situations designed and conducted to meet the specific goals of the experiment. Each event included a specifically designed master scenario event list (MSEL) that ensured consistency from event to event.

Results

1. **Overall Value of BUST.** Leaders without BUST (+) experienced significantly more difficulties operating in the complex urban environment than their peers.
 - a. These included challenges in orienting within the urban terrain, inability to gain and maintain situational awareness, slower and less effective tactical decision-making, difficulty in maintaining communication, and difficulty in assessing the friendly and enemy situation.
 - b. All of these factors served to exacerbate the gaps in the junior leadership noted above, decrease tempo, and curtail aggressive searching for and attacking the enemy.
2. **Additions to BUST Content.** Participants indicated that the lethal battle TTPs taught in BUST are adequate. ProMet will continue to evaluate and monitor these. However we need additional development—linked to experimentation—in areas as follows:
 - a. Air Combat Element operations.
 - b. Reconnaissance, Surveillance and Target Acquisition (RSTA) Operations.
 - c. Casualty handling and evacuation.
 - d. Fire support planning and execution.
 - e. Small Unit Leadership Training; practical application.
 - f. Develop an urban context to staff planning and existing doctrinal terminology.

- g. Formalize the program and create a Combined Arms Urban Warfare Training Center similar in concept to the MWTC.
- h. More practical application on satellite patrol techniques.
- i. Consider MOUT strength training and martial arts practical application.

3. **Command Element Warfighting Objectives**

- a. Battalion staff was severely strained by continuous operations and the requirement to support separate company firm base positions during the security operations phase of the experiment—particularly focused on F/Os, FACs, and intelligence personnel.
 - (1) Difficult to run the battalion staffs while manning the perimeter.
 - (2) Need more rifles as many of the H&S personnel tasked to man the perimeter security positions are armed with pistols.
 - (3) Establishing a separate battalion QRF position exacerbated this situation.
- b. Current doctrinal terms lose their clarity in operations in the urban battle space. For example: “Clear” and “Secure.”
- c. Traditional fire support coordination measures that work well in open terrain are ill suited for the complex terrain of the urban battle space.
 - (1) If possible, it may be advisable to rotate forces after an intense fight rather than having the unit transition to peacekeeping operations.

4. **Making the Shift Between Lethal Battle and Peacekeeping.** Individuals and units continue to have difficulty in shifting from higher intensity to lower intensity operations. The escalation from peacekeeping to battle tended to be easier. We saw that a unit other than the one that experienced heavy fighting and casualties was less on edge and better suited to “win hearts and minds.”

5. **Escalation of Force TTPs.** TTPs seemed to be adequate for the situations presented. These TTPs are closely linked to the rules of engagements (ROE).

6. **Satellite Patrolling.** Comments from BLUFOR and particularly the OPFOR confirm that satellite patrolling is a viable concept. For example, OPFOR stated that they had problems dealing with the dispersed, unpredictable and seemingly random movement of the patrol sub-elements. Overall, it made OPFOR operations more risky and difficult. This greatly assisted in taking away some of the *defender's* advantage.

7. **Checkpoint Operations and Personnel / Vehicle Searches.** In general participants remarked that the basic techniques were adequate.

8. **Hasty Building Searches.** TTPs were readily mastered in training and were seen to be adequate to support the experiment.

9. **TTPs for reconnaissance/ scout sniper teams in urban ground reconnaissance (UGR).** Marine Corps reconnaissance forces and/or snipers do not receive any basic level instruction on urban reconnaissance and surveillance (R&S) unless attached to a deploying MEU. In this case they get training from the Special Operations Training Group (SOTG). However, the SOTG pre-deployment training focuses on covert missions. Therefore, these Recon Marines

and snipers are left to their own devices to develop an approach to R&S in support of GCE in the urban environment. Also, if a Recon Marine or sniper has never been to the SOTG urban R&S course or the urban Sniper course, he has no knowledge of his *role* in this environment. Feedback from experiment participants recommended pre-employment MOUT training to include asset management, insertion methods and coordination, link up procedures and control of fire support in the urban battlespace.

10. **Medical Support and CASEVAC.** Our data indicates serious shortfalls in the ability to treat, transport, and track casualties. By the end of the attack, the battalion aid station was overwhelmed, out of bandages and many important medicines; and—because of the absence of helicopter landing zones and ground vehicles not committed to the fight—there was no practical way to CASEVAC the wounded. This is a recurring finding.
11. **Combat Support Teams (CSTs).** All of our experimentation shows that the CSTs formed to support forward units are effective in MOUT. An important enabler for the CSTs was the small, agile, low silhouette vehicle they use to move supplies forward and casualties to the rear. We used John Deere Gators as a surrogate for this capability.
12. **Rotary Wing Close Air Support.** We used these two (2) experimental approaches to speed up the CAS process.
 - a. Company Fire Support Team (FiST) Members as Universal Spotters.
 - (1) Good concept, but Not enough data.
 - b. Six Line (6-Line) CAS Brief. Proved to be very effective and was lauded by both pilots and FO/FACs.
13. **Target Identification.** Because of the close quarter, noncontiguous nature of the urban battlespace, verifying the location of friendly forces is a challenge. It was no different in this experiment because our experiments always presented *danger close* CAS missions against an OPFOR that was usually within 100 meters of the requesting unit. And, sometimes only one building, or one floor of a building separated friendly and enemy forces. Here is what we saw:
 - a. The aircrew almost always had to be at close range (c. 500 meters) for this visual ID.
 - b. Aircrew could not always begin shooting on the “cleared hot” call because they had to make the positive ID.
 - c. When OPFOR were out in the open—but not in a close battle with friendlies—aircrew successfully engaged those targets (with the above noted restriction).
 - d. When OPFOR was inside buildings, positive ID was not possible without a target mark or a FAC with the ability to clearly and concisely talk the pilot’s “eyes-on” the target.
14. **Effectiveness of Rotary Wing Current Tactics.** Our videotapes showed us that properly flown existing tactics limited the potential for successful engagements by MANPADS and radar controlled guns.
15. **Communications: AN/PRC-148 and the Personal Role Radio.** This combination proved very effective across the board—both as an enhancement to situational awareness and a replacement for the obsolescent intra squad radio (ISR).

EXPERIMENT OVERVIEW

This Urban Combined Arms Experiment (UCAX) experiment conducted by the Project Metropolis (ProMet) Section of the Marine Corps Warfighting Laboratory (MCWL) had two phases. The first phase was the fifteen-day pre-experiment training conducted from 12-30 June 2002 in a portion of the closed housing at Southern California Logistics Airport (SCLA), formerly: George Air Force Base. The second phase was the execution of experiment events from 7-11 August 2002 as part of *Millennium Dragon 02*. Each of these phases was designed to respond to discrete objectives in support of the overall experiment hypothesis that spanned the notional *three-block war* (see below). We were to evaluate the value of this type of UCAX to establish a training template—activities and resources—for a valid method to prepare a reinforced battalion combined arms team to conduct operations across the spectrum of MOUT.

Experiment Hypothesis. The basic hypothesis for the experiment was:

That properly trained MAGTFs conducting military operations on urbanized terrain can transition seamlessly and effectively between peacekeeping operations and urban combat without suffering unnecessary friendly casualties and minimizing noncombatant casualties and collateral damage.

Definition of the Three-Block War. This ProMet experiment aimed to test, validate and refine existing and emerging doctrine, technologies and TTPs within the framework of the notional *Three Block War* described by the 31st Commandant and illustrated in figure 1.

"In one moment in time in the same urban area, our Marines are feeding and clothing displaced refugees—providing humanitarian assistance. In the next moment, they are holding two warring tribes apart—conducting peacekeeping operations. In yet another part of the city, they are fighting a highly lethal battle against a determined foe. All on the same day, all within three city blocks. This is what we call the three block war."

General Charles C. Krulak, USMC
31st Commandant of the Marine Corps



Figure 1 Three-Block War

Participant Force List

Ground Combat Element (GCE)

- 3d Battalion 7th Marines LtCol Belcher.
 - Arty Liaison Section, I Battery, 3d Battalion, 11th Marines.
 - 1st Platoon, Company B, 1st LAR Battalion.
 - 2nd Platoon, Company D, 3rd AA Battalion.
 - 3rd Platoon, Company C, 1st Tank. Battalion.
 - 3rd Platoon (+), Company C, 1st Combat. Engineer. Battalion.
 - 2nd Platoon, Company A, 1st Reconnaissance Battalion.
 - Detachment, Military Police Company, 1st Marine Division.

Combat Service Support Element (CSSE)

- CSSE - Detachment, 1st Force Service Support Group (OPCON to 3/7).
 - Detachment, Transportation Support Battalion 1st FSSG.
 - Detachment, 7th Engineer Support Battalion.
 - Detachment, Supply Battalion.
 - Detachment, Maintenance Battalion.

Aviation Combat Element (ACE)

- HMM-268 (-). (DS to 3/7). LtCol Driscoll.
 - Five (5) CH-46E
 - Detachment, HMLA 267.
 - Four (4) AH-1W
 - Two (2) UH-1N
-

Pre-Experiment Training

Training Objectives

1. Evaluate the most effective *content* of individual and collective training packages to prepare individuals, teams, and units for combined arms offensive and defensive MOUT.
2. Evaluate the most effective instructional *methods* to prepare individuals, teams, and units for combined arms offensive and defensive MOUT.
3. Establish the initial training requirements—time and resources—needed for a platoon, company, and battalion combined arms team to develop *proficiency* in MOUT.
4. Establish the sustainment training requirements—time, frequency and resources—for a platoon, company, and battalion combined arms team to maintain its proficiency to effectively conduct combined arms MOUT.
5. Determine the type and number of facilities required to properly conduct individual and collective MOUT training.

Training Execution. The ProMet team, augmented by certified MOUT instructors from I and II Marine Expeditionary Forces (MEFs), trained the BLUFOR using a tailored version of the Basic Urban Skills Training (BUST) syllabus. Training was conducted from 12 –30 June. This training, developed from five years of MCWL experimentation and participant feedback was essential in order to:

- Provide the TTPs intended for evaluation.
- Ensure the experiment forces have a consistent baseline of urban warfighting capability.
- Further evaluate and develop the BUST package.

The training culminated in a practical application/final exercise.

Note:

1. See Annex A for Summary of 3/7's evaluation of the training.
2. See Annex for the tailored BUST schedule

Turnover of Trained Personnel. Between completion of training at the end of June and returning to SCLA for UCAX in August, 3/7 replaced or joined many new personnel. This included two (2) company commanders and eight (8) platoon commanders. These new and non-BUST-trained Marines had an effect on the operational effectiveness of their elements and the overall integrity of the experiment.

MAGTF Warfighting Experiment

Note: These experiment objectives support the all of the elements of the combined arms MAGTF. They are broken out into separate elements in this AAR for easier identification.

Warfighting Objectives – MAGTF Command Element (CE).

1. Determine what command and control TTPs need to be further developed to enable mission accomplishment of units operating across the range of *Block II* peacekeeping through *Block III* lethal battle in MOUT.
2. Examine the adequacy of existing doctrine and TTPs for selecting, occupying, and operating out of urban patrol bases.

Warfighting Objectives – Ground Combat Element (GCE).

1. Examine the degree to which the urban combined arms combat formations developed for platoons, companies, and battalion enable seamless, effective transition from *Block II* peacekeeping operations to *Block III* lethal battle operations for a reinforced battalion.
2. Establish and evaluate procedures for deploying a reaction force.
3. Assess the adequacy of the escalation of force TTPs.
4. Evaluate the satellite patrol concept across the range of MOUT from *Block II* peacekeeping through *Block III* lethal battle.
5. Assess the adequacy of the TTPs for
 - a. Vehicle and personnel searches and check point operations.
 - b. Hasty building searches.
 - c. Casualty evacuation.
 - d. Tactical resupply operations.
6. Evaluate employment procedures and techniques used for reconnaissance and scout sniper teams in urban ground reconnaissance (UGR).

Warfighting Objectives – Combat Service Support Element (CSSE).

1. Assess the adequacy of TTPs for medical support and casualty evacuation (CASEVAC).
2. Assess the adequacy of TTPs for tactical resupply.

Warfighting Objectives – Aviation Combat Element (ACE)

1. Evaluate employment procedures and techniques for Rotary Wing (RW) CAS as they specifically relate to:
 - a. Response time.
 - b. Target identification
 - c. Position marking.
 - d. Existing tactics.
 - e. Aircrew survivability.
 - f. Use of the 6-line brief.
 - g. Positive control.
 - h. Suppression of enemy defenses.
2. Evaluate employment procedures and techniques for Assault Support as they specifically relate to
 - a. Target identification
 - b. Position marking.
 - c. Existing tactics.
3. Evaluate the Universal Spotter concept.
4. Evaluate the value of the non-T/E radios.

Experiment Organization. To optimize our opportunities to collect useful information and to maintain congruence with experiment objectives, we used three key groups: Exercise Control (EXCON), Observer Controllers (O/Cs) and Noncombatant role players (contract civilians).

- *Exercise Control (EXCON)*, comprised of MCWL/ProMet staff members:
 - Established the initial flow of each event.

- Maintained ground truth to the maximum extent possible and interjected appropriate events from the MSEL to set the conditions to align with experiment objectives.
- Controlled general OPFOR activities.
- *Observer Controllers (O/Cs)*:
 - Monitored free-play, made on scene adjudications where necessary and collected data.
 - Debriefed participants at the end of every event.
- *Noncombatant Role Players* were introduced into each scenario to:
 - Challenge the ability of the participants to discriminate enemy from noncombatants.

Data Collection. We collected force-on-force information through direct observation by O/Cs, download of MILES data, and end-of-event questionnaires filled out at the individual, fire team, squad, and platoon levels. Casualty information was developed from downloaded MILES data, and on-site “calls” by O/Cs. The O/Cs also collected information generated by interaction with noncombatant role players.

Source of Observer Controllers (O/Cs) ProMet has historically invited subject matter experts (SMEs) as O/Cs. They have been a significant resource in assisting in developing and evaluating our concepts and assisting in drafting our *findings*. O/Cs were briefed on experiment goals, weapons effects adjudication, data collection procedures, data collection forms, and given an orientation to the BUST TTPs. These personnel were assigned duties consistent with their rank and MOS. We needed a large number of O/Cs to cover 24-hour continuous operations. O/Cs were sourced from:

- MCWL
- The Basic School
- Command and Control Systems School
- Marine Forces Atlantic HQ
- II MEF Special Operation Training Group (SOTG)
- Marine Corps Base Camp Lejeune
- 2d Marine Division
- I MEF
- 1st Marine Division Schools
- MP Company, 1st Marine Division
- Marine Aviation and Tactics Squadron (MAWTS)
- School of Infantry (SOI) West
- US Army
- US Air Force
- White Sands Missile Range
- Center for Naval Analysis
- United Kingdom
- Canada
- Australia
- Israel
- Sweden
- Belgium
- France
- Denmark.

O/C Organization. To meet the challenges presented by the continuous nature of the experiment over the 96 hours, O/Cs were formed into teams as follows:

- EXCON
- Battalion Command Group
- Company, Platoon and Squad
- Mechanized/Armor (mech/armor)
- Combat Service Support (CSS)
- Medical.
- Aviation
- OPFOR/role players.

The O/C Team Leader managed his group to meet the experiment schedule. This included a daily key personnel briefing, the tactical debriefs and end of event data collection effort.

O/C Responsibilities.

- Track the unit through mission work-up; attend mission briefs and rehearsals.
- Move with the unit; observe, record activities, and adjudicate engagements as required.
- Maintain an activity log to record their element's actions.
- Participate in end-of-event reconstruction.
- Guide detailed debriefs.
- Ensure participants fill out event questionnaires and turn in casualty forms.
- Provided feedback based on their observations and knowledge of experiments objectives.
- Collect, collate and turn in completed data package upon completion of each watch.

Outline of Experiment Events.

- Experimentation began on 8 August and ended on 12 August 2002.
- Scenario was a mythical country where two competing paramilitary type elements using a combination of asymmetric and terrorist tactics, intermixed with noncombatants who opposed one another.
- Experiment events were force-on-force structured free-play format.
- Experiment scenarios were provided to the task force commander as warning orders to enable basic mission planning as early as practical.
 - For a 96-hour period, including rehearsal and operations.
- EXCON inserted some scripted events drawn from the master scenario event list (MSEL) to shape appropriate tactical activities
- After action review (AAR) conference was conducted on 13 August.

Experiment Execution.

Rehearsal Day.

- 8 August.
 - A full dress rehearsal for all forces and supporting personnel.
 - Operations included a mechanized / armor attack with two companies to seize a landing zone to enable the third company to land and continue the attack to expel the OPFOR from the AO.
 - Debrief of rehearsal.
 - Subsequent to debrief
 - OPFOR and role players established the city (*playbox*).
 - RSTA assets inserted into the *playbox* that evening.

<p>This is the only day that participants used Special Effects Small Arms Marking System (SESAMS)—formerly: <i>simunitions</i>—to generate actual visible body hits. They also used MILES, blanks and subjective on-site “calls” by O/Cs.</p>

Experiment Days.

Force-on-force events on 9 and 10 August used a combination of blanks, MILES 2000, and subjective calls by O/Cs. The decision to not use SESAMS during the main experiment was predicated on the need to eliminate the facemask to enable better recognition and communication among participants during the peacekeeping scenarios.

- 9 August.
 - BLUFOR attacked with two mech/armor company teams on line to seize a landing zone for the third company to land and continue the attack to expel OPFOR from the AO.

- 10 August.
 - At approximately 0930, the scenario shifted from Block III (lethal battle) operations to peacekeeping (Block II) operations.
 - Companies moved from their night positions and established individual firm bases.
 - Battalion headquarters and logistics train established a separate compound not too far from the battalion quick reaction force position.
 - BLUFOR occupied these positions until ENDEX at approximately 0800 on the 12th.

RESULTS – PRE-EXPERIMENT TRAINING

This section includes knowledge about pre-experiment training that we have gathered organized and synthesized from questionnaires, interviews, debriefs, direct observation, and after action reports from the various individuals, elements, and units involved.

Basis of the Pre-Experiment Training Objectives. This experiment moved from the reinforced company level to a reinforced battalion (mini-MEU) combined arms team. The goal was to continue development of the *Block III* lethal battle and *Block II* peacekeeping operations TTPs and supporting training requirements. The objective is to develop a single inclusive BUST package for use in training all MAGTF individuals, teams, and units. Here is a summary of findings and observations related to the training conducted from 12-30 June 2002 at SCLA. They are specifically matched to the Training Objectives stated earlier in this report. Annex A contains a summary of comments on the training from the 3/7 BUST AAR.

Training Objective #1. Evaluate the most effective content of individual and collective training packages to effectively prepare individuals, teams, and units for combined arms offensive and defensive MOUT.

Overall Value of BUST.

1. The 3/7 AAR for UCAX provides the following assessment:
 - a. *Leaders without BUST (+) experienced significantly more difficulties operating in the complex urban environment than their peers.*
 - b. *These included challenges in orienting within the urban terrain, inability to gain and maintain situational awareness, slower and less effective tactical decision-making, difficulty in maintaining communication, and difficulty in assessing the friendly and enemy situation.*
 - c. *All of these factors served to exacerbate the gaps in the junior leadership noted above, decrease tempo, and curtail aggressive searching for and attacking the enemy.”*

Additions to Block III TTPs. Participants indicated that the lethal battle TTPs taught in BUST are adequate. ProMet will continue to evaluate and monitor these. However, as noted below, we note a need for some additional development—linked to experimentation—in areas outlined below.

2. Additional TTPs needed for:
 - a. Air Combat Element operations; specifically,
 - (1) Close Air Support (CAS), and
 - (2) Assault support.
 - b. Reconnaissance, Surveillance and Target Acquisition (RSTA) Operations.
 - c. Casualty handling and evacuation.
 - d. Fire support planning and execution.
3. Participant suggestions for expanding the BUST package:
 - a. Include howitzer sections.
 - b. Incorporate a separate mortar employment course for mortar units.
 - c. Include CSS and other attachments in *all* BUST programs.
 - d. Add a two (2) to three (3) day supporting arms live-fire exercise at Yuma/Yodaville.
 - e. Add tank/mech infantry practical application time – to include more night operations.
 - f. Add organic weapons live fire package, to include grenades, explosives.

- g. Include in-depth instruction on all three functions of electronic warfare in civilian infrastructure.

Additions to Block II TTPs.

1. Develop and refine training for:
 - a. Media handling.
 - b. Improvised explosive devices (IEDs)
 - c. Booby traps.
 - d. Battalion/company level firm base operations.
 - e. Quick Reaction Force (QRF) employment.
 - f. Resupply and convoy operations.
 - g. Employing armor and mechanized assets in peacekeeping operations.
2. Add an additional day of squad and platoon peacekeeping practical application to allow for unit SOP development.

Adjustments to Small Unit Leadership Training.

1. Schedule the classes so that leaders do not miss other instruction.
 - a. **Note:** The full BUST package includes an embedded separate instruction segment for small unit leaders. Due to time constraints, some classes during the tailored BUST ran concurrent with other BUST classes. That is, they were not given to everybody.
2. Develop a platoon commander's tactical decision game (TDG).
3. Develop instruction and practical application on initiative based tactics for small unit leaders to better develop their skills.
4. Develop an urban context to existing doctrinal terminology.
 - a. **Note:** Throughout ProMet's experiments, it has been noted that there is a problem with understanding what terms should be used in describing the desired end state for urban operations.
 - b. For example, doctrinal terms like "secure" or "clear" a building/buildings is not enough information. Probably need to add a phrase such as "by secure, I mean...."
5. Further develop and refine techniques and procedures for urban IPB.

Adjustments to Battalion Staff Planning in MOUT. ProMet included classes and a wargame oriented on battalion staff planning in the urban environment. Of all the experimental urban training packages, this one is in the greatest level of flux. This was the second time the team had attempted this seminar/ instruction package. Comments relative to this package include:

1. Use the staff training technique used at Mountain Warfare Training Center (MWTC); i.e.:
 - a. Develop the order.
 - b. Brief the order.
 - c. Conduct a SME guided terrain walk.
2. Add discussions on information operations.

Training Objective #2. Evaluate the most effective instructional methods to prepare individuals, teams, and units for combined arms offensive and defensive MOUT.

In most cases, students want more practical application and fewer lectures during the BUST package. No more than two consecutive hours of lecture. Here is a summary of comments:

1. Use more preparatory videotapes to set the stage and motivate participants before training begins.
2. For better return on investment, plan break time into the BUST schedule for rest and recoup, plus time for maintenance.
3. Formalize the program and create a Combined Arms Urban Warfare Training Center similar in concept to the MWTC.
4. Consider increasing the fire team level practical application and then move on to squad and higher practical application level.
 - a. *Note*: The person making this comment noted that the urban area divides squads and platoons into fire team sized elements, therefore more attention should be paid to preparing the fire team leader and his element.
5. Include an urban navigation course at the fire team level.
6. Conduct more tarpaper house drills.
 - a. Include non-combatants and ROE.
7. Put more emphasis on supporting arms; i.e., mortars, artillery, rotary wing CAS.
8. Need more practical application on satellite patrol techniques.
9. Need more night practical application on offense/defense at the platoon and company level.
10. Consider following the martial arts training outline concept—explain, demonstrate, then imitate, then practice (EDIP).
11. Consider increasing unit leaders' roles in the train-the-trainer and let them play their roles in training/practical application.
12. Consider urban environment strength training.
13. Add urban martial arts practical application.
14. Provide a *smart pack* (e.g., pocket checklists, pertinent mini-references, etc.) for patrol/firm base ops in urban area, with a TEWT.

Training Objective #3. Establish the initial training requirements—time and resources—needed for a platoon, company, and battalion combined arms team to develop proficiency in MOUT.

Based on our observations we think it takes five (5) weeks of training to develop proficiency. We respond to the objective in the following three-tiered structure:

1. It takes approximately three (3) weeks of individual and small unit (squad through company) collective training to develop adequate *familiarization* with the Block II peacekeeping and Block III lethal battle urban TTPs.
2. It will take an additional one (1) week of intensive training to develop unit *proficiency* at the company combined arms team level.
3. Once the initial proficiency level is achieved at the reinforced company level, an additional one (1) week is needed to develop a fundamental proficiency level at the reinforced battalion level for Block III lethal battle operations.

<p><i>Note</i>: When the requirement for peacekeeping operations is added, additional training time is needed before MAGTFs will function as cohesive teams.</p>
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Participant AAR Comments.

1. Units require more practical application training to develop needed proficiency in conducting combined arms operations in the urban environment.

2. Modifications to the BUST will be required to more thoroughly train units on those skills that were clearly more difficult to master (tank/infantry integration, satellite patrolling, etc.).
3. Marines seem to grasp Block III lethal battle operations easier than Block II peacekeeping operations. Therefore, it takes less training time for units to acquire a moderate level of proficiency in high intensity ops than it will to attain an equal level for Block II peacekeeping operations.

Training Objective #4. Establish the sustainment training requirements—time, frequency and resources—for a platoon, company, and battalion combined arms team to maintain its proficiency to effectively conduct combined arms MOU.

Given operational tempo issues, ProMet did not attempt to measure the effect on proficiency from the 35-day break between BUST and the beginning of experiment operations. Although 3/7 conducted some MOU related sustainment training at 29 Palms during the break, this training was not only oriented toward maintaining skill level, but also at training newly joined personnel who had not attended BUST at SCLA. See the remark in the findings to Objective #1 relative to the effect of personnel turnover.

Training Objective #5. Determine the type and number of facilities required to properly conduct individual and collective MOU training.

Although a comprehensive response to this objective cannot be empirically determined by this experiment, we were able to gain some insight as shown in the following combination of ProMet opinion and participant feedback specifically related to using the SCLA facilities. From this, we can deduce many of the things that are important to support meaningful and effective training.

1. SCLA is the best urban training site available to U.S. forces. Its size, layout and complexity give us the ability to conduct combined arms team training. There are adequate building designs and space to train for almost every needed skill set in the BUST package. There are few restrictions in employing mechanized vehicles. Its size enables the training team to run concurrent lanes in such numbers that allows an effective balance between the number of required instructors, time available, and class size. During BUST, ProMet trained approximately 900 Marines and Sailors of the MAGTF in sixteen training days using four separate BUST sites supported by thirty (30) primary instructors and 90+ assistant instructors from the various units.
2. Though small, SCLA presents a real challenge to differentiate friendly from enemy locations.
 - a. *This was often a showstopper for CAS during the experiment.*
3. Because SCLA is not a government operated training site, MCWL had to procure hygiene and sanitation items (Porto-Potties, and potable water). And, to enhance training realism, acquired or produced items such as signs, furniture, household items, market items, lighting, role player costumes, vehicles/buses, etc.
4. Here are the current limitations to SCLA and how we dealt with them to support the training.
 - a. No lighting.
 - (1) To give us a scenario set in a semi-functioning city, MCWL used generators to light certain areas of the city. We used a combination of stand-alone light units and existing building wiring connected to generators for power. Engineers checked the wiring and then set up the generators. This presented the BLUFOR with different night lighting challenges, as well as enabling role players to conduct more normal nighttime activities.

- b. Absence of indigenous population/noncombatants.
 - (1) MCWL hired civilian personnel to augment the Marines acting as both role players and OPFOR.
 - (2) Hiring civilians has its own set of problems, but it is one way to get the mix of ages, gender, shapes, etc. needed to more realistically replicate possible operational deployment scenarios.
 - (3) Because the civilian role players gave a realistic mix of noncombatant role we learned two important lessons. First, Marines are very hesitant to conduct searches of females and second, Marines are not too sure what to do with older personnel. Both of which are often found hiding in urban areas when forces move in.
- c. Absence of language and ethnic differences.
 - (1) This is hard to replicate, but in some cases, we used Spanish speakers (or other languages) to create situations where role players speak a different languages than the Marines.
- d. Size of Training Area.
 - (1) Although SCLA is the largest MOUT training site available for integrated combined arms training, it is still too small to conduct reinforced battalion sized MAGTF operations.
 - (2) There is inadequate space to assemble formations to enter the playbox prior to enemy engagement.
 - (3) Cannot replicate other urban areas surrounding a unit's TAOR though which they would have to move to get in and out of any objective area. This includes convoy ops, tactical maneuver to surprise the enemy, etc.
 - (4) This makes many support or movement to contact operations seem simpler than they might be if the battalion was operating deep within a city.
 - (5) This limited space causes the BLUFOR to focus inward and eliminates any real adjacent unit boundary issues.
- e. Insufficient certified helicopter landing zones (HLZs). This is a safety issue for training
 - (1) Within the standard playbox, there are insufficient—only five (5)—certified HLZs and no certified rooftops for landing, hover drop-off, or FAST rope insertions.
 - (2) During free-play force-on-force events, it is a very simple task for the OPFOR to foul or defend the five existing HLZs.
- 5. In scenarios where the battalion was operating multiple company firm bases during peacekeeping operations, ProMet used the additional SW housing area in an attempt to provide a more realistic TOAR size. But vehicle off-road and breakage restrictions limited the learning environment.

Future UCAX Concept. UCAX could be improved to be an excellent method to prepare units for urban combat. Vision of improved UCAX concept is to model it after the existing 29 Palms combined arms exercise (CAX) without the live fire. For example, conduct a MOUT graduation exercise for a deploying battalion that had completed its work-up training (BUST) and developed a level of proficiency. This would entail having a permanent staff to O/C the event and some form of challenging urban FEX that enabled the commander to measure his unit's performance.

The MD-02 UCAX is not the conceptualized UCAX described above. It included parts of the needed program, but also included a good bit of developmental discovery learning. This was

necessary because there are still a lot of urban TTPs that need development. Here is a summary of participant, O/C and ProMet feedback relative to resources required to conduct meaningful UCAX-like events.

Training Area(s).

If urban training becomes a priority, expanded and possibly additional urban training sites will be needed to meet the demands. We recommend:

1. Acquire and control a suitable DoD urban training area.
 - a. SCLA is an exercise area that is marginally large enough and complex enough to properly challenge the unit.
 - b. It is the only good urban training area in CONUS that is currently available.
 - (1) However, SCLA is not a DoD-owned/operated training facility.
 - c. The Marine Corps just recently took over control of a similar sized facility in Guam that is adjacent to Andersen Air Force Base. Composed largely of a closed housing area, barracks and light industrial area, the *Andersen South Training Area (ASTA)* is the largest urban training site owned by DoD.

The concepts and objectives for many of these experiments originated with the USMC Ground Board and/or the Infantry Operations Analysis Group (IOAG).

Training Cadre.

ProMet is the existing Marine Corps MOUT training cadre because we have had to develop and conduct training for participants in MCWL experiments. This is an ad hoc approach that relies heavily on augmentation from outside sources. We recommend a properly organized and equipped, dedicated core staff of SMEs and O/Cs to supervise and mentor the force.

Marine Corps Training Requirement.

1. First and foremost, the Marine Corps should:
 - a. Establish a training requirement and support it with a training system that specifies and controls individual and collective training for all MOSs and MAGTF functions.
 - b. Establish a USMC requirement (with necessary METLs) for units to conduct urban training.

Marine Corps MOUT Training Program of Instruction.

There is no USMC-wide training syllabus for MOUT other than the POI that supports the individual MOUT sites at different bases. The yet-to-be-approved BUST program that underpinned UCAX will eventually address this deficiency. Here is our recommended approach:

1. Establish funding line(s) and TEEP space for a institutional approach to MOUT training.
 - a. TECOM is presently working with the MCWL ProMet team to develop the needed individual training standards (ITS), mission essential task list (METLs), training manuals, etc. to establish training standards/ requirements across the specialties and organizations.
 - b. This is a slow effort that is not well funded.
 - (1) Funding support for ProMet TTP development and experiments comes out of the MCWL budget. When the TTP development is completed and the training program transitions to TECOM, funding support will have to come from other sources.

- Budgeting action is needed to cover future operations once the requirement is established.
- c. Until such a program is established, mandated, prioritized and funded, MOUT training—especially collective training—will be hit and miss.
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RESULTS – WARFIGHTING EXPERIMENT – CE OBJECTIVES

This section includes knowledge about warfighting by the MAGTF Command Element (CE) that we have gathered organized and synthesized from questionnaires, interviews, debriefs, direct observation, and after action reports from the various individuals, elements, and units involved.

Overview. This was the second reinforced battalion sized combined arms team urban experiment that ProMet has conducted at SCLA. It was the third event in the peacekeeping TTP development progression where we moved from company level operations to the battalion. The following selected findings are provided. Also, summary comments from 3/7's UCAX AAR are included as Annex C. Though it is based on their two experiences, the battalion FEX during BUST and UCAX, it is considered an excellent and honest review of the issues and their performance and is worthy of review in total.

Effect of Personnel Turnover on the Experiment. The experiment was significantly affected by the fact that two (2) company commanders and nine (9) platoon commanders joined the battalion between BUST and the beginning of the UCAX experiment. Also, the battalion received its deployment fill personnel. To make up for the loss of training, 3/7 conducted some BUST-type training before returning to SCLA. This provided some sustainment training for those who attended BUST and introductory training for the new joins. It was encouraging to hear a new company commander using BUST terminology during an early rehearsal, which was only possible if he had been studying or receiving unit training.

- The absence of BUST was most apparent during company and below planning. These officers were learning as they went with guidance from those that had attended BUST.
- The experiment design did not incorporate any metric(s) to assess the effect of this factor on experiment results.

CE Warfighting Objective #1. Determine what command and control TTPs need to be further developed to enable mission accomplishment of units operating across the range of Block II peacekeeping through Block III lethal battle in MOUT.

Battalion Command Post Operations.

- Battalion Forward (“Jump”) CP was mounted in an AAV-C7. This worked well.
- CO used HMMWV as additional mobile CP.
 - Needed to establish a security element with an NCOIC to supervise.
- During UCAX, established the main and did not displace until main attack was completed and seized a site capable of supporting the battalion main, BAS and the log train.
 - Included a Forward Resuscitative Surgical Suite (FRSS) in the battalion main.
- Battalion staff was severely strained by continuous operations and the requirement to support separate company firm base positions during the security operations phase of the experiment.
 - Severe staff strain particularly focused on F/Os, FACs, and intelligence personnel.
- The battalion expressed some frustration in trying to apply current doctrinal terms and symbols to operations in the urban battle space.
 - For example: “Clear” and “Secure”

Fire Support Coordination Measures.

Our results confirm once again that traditional fire support coordination measures that work well in open terrain are ill suited for the complex terrain of the urban battle space. The major challenges in this regard are:

- It is largely a direct fires fight; indirect fire weapons play a smaller role.
- Mortars may be the best and most responsive weapon system for missions.
- ROE restrictions and accuracy (range probable error and effective casualty radius) will preclude many missions by fixed wing and artillery.
- Responsiveness will require streamlined procedures.
- Inability of fire support teams (FiSTs) to gain line of sight to targets.
 - Controllers will not observe most missions.
- “Danger close” nature of most fire missions.
- Restrictions that come with ROE.
- Dead space created by buildings masking targets from artillery.
- Restrictions to CAS.
 - The battalion had success with some creative procedures.
 - Discussed in detail in the ACE results later in this report.
- Fleeting nature of targets.
- Marking friend and foe critical is in close terrain, particularly difficult for CAS

Force Requirements.

- If possible, it may be advisable to rotate forces after an intense fight rather than having the unit transition to peacekeeping operations.
- Battalions will need to task organize FiST differently to cover the decentralized small unit nature of the fight.
- Battalions will require additional personnel augmentation when assigned independent urban operations.
 - These may include civil military affairs, PAO, translators, counter intelligence, etc.

Employment of Military Police.

During the attack phase, 3/7 used their MP detachment in a number of ways, including as guides for the Army forces that joined the initial assault while in progress and to assist in linkup operations. During the peacekeeping phase, they were used to handle EPWs and assist in conducting vehicle checkpoints.

CE Warfighting Objective #2. Examine the adequacy of existing doctrine and TTPs for selecting, occupying, and operating out of urban patrol bases.

The 3/7 BUST end-of-course FEX was the first time that ProMet had an opportunity to conduct a multi-company firm base battalion level peacekeeping operation. Therefore, the TTPs for firm base operations were not fully developed. Additional lessons were discovered that will be included in future events.

- The standard playbox was too small to fully train and experiment with the force during UCAX.
- Post event feedback comments confirmed that the battalion did not have the necessary personnel to properly man three company firm bases and the battalion CP.

- This was particularly true for extended 24-hour operations.
- Firm base operations personnel shortages were particularly noticeable for engineer, EOD, intelligence analysts / briefers / debriefers, fire coordinators, interpreters, and civil affairs.
- Difficult to run the battalion staffs while manning the perimeter.
- Need for rifles as many of the H&S personnel tasked to man the perimeter security positions are armed with pistols.
 - Establishing a separate battalion QRF position exacerbated this situation.

The shift from a *warfighting* CP to a *peacekeeping* CP brought some additional requirements for the battalion. For example, the battalion needed a secure area for meetings with media, non-government officials, local leadership, and other non-Marine personnel. This recurring requirement further strained the battalion leadership and security assets. The duty for most of these meetings fell to the battalion XO.

Participant feedback comments recommended that ProMet develop *smart packs* and checklists for firm base operations. Design the checklists on the tactical exercise without troops (TEWT) conducted for company officers led by Maj Sullivan, ProMet OIC that was based on his experience in similar circumstances in Kosovo. TEWT was very effective, and participants recommended we formalize it into class and include all the unit leaders.

RESULTS – WARFIGHTING EXPERIMENT – GCE OBJECTIVES

GCE Warfighting Objective #1. Examine the degree to which the urban combined arms combat formations developed for platoons, companies, and battalion enable seamless, effective transition from *Block II* peacekeeping operations to *Block III* lethal battle operations for a reinforced battalion.

Making the Shift Between Lethal Battle and Peacekeeping. Individuals and units continue to have difficulty in shifting from higher intensity to lower intensity operations. The escalation from peacekeeping to battle tended to be easier. The senior leaders and SMEs generally agreed that the quick fix to difficult transition from combat to peacekeeping is to replace units as soon as practicable as shift is made. Although we encountered some problems with this approach, we saw that a unit other than the one that experienced heavy fighting and casualties was less on edge and better suited to “win hearts and minds.” Nevertheless, there were a few instances of inappropriate behavior by Marines.

- If it is not possible to replace the initial attacking unit once the action shifts from battle to peacekeeping, the chaplain suggested bringing in contact teams to counsel the survivors to lessen any residual anger and improve the *hearts and minds* aspect.
- The intent here is to ensure the Marines and Sailors understand the change in situation and reduce stress-induced inappropriate actions.
 - It was further noted that memorial services could assist in dealing with grief.

There seemed to be less difficulty in shifting from peacekeeping to combat. Although we saw some hesitation by Marines to escalate their combat level after they have become *comfortable* during peacekeeping situations. They tended to look for direction or approval from a senior instead of acting on their own—even when the action was clearly within the ROE. This is consistent with observations from previous experiments.

GCE Warfighting Objective #2. Evaluate the effectiveness of TTPs used to employ the reaction force.

Terrain restrictions in SCLA made deployment of reaction forces somewhat predictable. Also, the battalion reaction force remained in the same location during UCAX. Because of this, the OPFOR planned to ambush the standing battalion reaction force. However, the battalion reaction force was not deployed during the experiment. Therefore, we did not evaluate the battalion level TTPs. However, the company-level reaction forces were employed on a number of occasions with good results. Here is the knowledge gained from these employments.

Establishing the Force.

Once the infantry companies established their firm bases, each of them organized a small reaction force.

- Typically these reaction forces were a mix of CAAT and infantry.

24-Hour Battle Rhythm.

Because of the 24-hour a day (for four days) nature of the experiment, manning of a reaction force that was alert and reasonably rested/battle ready was very challenging for each company.

- Competing manpower requirements were:
 - Reasonable sleep plan.
 - Manning the company defensive perimeter.

- Maintaining patrols in the area of responsibility.

Best Use of the Reaction Force.

Reaction forces often do not arrive in time to affect the fight, because of the spontaneous and fleeting nature of combat in the urban area. However:

- On a number of occasions, company reaction forces were effectively maneuvered to intercept or cut off a fleeting enemy following an engagement with a patrol.

Cross Boundary Coordination in a Fluid Situation.

Company areas of responsibility were very close in the experiment and the terrain did not lend itself to easily recognized boundaries. This caused cross boundary coordination issues for reaction forces during engagements and pursuit of OPFOR.

- Once these issues were recognized, units quickly established SOPs for mission support planning, coordination with adjacent units, and linkup procedures.
 - This intra battalion procedure was not sufficiently developed during the planning.
- As the UCAX progressed, units got better at cross boundary coordination during fights and when deploying reaction forces.

Advantage of Reaction Force Mobility.

In some cases, the company reaction force was a mobile team that moved periodically to improve responsiveness. This not only improved responsiveness, but made them less predictable.

- The periodic movement provided nominal security and enabled the team to maintain a set distance from the patrol it was most likely to support.

GCE Warfighting Objective #3. Assess the adequacy of the escalation of force TTPs.

TTPs seemed to be adequate for the situations presented during the experiment. These TTPs are closely linked to the rules of engagements (ROE). We saw that Marines were understood the importance of knowing the general and specific ROE while being very clear on the fact that ROE never denied them the right of self-defense. There were no noted problems with inappropriate use of force. BLUFOR did not have all the non-lethal (NL) assets normally available to a deploying unit, and noted that NL training was needed before a unit was given a peacekeeping mission. ProMet has not included the NL training in the BUST package because it is a mature (not currently used in experiments) program, but agrees with the unit's comments on that it is needed.

GCE Warfighting Objective #4. Evaluate the satellite patrol concept across the range of MOUT from Block II peacekeeping through Block III, lethal battle.

Comments from BLUFOR and particularly the OPFOR confirm that satellite patrolling is a viable concept. For example, OPFOR stated that they had problems dealing with the dispersed, unpredictable and seemingly random movement of the patrol sub-elements. Overall, it made OPFOR operations more risky and difficult. This greatly assisted in taking away some of the *defender's* advantage.

- Because satellite patrolling is a new concept to Marine forces, it takes more training time than other urban patrol training. However, ProMet experience has shown that once a unit grasps the concept, they perform it as well as any other patrolling technique.

- The standard Marine Corps infantry organization is an effective structure to use as the base unit for satellite patrolling.
- Satellite patrolling was effective during Block II and Block III situations in this experiment.
- Satellite patrolling with CAAT vehicles and other mechanized assets, though more difficult to execute, seems to be viable as well.
- Additional work is needed to develop better SOPs and battle drills.

GCE Warfighting Objective #5. Assess the adequacy of the TTPs for checkpoint operations (vehicle and personnel searches) and hasty building searches.

Checkpoint Operations and Personnel / Vehicle Searches.

- In general participants remarked that the basic techniques were adequate.
- One of the O/C Israeli company commanders who came straight from operations in Ramala, offered a personnel search technique that seemed better than ours.
 - We are currently evaluating it for inclusion in BUST.

Hasty Building Searches.

- The TTPs were readily mastered in training and were seen to be adequate to support the experiment.
- As noted in previous experiments, building search techniques are very similar to cordon and search operations.
- During UCAX, all building searches (peacekeeping and lethal battle) became more like building *clearing* (Block III) operations.
 - This may have been related to role player actions and the lack of household effects and furniture inside the buildings.
 - Or, it could have been a result of using the same forces that attacked the city to remain in place to conduct peacekeeping operations.

GCE Warfighting Objective # 6. Evaluate employment procedures and techniques used for reconnaissance and scout sniper teams in urban ground reconnaissance (UGR).

Reconnaissance Surveillance and Target Acquisition (RSTA) forces included a division reconnaissance platoon and a battalion scout sniper platoon. Based on previous RSTA lessons learned, the two assets were “pooled” in concept for planning and operations.

Existing MOUT Training for RSTA Marines.

Marine Corps reconnaissance forces and/or snipers do not receive any basic level instruction on urban reconnaissance and surveillance (R&S) unless attached to a deploying MEU. In this case they get training from the Special Operations Training Group (SOTG). However, the SOTG pre-deployment training focuses on covert missions. Therefore, these Recon Marines and snipers are left to their own devices to develop an approach to R&S in support of GCE in the urban environment. Also, if a Recon Marine or sniper has never been to the SOTG urban R&S course or the urban Sniper course, he has no knowledge of his *role* in this environment. Feedback from experiment participants recommended pre-employment MOUT training in the following subjects:

- *Urban Hide Considerations / Construction.*
 - Screen and backdrop cloth.
 - Loopholes in walls and doors providing observation on objectives.
- *Urban Hide Kits.*

- Hand drills to create loopholes.
- Hand glass cutters to create holes for firing ports for snipers.
- Portable items to construct booby traps around their observation post and for employing passive security measures.
- *Urban R&S Mission Planning Considerations*, specifically:
 - Urban communications, communicating with maneuver units.
 - Insertion / Extraction methods;
 - Clandestine / overt, in support of GCE maneuver elements,
 - Not covert methods discussed in SOTG Urban R&S course.
- *Urban CAS 6 line brief*.
- *Room and Building Clearing*.
- *Angle Fire Training*. Snipers do not currently receive sufficient training on angle firing.
 - Expose them to shooting under different conditions when targets could be at angles presented by placing snipers in overwatch positions in the urban environment.
 - The only opportunity Marines get to fire angles is at the Urban Sniper Course when they fire from a two-story platform.
 - They also shoot at Hawthorne range when snipers do rotations at MWTC, Bridgeport, CA.
 - If snipers do not attend one of these packages, they have no data or experience in firing at angles.

Sniper Rifle Deficiencies in MOUT.

RSTA Marines participating in the experiment stated that snipers might not be optimally equipped for support of maneuver elements during the assault in MOUT.

- The M40A1 and A3 rifles are highly capable and accurate bolt-action rifles, however, they limit the Sniper to a five round capacity before having to transition to rapid bolt manipulation. This may degrade the snipers ability to engage multiple *fleeting* targets of opportunity that may present themselves in the urban environment.
- The M40A1 / A3 has a loud noise signature and is likely to give away the sniper's firing position.
- The M40A3 equipped with the AN-PVS 10 scope weighs approximately 24 lbs, which can make it very difficult to move rapidly between firing positions in MOUT.
- Snipers may have a need for a heavy barreled, match-grade semi-automatic rifle outfitted with a variable powered optic, greater magazine capacity and a sound suppressor assisting in maintaining the stealth of his firing position.
 - Given this capability, the Marine sniper could engage multiple targets of opportunity and eliminate a greater number of key targets in support of the assault phase of urban combat operations.

Planning and Management of RSTA Assets.

The Sniper and Reconnaissance platoons set up a combined Surveillance and Reconnaissance Center (SARC) as a centralized location for planning missions and collecting reports. Teams were employed on multiple company objectives, typically pairing a Six-man reconnaissance team with one- or two-man sniper teams covering each objective. This allowed them to take up positions from different vantage points so they could cover the objective area from multiple angles.

SARC Operation.

The snipers maintained the sniper control net and the reconnaissance platoon maintained their recon TAC nets. The platoon HQ elements were collocated but there was still seemed to be resistance to working completely together. The SARC needs to be a combined effort and the HQ elements have got to work together in maintaining situational awareness about all R&S assets employed in the battlespace and provide combined information updates to the company commanders prior to crossing the line of departure.

Command and Control.

- The teams were employed in direct support of individual company attacks.
- R&S teams reported to the SARC prior to the company crossing the line of departure.
- Teams attempted to pass situational updates directly to platoon or company commanders.
- We saw that platoon and company commanders did not have time to process the information reports passed by R&S during the assault after crossing the line of departure.
 - They simply did not have time to process the R&S information.
 - Therefore it was usually disregarded.

RSTA Insert Methods.

The teams were inserted through the *stay behind* technique. They would patrol with an infantry security patrol during the hours of darkness to the vicinity of the their tentative observation post. Teams then moved to, clear and occupy an observation post that gave them line of sight view of the objective area. The infantry squad was the QRF during the insertion. The plan was for the infantry to remain for one hour in the AO during insertion—or until advised by the team that the insertion was complete—this never happened. After the teams moved towards their OPs from the release point, the infantry squads would leave them and move back to friendly lines.

Timing of Inserts.

Due to the limited planning time for platoon and company attacks, the reconnaissance and sniper teams were inserted the night prior to the attack.

- Snipers remained in position and supported the assault of the objectives and conducted link-up with the maneuver units, once the objective had been secured.
- Reconnaissance teams provided an information summary to the company commander prior to the platoon or company crossing the LD
 - Then they would attempt to move back to friendly lines during the attack attempting to use the confusion and chaos on the battlefield as their deception.
- Reconnaissance teams believed this to be a better method than linking up with maneuver elements during the attack because they often discovered that the maneuver elements did not maintain situational awareness on team locations.
 - This is especially true of the tanks and AAVs.
 - Recon teams discovered that the tankers and AAV vehicle commanders had no situational awareness of reconnaissance team locations and were often firing at buildings occupied by reconnaissance teams.

Special Equipment. Reconnaissance teams used the Litton M2120 “Sophie” thermal imager to attempt to discover enemy force movement at night.

- Because there was minimal OPFOR night movement, evaluation of the device is incomplete.
- Recon teams had very a high confidence level in this piece of equipment.

Team Size.

- Reconnaissance teams found the standard six-man team was too large for this environment.
 - For short duration urban operations, a four-man team was probably the optimum size.
 - Two-man sniper teams proved to be very successful because it enabled the R&S teams to cover multiple objectives from different vantage points.
-

RESULTS – WARFIGHTING EXPERIMENT – CSSE OBJECTIVES

CSSE Warfighting Objective #1. Assess the adequacy of TTPs for medical support and casualty evacuation (CASEVAC).

This experiment confirmed our belief that there is a serious shortfall in our ability to treat and handle casualties in the urban battlespace. Furthermore, it is our opinion that unless addressed, it may become a major pacing item in the fight. UCAX casualty figures were consistent with those seen in previous experiments.

When Most of the Casualties Occur.

The majority of the casualties happen during the initial assaults/movement into the battlespace. Specifically:

- BLUFOR suffered approximately 16% casualties to units in contact during the rehearsal and the main attack experiments on 8 and 9 August.
- These casualties occurred in approximately three to four hours of intense fighting.
- BLUFOR incurred approximately 95 casualties out of an estimated 594 in the playbox at the time of each attack.

Casualty Management.

Our data indicates serious shortfalls in the ability to treat, transport, and track casualties.

- By the end of the attack, the battalion aid station was overwhelmed, out of bandages and many important medicines; and—because of the absence of helicopter landing zones and ground vehicles not committed to the fight—there was no practical way to CASEVAC the wounded.
 - This is a recurring finding.
- Some of the inability to CASEVAC was due to SCLA flight restrictions and peacetime safety rules.

Casualty Management Training for MOUT.

We were told that casualty handling has not been a well-practiced event during previous training.

- The main focus for the battalion medical staff has been the routine daily medical support.
- It had not been tested in a full up battle training field event.
- This appeared to result in the lack of battle oriented SOPs.

Shortage of Medical Supplies at the Battalion Level.

The 3/7 medical staff expressed that they experienced serious shortages in the existing allowance of medical supplies found in their Authorized Medical Allowance List (AMAL) field kits.

- Based on *their* evaluation, the kits are inadequate to meet the needs for the urban fight.
- The 3/7 Battalion Surgeon has submitted—through the proper medical system channels—a requirement to reevaluate the content of this AMAL kit.

CSSE Warfighting Objective #2. Evaluate the adequacy of TTPs for tactical resupply in MOUT.

Combat Support Teams.

All of our experimentation shows that the Combat Support Teams (CSTs) formed to support forward units are effective in MOUT.

- An important enabler for the CSTs was the small, agile, low silhouette vehicle they use to move supplies forward and casualties to the rear.
 - We used John Deere Gators as a surrogate for this capability.
- A significant amount of participant feedback extolled the value of having a small vehicle that can move quickly through the urban environment.
- Relative to attrition, the Gator suffered the fewest losses of all the BLUFOR vehicles.
 - This is consistent with all previous ProMet experiments.

Small Urban Vehicle.

MCWL has been a proponent of fielding a SUV since the beginning of the Urban Warrior series of experiments in 1998. Since that time, MCWL has rented John Deere *Gators* as the surrogate for the SUV. In every experiment report the answer has been the same: the SUV is a valid concept. We have submitted a Universal Need Statement (UNS)—based on our findings—that such a capability be evaluated within the Expeditionary Force Development System (EFDS; formerly the Combat Development Process).

Again during UCAX, *Gators* were used as the surrogate SUV. BLUFOR infantry companies and the CSS element employed them for resupply and casualty evacuation. Comments from participants were very positive and consistent with previous experiments. Like all other vehicles in the playbox, they were equipped with MILES so we can state with a high degree of certainty that none of the *Gators* were hit during the UCAX. This is also consistent with previous experiments.

MCWL rented civilian variants and not the military rugged zed variants “M-Gators” used by the U.S. Army. The civilian variant is not rugged enough for continuous use and they had numerous maintenance problems. Flat tires were a particularly large problem.

Refueling and Rearming in the Urban Battlespace.

In this and other experiments we have seen a need to develop an ability to refuel and rearm mech/armor and other vehicle assets in an expeditionary manner that fits the requirements of the urban fight. During the first battalion level experiment with 3rd Bn 4th Marines, ProMet used smaller fuel bladders to *take the fuel to the vehicle* rather than have the vehicle pull out of the fight and go to the fuel. During UCAX the 3rd Bn 7th Marines opted to pull the assets out of the line and have them go back to the fuel. In the latter case, this technique seemed more time consuming and caused a lull in operations.

Logistical Support Center (LSC).

3/7 (S-4) suggested establishing a *Logistical Support Center (LSC)* that would function like a DASC for managing logistics on the urban battlespace (See 3/7 summary AAR comments in Annex A for outline of LSC activities.) This would seem to be a viable concept given the decentralized nature of the environment and the complexity of support operations. However, we did not experiment with this concept.

RESULTS – WARFIGHTING EXPERIMENT – ACE OBJECTIVES

This section includes knowledge about warfighting by the ACE that we have gathered organized and synthesized from questionnaires, interviews, debriefs, direct observation, and after action reports from the various individuals, elements, and units involved.

Overview. UCAX was the second ProMet experiment in which rotary wing (RW) aircraft were employed. RW CAS was flown primarily by AH-1W Cobras, with some UH-1N Huey CAS flights. A detachment of CH-46E, AH-1W, and UH-1N deployed to SCLA from Camp Pendleton and remained at throughout the experiment. This enabled us to evaluate the survivability of some RW ordnance delivery tactics as well as troop lift flight paths. Based on our limited flight data, we saw that properly flown RW aircraft can be effective and survive in the low-rise urban battlespace. Cobras and Hueys consistently provided effective support to heavily engaged ground units and survived.

Live Threat Simulators Used in UCAX. During all experiments involving the ACE, aircraft faced live simulations of both a radar controlled AAA gun system and a surface to air missile (SAM) threat posed by a Man Portable Air Defense System (MANPADS). Additionally, we used the Multi-Air Defensive Simulator System (MADSS) during the experiment to give a visual presentation of a surface-to-air missile launch at the helicopters. The MADSS is a simulator that uses a smoke pellet to replicate the launch and flight of a SAM launched from a MANPADS. Figure 2 is a picture of the MADSS. We were unable to effectively simulate—or measure—the threat to the aircraft from small arms, rocket propelled grenades (RPGs) or visually controlled machine guns.

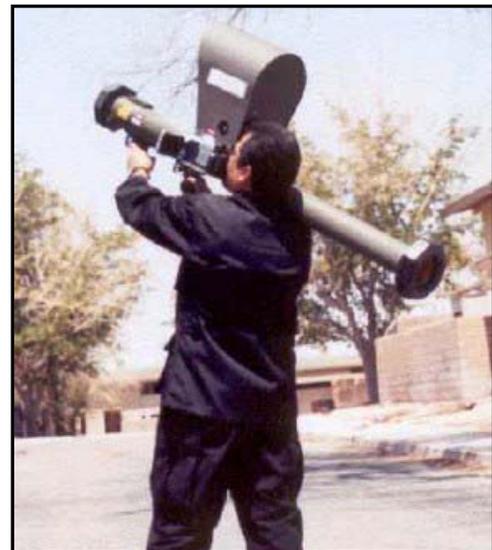


Figure 2 Multi Air Defense Simulator System (MADSS)

Limitations to UCAX Aviation Experiments.

1. *No Fixed Wing Aircraft Participation. Rotary Wing Aircraft Only.* Airspace restrictions around SCLA—an operational airport—precluded use of any fixed wing aircraft.
2. *No Chaff/Flare Deployment.* Aircraft were not permitted to deploy chaff or flare during the experiment. Therefore we focused on exposure time of the aircraft to the system, rather than trying to determine whether the system was able to successfully engage the aircraft.
3. *Airspace Restrictions at SCLA.* Due to airspace use restrictions and the need to deconflict with runway traffic, the threat systems had less difficulty finding aircraft because search area was reduced. Rather than using a normal 360-degree search, systems were able to focus their search to approximately 225 degrees because aircraft had to deconflict with the active runway at SCLA.
4. *Inability to Use Full Range of Marking Options for CAS.* Because the exercise was force-on-force, position and target marking was limited to use of colored smoke to mark friendly positions and “talk-ons” to enemy positions by FACs. For example, no mortar rounds or

tracer rounds could be used to mark enemy positions. This made target acquisition more difficult for the aircrew throughout the experiment.

5. *Restrictions on Positioning of Threat System Simulators.*
 - a. Radar Controlled Guns. Each day the SA-16 and ZSU threat simulators were positioned to support the OPFOR scheme of maneuver. However, to balance experiment goals with restrictions of the training area, the threats remained in the same location throughout that day. This had both good and bad effects. For example:
 - (1) Once aircrew understood where the threat was located, they could adapt their tactics to deal with a specific site.
 - (2) On the other hand, this generated consistent data upon which comparisons could be made on the effectiveness of various tactics flown: 1) during different missions; and, 2) by different aircrew. Because each mission was viewed from the same location.
 - b. MADSS. The two (2) MADSS remained highly mobile and were employed in a number of different locations that suited the OPFOR scheme of maneuver as the day progressed.

Experiment Factors that Uniquely Challenged the ACE.

1. *Live Ground Forces.* Unlike many *aviation only* experiments, UCAX had significant ground forces on both sides. This enabled us to examine tactics and the link between current TTPs and the ability of aircrews to:
 - a. Rapidly and effectively differentiate between friendly and enemy forces.
 - b. Without preplanning, acquire and engage “immediate” targets specified by ground forces.
 - c. Survive a realistic, mobile threat.
2. *Proximity of Opposing Forces to Each Other.* Although the enemy wore different uniforms, they used small unit, hit-and-run tactics that kept almost always within the “Danger Close” range for fire support. They remained decentralized thereby making it nearly impossible to develop an enemy “trace” or a clearly defined FEBA or FLOT. Because of these factors, it proved nearly impossible to successfully conduct a helicopter borne assault.
3. *Battlespace Geometry.* The SCLA housing area consists of 300 buildings with over 1,000 individual units in a battlespace of approximately one square kilometer. This challenged aircrews that have worked in the traditional 30 building MOUT sites where aircrews can often see the entire urban area from one position.
 - a. SCLA’s one- and two-story buildings are similar to the urban environments in many third world countries such as Somalia.
 - b. Navigation proved difficult because the buildings are situated close together and are built with only three different floor plans so all of the structures look the same.
 - c. The area is a series of cul-de-sacs and winding streets that are not oriented in a typical north-south, east-west grid pattern. This complicated both ground and air navigation.

Challenges to Effective Urban CAS. Our experience in these experiments has shown that effective urban CAS is degraded in responsiveness and effectiveness for the GCE. We have also seen it to be less survivable for the aircraft. Certain factors that are not unique to our experiments frame these challenges. These are:

- Limited/inadequate number of Forward Air Controllers (FACs) available to small units (platoon, and squad).
- Time consuming, often unnecessary/cumbersome protocols required to control the aircraft once they arrive on station.

- Challenges caused by urban terrain that limit:
 - Fields of fire/ballistic trajectories for weapons.
 - Sight lines for target acquisition and identification.
 - Aircraft survivability.
- The traditional method of clearing fires at the Battalion FSCC level is effective in deconfliction and airspace coordination, but is not optimal to engage a fleeting enemy.
 - At the company and below, it is almost impossible.
- Fleeting targets that—while lethal to our forces—are only vulnerable to our fire support for minutes rather than tens of minutes.

Therefore, to effectively employ CAS, the time/space advantage of the enemy must be minimized. One method that has been used with success is to utilize the 6-Line CAS brief instead of the traditional 9-Line CAS brief when using RW CAS. Another means to reduce the time for CAS fires is to give companies the authority to clear their own fires. This has been successful in reducing the time of request to the time ordnance impacts the target, but it has limitations because companies cannot do the same level of deconfliction as the FSCC. Second, the battle becomes decentralized down to the platoon and squad levels because of the compartmentalized terrain that the urban environment presents.

ACE Warfighting Objective #1. Evaluate employment procedures and techniques for Rotary Wing (RW) CAS as they specifically relate to:

1. Response time.
2. Target identification
3. Position marking.
4. Existing tactics.
5. Control of CAS.
6. Survivability.

CAS Response Time.

The experiment design called for OPFOR to use Chechen style hit-and-run tactics so that potential CAS targets only presented themselves for fleeting periods. In response, we used these two (2) experimental approaches to speed up the CAS process.

1. Company Fire Support Team (FiST) Members as Universal Spotters. Because we know from all of our experiments that urban combat is a decentralized fight, we tried to experiment with this as a way to give *platoons* the capability to control fires. Therefore we employed company FiST members as “universal spotters” capable of controlling all supporting fires. The goal is to give each platoon in the company the ability and communications gear to request and control supporting fires.
2. Six Line (6-Line) CAS Brief. Our second approach centered on the use of a 6-line CAS brief vice the standard 9-line CAS brief to speed the processing of air support. We based this on the statement in the MAWTS-1 ACE MOUT Manual that states: “*An abbreviated CAS brief may be more suitable for rotary wing aircraft.*” The 6-line brief proved to be very effective and was lauded by both pilots and FO/FACs.

The six-line brief is as follows:

A/C callsign _____ This is _____ — Fire Mission Over
1) My Position Marked By _____ — Friendly Location _____
2) Direction _____ — Enemy Location _____
3) Distance _____
4) Target Description _____
5) Target Marked By _____
6) Remarks _____

3. Use of the 6-line CAS Brief. During the chaotic, compressed engagements typical of our experiments, we saw that unit leaders *at all levels* had to know how to effectively request and control short-response-time, *danger close* CAS.
 - a. RW CAS was responsive—three to four minutes from request to getting an aircraft on station—once the GCE and ACE worked out the complexities of urban CAS.
 - b. Proficiency with 6-line brief:
 - (1) The ACE was proficient and familiar with the 6-Line brief prior to UCAX.
 - (2) None of the FACs in the battalion had ever worked with the 6-Line brief before UCAX.
 - (3) Classes on the 6-line brief prior to UCAX proved to be effective as Marines reported that they found the form simple and similar to the Call-For-Fire (CFF) format.
 - b. Classes on the 6-Line were given to platoon commanders, FiST teams, and F/Os in order to have the capability to control CAS down to the platoon level.
4. Terms of Reference for the 6-line Brief:
 - a. Referred to as “click and point” CAS because it does not require a map or a protractor.
 - b. Brief merely requires the terminal controller to mark both his position and the target.
 - c. CAS requested by the 6-line is understood to be immediate, unless otherwise directed by the terminal controller.

Position Marking.

1. Colored smoke was effective when used by friendly forces to mark their positions.
 - a. Smoke was most effective when friendlies responded to the aircraft’s call for the mark.
 - b. When friendly forces deployed smoke *before* it was called for, the smoke often dissipated or spread over OPFOR positions before aircraft arrived.
 - c. Because there will be several colors of smoke on the battlefield, inform the aircrews that the mark has been deployed, but leave it to the pilots to confirm the color of the mark.
 - (1) This will help to prevent them from mistaking the mark.
2. During limited nighttime sorties, several chemically luminescent lights (chemlights), both visible and IR were used.
 - a. Chemlights were an ineffective mark as aircrews were unable to visually locate them.
 - b. Chemlights were placed on top of a roof marking the friendly location.
3. The VIPIR IR strobe lights were effective for marking friendly positions at night.
 - a. This is an overt/covert individual position marking device that is currently in use in the Operating Forces.
 - b. The lights have steady/continuous and flashing modes.
 - c. Aircrews preferred the continuous mode.

4. BLUFOR was unable to mark the enemy positions with tracer fire, 40mm smoke or illumination rounds, or IR pointers.

Target Identification.

Because of the close quarter, noncontiguous nature of the urban battlespace, verifying the location of friendly forces is a challenge. It was no different in this experiment because our experiments always presented *danger close* CAS missions against an OPFOR that was usually within 100 meters of the requesting unit. And, sometimes only one building, or one floor of a building separated friendly and enemy forces. Here is what we saw:

2. During “troops in the open” CAS missions, aircrews identified OPFOR by their black uniforms.
 - a. The aircrew almost always had to be at close range (c. 500 meters) for this visual ID.
 - b. Aircrew could not always begin shooting on the “cleared hot” call because they had to make the positive ID.
3. When OPFOR were out in the open—but not in a close battle with friendlies—aircrew successfully engaged those targets (with the above noted restriction).
4. When OPFOR was inside buildings, positive ID was not possible without a target mark or a FAC with the ability to clearly and concisely talk the pilot’s “eyes-on” the target.

Effectiveness of Current Tactics.

1. Our videotapes showed us that properly flown existing tactics limited the potential for successful engagements by MANPADS and radar controlled guns.
2. Terrain masking / low altitude flight clearly reduced the number of successful engagements by OPFOR MANPADs and SAWs.
 - a. The tactics took advantage of obstructions to restrict radar and visual acquisition and fields-of-fire of surface-to-air weapons (SAWs).
(1) See Tables 1 and 2 on *MANPAD Results* and *SAW Results* below.
 - b. *However*, although limiting sight lines and engagement opportunities on properly flown aircraft, the urban terrain provides all anti air weapons multiple hard-to-find sites in which to hid and from which to engage our aircraft.
3. Aircrew that used terrain masking / minimum altitude flight had significant difficulty in acquiring targets due to the vertical relief of low-rise buildings.
4. The pop and dive profile appeared to be the most effective way to visually find/identify and engage ground level targets.
 - a. The dive gave aircrews look down angle that mitigated some obstructions that were otherwise present in the flat / level delivery option.
 - b. It increased the ability of the CAS aircrew to acquire and engage enemy positions.
5. The radar controlled AAA was not affected as much as the MANPADS by such obstructions as trees and even electrical wires.

TABLE 1 – SAW (GUN) INFORMATION																			
Type A/C					Shot		Guidance Mode		Obstructed View		Exposure Time By A/C Type			Profile					Range
Event	CH-46	CH-53E	UH-1N	Ah-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	T/O	Holding	Ingress	Pop	Egress	Meters
1				X	X		X			X			15		X				1700
2				X	X		X		X				3					X	2200
3	X				X			X	X		11					X			910
4	X					X		X	X		11					X			570
5	X					X		X	X		2							X	360
6	X					X		X	X		3					X			770
7	X				X			X		X	7							X	300
8	X				X			X		X	10							X	700
9				X	X		X			X			43		X				1200
10				X	X		X			X			40			X			1200
11				X	X		X						38			X			1100
12	X				X			X		X	9					X			630
13				X	X		X			X			23		X				2000
14	X				X			X		X	31					X			600
15	X				X			X		X	13							X	500
16				X	X		X			X			21		X				2300
17	X				X			X		X	17							X	700
18				X	X		X			X			18		X				2600
19	X					X		X	X		3					X			680
20	X				X			X		X	12							X	1000
21				X	X		X			X			22		X				1600
22				X	X		X			X			27		X				2000
23				X	X		X			X			23		X				1900
24				X	X		X			X			14					X	1500
25				X	X		X			X			22		X				2000
26				X	X		X			X			20					X	2100
27			X			X	X		X			4			X				2200
28			X			X	X		X			4						X	2600
29			X			X	X		X			2						X	2500
30			X		X		X			X		8						X	1700
31				X	X		X			X			15					X	2000

TABLE 1 – SAW (GUN) INFORMATION																			
Type A/C					Shot		Guidance Mode		Obstructed View		Exposure Time By A/C Type			Profile					Range
Event	CH-46	CH-53E	UH-1N	Ah-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	T/O	Holding	Ingress	Pop	Egress	Meters
32	X				X		X			X	12					X			1400
33	X				X		X		X		4					X			1500
34	X				X			X		X	28							X	600
35	X				X		X			X	16							X	1680
36	X				X		X			X	17							X	1500
37	X				X			X		X	10							X	1100
38	X				X			X		X	11							X	900
39	X				X			X		X	13							X	910
40	X				X			X		X	10							X	1010
41	X				X			X		X	42							X	1350
42				X	X		X		X				4		X				2400
43				X	X		X			X			27		X				1850
44				X	X			X		X			14				X		600
45				X	X		X			X			12				X		2550
46				X	X			X		X			13			X			1300
47			X		X			X		X		13						X	470
48				X		X	X			X			4			X			1200
49			X		X			X		X			8			X			800
50			X		X			X		X			26					X	280
51			X		X			X		X			18			X			1000
52				X	X		X			X			7				X		1200
53			X		X			X		X			16					X	1140
54			X		X			X		X			8			X			740
55			X		X		X		X				3			X			2500
56				X	X		X			X			7			X			2600
57				X		X	X		X				5			X			2700
58				X	X		X		X				8			X			2700
59				X	X			X		X			11					X	630
60			X			X	X			X			2			X			1500
61			X		X		X			X			15						1500
62				X	X			X		X			17					X	700
63			X		X			X		X			15			X			1200

TABLE 1 – SAW (GUN) INFORMATION																			
Type A/C					Shot		Guidance Mode		Obstructed View		Exposure Time By A/C Type			Profile				Range	
Event	CH-46	CH-53E	UH-1N	Ah-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	T/O	Holding	Ingress	Pop	Egress	Meters
64			X		X		X			X		16				X			1400
65			X		X		X			X		11						X	1700
66			X		X		X			X		45			X				1200
67				X	X		X			X			14			X			1400
68				X	X		X			X			13			X			1520
69				X	X		X			X			9					X	1470
70				X	X		X			X			6			X			2600
71	X					X		X		X	5					X			600
72				X	X			X		X			25			X			900
73				X	X		X			X			12			X			1780
74	X				X		X			X	22							X	1200
75				X		X	X			X			5			X			2500
76				X	X		X			X			4					X	1780
77				X		X	X		X				3					X	2480
78				X	X		X		X				6					X	1840
79				X		X	X			X			5					X	2040
80				X		X	X		X				1			X			2380
81			X		X		X			X	11				X				2600
82			X		X		X			X	10				X				2200
83			X		X		X			X	16				X				1500
84			X		X			X		X	12							X	1800
85				X	X			X		X			21					X	2000
86			X		X			X		X	11							X	2080
87				X	X			X		X			14					X	600
88			X		X			X		X		28				X			400
89			X		X			X		X		25				X			430
90			X			X		X		X		20				X			2690
91			X		X			X		X		30				X			360
92				X	X			X		X			15			X			400
93				X	X			X		X			9			X			800
94			X		X			X		X		11				X			680
95				X	X			X		X			9			X			510

TABLE 1 – SAW (GUN) INFORMATION																			
Type A/C					Shot		Guidance Mode		Obstructed View		Exposure Time By A/C Type			Profile				Range	
Event	CH-46	CH-53E	UH-1N	Ah-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	T/O	Holding	Ingress	Pop	Egress	Meters
96			X		X			X		X		10				X			900
97				X	X			X		X			10			X			800
98				X	X		X			X			7			X			400
99				X	X		X			X			11			X			2800
100				X	X		X			X			5					X	2250
101				X	X		X		X				11			X			1800
102				X	X		X			X			5					X	2500
103				X	X		X			X		11						X	1400
104			X		X		X			X			9					X	1100
Average Exposure Time in Seconds											13.1	14.5	13.8	Average Range				1415	

TABLE 2 – SAW (MANPADS) INFORMATION																		
Type A/C					Shot		Guidance Mode		Obstructed Mode		Exposure Time By A/C Type			Profile				
Event	CH-46	CH-53E	UH-1N	AH-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	Take Off	Holding	Ingress	Pop	Egress
1				X		X			X				0					X
2	X					X			X		0							X
3	X				X					X	9					X		
4	X				X					X	18					X		
5	X				X				X		43					X		
6	X				X				X		16							X
7				X		X			X				7					X
8	X					X			X		5					X		
9				X		X			X				2			X		
10				X	X					X			7					X
11				X		X			X				3				X	
12				X	X					X			8				X	
13				X	X					X			14			X		

TABLE 2 – SAW (MANPADS) INFORMATION																		
Event	Type A/C				Shot		Guidance Mode		Obstructed Mode		Exposure Time By A/C Type			Profile				
	CH-46	CH-53E	UH-1N	AH-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	Take Off	Holding	Ingress	Pop	Egress
14				X		X			X				2					X
15				X		X			X				3					X
16	X					X			X		4							X
17	X				X				X		11							X
18	X				X					X	46					X		
19	X					X			X		2							X
20				X	X					X			36		X			
21	X					X				X	20							X
22				X		X				X			8		X			
23				X		X			X				3					X
24	X					X				X	36					X		
25	X				X					X	26					X		
26			X		X				X			8			X			
27	X				X					X	30					X		
28			X		X					X		13				X		
29	X				X				X		16					X		
30			X			X			X			4				X		
31	X					X				X	18					X		
32				X	X					X			33		X			
33				X	X					X			14		X			
34			X		X				X		13				X			
35				X	X				X				10				X	
36			X		X				X			10				X		
37	X				X				X		8						X	
38	X				X					X	8						X	
39	X					X			X		5					X		
40				X	X					X			42			X		
41				X	X					X			9					X
42				X	X					X			26			X		
43				X	X					X			11					X
44			X		X					X			13			X		
45				X	X				X				8					X
46				X	X					X			9					X

TABLE 2 – SAW (MANPADS) INFORMATION																			
Event	Type A/C				Shot		Guidance Mode		Obstructed Mode		Exposure Time By A/C Type			Profile					
	CH-46	CH-53E	UH-1N	AH-1W	Yes	No	Radar	Optical	Yes	No	Assault	UH-1N	AH-1W	Take Off	Holding	Ingress	Pop	Egress	
47				X	X					X			4			X			
48				X	X					X			9					X	
49				X	X					X			7			X			
50				X	X					X			13					X	
51				X	X					X			14					X	
52				X	X					X			10					X	
53				X	X					X			13					X	
54				X	X				X				8			X			
55				X	X					X			7			X			
56			X		X					X		8				X			
57				X	X					X			8					X	
58				X		X			X				5				X		
59				X	X				X				8					X	
60				X	X					X			15			X			
61				X		X				X			10			X			
62			X		X					X		5				X			
63			X			X				X		7						X	
64				X	X				X				3					X	
65				X	X				X				8					X	
66				X	X					X			8					X	
Average Exposure Time in Seconds											16.5	8.5	10.7						

Explanation of Data Collection Terms Used on Tables 1 and 2.

1. *Event*—numbered in sequential order from the beginning to the end.
2. *Type of Aircraft*—each A/C had an individual event number.
3. *Shot*—from videotapes.
 - a. SAW shot recorded when the operator had lock and “fire” appeared on the display.
 - b. MANPADS shot recorded with lock-on “successful engagement” displayed.
4. *Radar/Optical*—Each SAW engagement was acquired by either radar or optical means.
 - a. Radar results based on positive system lock
 - b. Optical results based on operator using this mode to visually acquire the target.
5. *Obstructed View*—from videotape views from both systems.
6. *Exposure Time*— the time that A/C in range or in view of MANPADS or radar.
 - a. A/C visible but heavily obscured by trees or buildings, exposure time not calculated.
7. *Profile*—Specified the flight regime when A/C was exposed to each threat system.

- a. Takeoff—lift off until aircraft transitioned to forward flight.
 - b. Holding—away from the target but still inside the effective range of the threat systems.
 - c. Ingress—from holding position inbound to the landing zone/target area until the point when assault aircraft landed or CAS aircraft began their transition to the pop.
 - d. Pop—point where A/C begins climb visually locate the friendly/enemy positions; pop is complete when the aircraft pulled off the target after having “fired” simulated ordnance.
 - e. Egress—when A/C pulled off CAS target or the point when they transitioned to forward flight and turned away from the LZ until they were established back in holding or were out of the max range of the threat system.
8. *Range*. The range was only calculated for the SAW because the MANPAD system did not have range-finding capability. During each run, the range was calculated at the point where the SAW was able to get radar lock on the target. For those instances when lock-on was not achieved, the range was calculated at the point where the aircraft was closest to the threat system.

Aircrew Survivability.

1. Aircraft in our experiments could not employ on-board defensive systems (chaff, flares), so their primary defense against threat systems was terrain masking.
2. Pop up, shallow diving fire in close proximity to the intended target proved to be highly survivable.
 - a. Exposure times of 3-12 seconds significantly reduced the aircraft’s vulnerability to MANPADS and radar-controlled guns
3. Aircrews consistently identified *and* engaged the target—and showed increased survivability—when they used pop-up maneuvers and shallow diving fire in close proximity to the intended target.
4. Videotapes showed that aircrews using the above tactics consistently experienced fewer valid “shots” against them and had much lower exposure times.
5. There were significant periods of time throughout the experiment that aircrews operated without being exposed to the threats for any period of time. This was the result of effective terrain masking flight and being out of the range of the threat systems.
 - a. The periods of non-exposure are not reflected in the above tables.
6. The terrain had a degrading effect on the ability of the MANPADS seeker to lock on to aircraft.
 - a. With *any* obstruction between the MANPADS and the aircraft, the system had difficulty in achieving lock on the target.
 - b. Surprisingly, when operating (“hot”) high-capacity power lines were between the seeker and the aircraft, the system could not achieve lock.
7. The sun also degraded both systems.
 - a. The MANPADS could not *see* the aircraft coming out of the sun—and when the aircraft attacked out of the sun—the seeker could not achieve lock even if the operator pointed at them.
 - b. The SAW used optical cueing; so when coming out of the sun, the system could not see to engage the aircraft.
8. The SAW radar was effective in maintaining lock through trees.
 - a. In order to break lock, aircraft had to use the terrain or hard obstacles such as buildings.
9. The SAW used a second operator for visual cueing.

- a. When an aircraft was located, the operator was cued into the area at which time the radar would be turned on to achieve lock.
 - b. This worked for the system but caused significant delays in acquisition when aircraft were exposed.
 - c. The requirement to search such a large area was a limiting factor in the urban environment. Because there was no front line, the SAW was required to search a much larger area, thereby limiting its' effectiveness.
10. Several times during the experiment, aircraft transmitted the threat indications to the GCE. In turn, action was taken to simulate destroying the SAW.
11. We kept the threats in play even after they were destroyed through simulated CAS strikes so we could continue to collect data.

Direct Positive Control of CAS. Positive control of CAS, as specified in MAGTF doctrine is often severely restricted because of limited by visibility and lack of radios with units in close contact. It can also be restricted by the lack of a trained forward air controller (FAC) positioned with the small unit in need of the CAS.

- Buildings and rubble reduce visibility MOUT.
 - Forward air controllers and forward observers are limited by reduced horizontal and vertical sight lines.
 - This seriously degrades the ability of a controller to have “eyes on” target while controlling CAS.
- Under the current table of organization (T/O) and table of equipment (T/E):
 - There are no radios capable of communicating with aircraft below the platoon level.
 - There are no trained FACs present below the platoon level.
 - Squad leaders currently have no ability to communicate with CAS aircraft.
- The T/O of an infantry battalion includes one (1) Air Liaison Officer (ALO) and two FACs.
 - Actual manning level for a battalion is the ALO and one FAC.

Indirect Positive Control of CAS. In an attempt to overcome limited sight lines and bridge the gap in communications and lack of FACs at the small unit level, the battalion began using positive *indirect* control of CAS. As a result, there were many instances where the squad leader had “eyes on” but the control of CAS had to be done at the platoon or company level. Here is how it occurred:

- The unit requesting the CAS would get eyes on target and then communicate via intra squad radio (ISR) to the platoon/company who talked to the aircraft.
- When the unit with “eyes on” target was certain the aircraft had the target and was pointed in the right direction, he would relay through platoon/company to give the aircraft the “cleared hot” call.
 - The aircraft would then engage the target.
- We saw this work when the small unit leader had the training and understanding necessary to control CAS.
 - Although not an optimal means to request/control CAS, this method enabled small units involved in a fight to have the support even though they did not have the necessary radios or a qualified FAC.

ACE Objective #2. Evaluate employment procedures and techniques for Assault Support.

Airspace restrictions to the routes flown and types of approaches limited assault support helicopters. SCLA property use agreements and peacetime safety regulations also severely limited the number of acceptable helicopter landing zones. These same restrictions also eliminated the use of rooftop landing sites or rappelling. *Therefore, we were unable to generate any meaningful data from the tactical lifts described later in this section.*

ACE Warfighting Objective #3. Evaluate the Universal Spotter Concept.

Company Fire Support Team (FiST) as Universal Spotters.

This concept is based on separating the company Fire Support Team (FiST) into smaller teams and attaching them to each platoon. The key is to ensure that each team has a person capable of controlling surface fire support (artillery and naval gunfire) and air delivered air support. For example, the artillery and mortar F/Os could request and control CAS while the FAC could request and adjust artillery and mortar fire. The T/O for an infantry company FiST includes these assets:

- Weapons Platoon Commander.
- Artillery Forward Observer (F/O) and radio operator (R/O).
- 81mm Mortar F/O.
- FAC and two R/Os.
 - In two of the three companies.
- Communications Gear.
 - One (1) PRC-113 UHF.
 - Four (4) PRC-119 VHF.

By separating the FiST assets into “universal spotter” teams, each platoon was given the capability and communications gear to control all supporting fires within the company AOR.

Universal Spotter Results. This method was effective for these two main reasons.

- Having a dedicated “spotter” enabled the platoon commander to focus on fighting the platoon with the confidence that his spotter could request and control supporting fires when directed.
- The addition of another PRC-119 negated the need for the platoon commander to leave the company TAC net in order to control supporting arms.

This method depends on vigorous cross training so that each member of the FiST team is capable of controlling all methods of fire support.

- This training—while not currently done routinely—is made easier by the fact that all members of the FiST are already familiar with controlling fires.

ACE Warfighting Objective #4. Evaluate the Use of T/E and Non-T/E Radios.

Use of T/E Radios for Control of CAS.

Not surprisingly, in the companies equipped with only the one T/E radio, it was extremely difficult to request, communicate, and control CAS. For example, the platoon commander had to choose to control CAS over the VHF / Company TAC frequency—or—leave the company frequency and control CAS on another frequency. Depending on the tactical situation, both of these approaches may be effective when in extremis, but can have serious consequences relating to loss of situational awareness of/by units not directly involved in using the CAS.

- For purposes of the experiment, and to mitigate the loss of situational awareness, the T/E companies compensated for lack of radios by assigning its artillery F/Os (and radios) down to the platoon level.

- This arrangement proved workable for the experiment.
- However, it highlights the fact that squad leaders need access to a VHF/UHF radio for fire support in the small unit fight that is typical during MOUT.

AN/PRC-148 MBITR.

ProMet issued the hand-held AN/PRC-148 Multi Band Inter/Intra Team Radio (MBITR) to unit leaders in Kilo company—down to and including the squad leader. The PRC-148C enabled VHF/UHF covered communications thereby facilitating fire support control.

The other companies, India and Lima, used the T/E communications structure; i.e., one PRC-119. This is normally used for the platoon commander to communicate with higher.

Use of Non-T/E Radios for Control of CAS.

Kilo Company effectively used the PRC-148 at the platoon and squad level across the doctrinal nets for control of aviation. Because of this, they never had to choose between controlling fire support at the expense of SA for other small units within the company.

- Although the PRC-148 has a secure mode, all UCAX CAS control used non-secure mode.
- Covered communications were not successful between the ACE/GCE.
 - Tactical Air Direction nets are by doctrine single-channel plain text.

ACE Event Summaries

Suppression of Enemy Defenses (SEAD). We employed one team of two scout snipers to provide urban SEAD during the experiment. The team inserted the night prior to a company helicopterborne assault to provide surveillance of enemy activity around the LZ (Wren).

1. The sniper team set up in the NW corner of the attic in building A3. (See figure 2.)
2. Sniper team mission:
 - a. Provide surveillance into the Bravo sector to deny enemy access to the rooftops and open areas that could be utilized to engage landing aircraft.
3. The team accomplished their mission of denying access to the Bravo sector.
4. However, the OPFOR fouled two of the landing zones forcing friendly forces into LZ Wren.
 - a. OPFOR also took note of the determined the prevailing westerly winds and prepared an ambush in anticipation of an east-to-west approach.
 - b. Surrounded the only non-fouled LZ with triple strand concertina wire and AT mines.
 - c. OPFOR stayed concealed until aircraft landed. Both the sniper team and (2) AH-1Ws

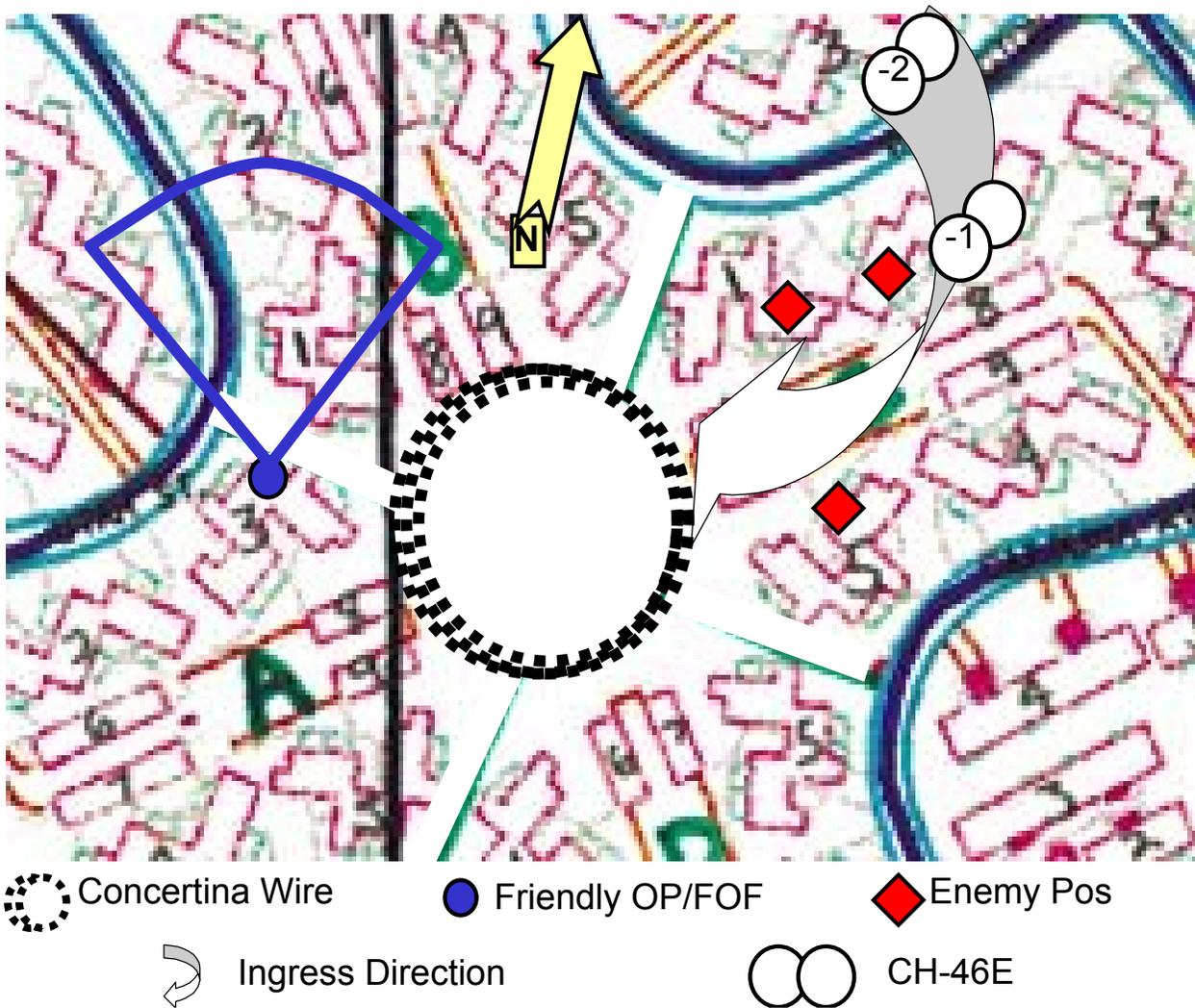


Figure 2 SEAD Insertion

assess the zone “cold” or absent of a visible threat.

5. Ambush triggered as the first wave of (2) CH-46s landed.
 - a. Had devastating effects on the helicopterborne force as OPFOR fires swept the LZ.

Analysis of Urban SEAD Experiment.

1. The Sniper Team had limited visibility from its hide—a 10” vent in the roof.
 - a. Highlights the need to saturate a specific area with multiple teams to ensure coverage.
2. Insertion for the purpose of denying rooftops can be accomplished relatively close to L-Hour. However, if the mission of urban reconnaissance is LZ surveillance to determine the feasibility of landing, that will require more observation time.
3. Criteria to determine an LZ “hot” or “cold” must be clearly defined.

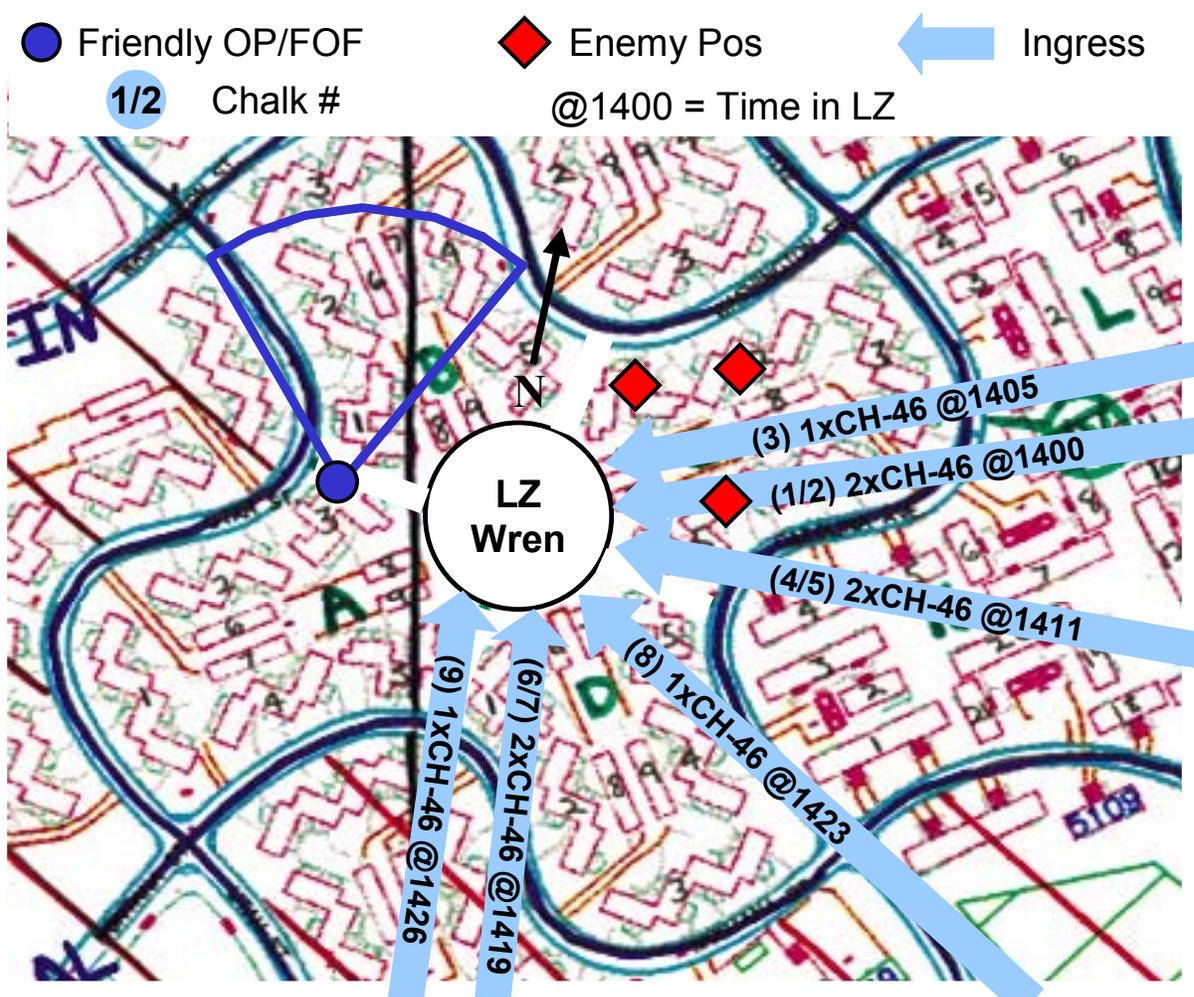


Figure 3 LZ Wren Helicopterborne Assault

- a. Not only do the normal conditions apply but also other factors such as obstacles surrounding the zone must be recognized to prevent devastating losses on the ground.

4. Detached escorts cannot simply fly over the zone and determine the zone to be “cold” simply because they did not see any obvious threats or obstacles.
 - a. In fact, during this event, they reported the zone to be “cold” when it was not.
5. The “brown out” conditions made landings difficult, but did afford the aircraft and the Marines egressing the aircraft a degree of concealment in the zone, acting in the same manner as smoke grenades.
6. When feasible, escort platforms should be in position to immediately engage pop-up threats as assault support aircraft are approaching the zone.
7. The enemy scheme of maneuver was very effective. By remaining concealed they were able to retain the advantage as Marines egressed and initiate the ambush at a moment when units were attempting to gain cover and unit integrity.
8. Enemy RPGs (simulated) had a devastating effect on approaching slow, heavy and non-maneuverable aircraft, unable to defend themselves in the 12 o’clock position.
9. Helicopterborne forces should have an obstacle clearing capability in the initial waves to prevent follow-on waves from dealing with the same obstacle.
10. Aircraft being engaged from ground threats identify and report the threat location to the GCE commander so that the threat can be eliminated.
 - a. Throughout the experiment, aircraft were engaged by ground threats, but did not relay this information to the GCE.
 - b. Also the GCE did not attempt to pull this information.
 - c. As a result aircraft were continually engaged by threats that were sometimes no more than 50 meters from friendly forces.

Company Helicopterborne Events. During the experiment, two companies were inserted via helicopter. The first lift was conducted on 08 August into LZ Wren—refer to Figure 4. The second lift was conducted on 09 August into LZ Hawk—refer to Figure 5.

08 Aug Company Insertion.

1. LZ Wren is roughly 80mx80m with a flat gradient and loose sand surface.
2. LZ is surrounded by 30’ power lines that lie about 20M off the edge of the LZ.
3. Temperatures exceeded 100 degrees F at L-Hour with light winds from the W-NW.
4. A force of 120 Marines from India Company was to be inserted into the LZ.
5. A section (two aircraft) of AH-1Ws provided escort and detached to determine the status of the zone 2 minutes prior to insertion.
6. A sniper team was positioned in building A3 to provide SEAD into the Bravo sector.
7. AH-1Ws determined the zone to be “winter” and the first section of CH-46s landed at L-Hour (1400).
8. LZ was fouled with buried AT Mines and it was surrounded with triple concertina wire.
 - a. This remained undetected until the first wave was on the deck.
9. LZ was extremely dusty making landing difficult due to reduced visibility in blowing dust.
10. The aircraft were power limited due to their weight, ambient air temperature and the high-density altitude.
11. Upon exiting the aircraft, the Marines immediately came under fire from a platoon sized enemy ambush.
12. The concertina made getting out of the zone difficult for the initial waves.

13. Initial waves of the insert were engaged by a simulated MANPADS and small arms on short final as they flew through the “Lima and Charlie” sectors.
14. AH-1Ws moved to engage the MANPADS and small arms threat in the Bravo sector, but deconfliction with friendly forces on the ground prohibited engagement.
15. After the third wave, follow-on waves shifted to a south-to-north approach to avoid the threat of the LZ.
16. Total insert time was 26 minutes. Each aircraft had to cycle back to the airfield to pick up a second wave, which accounted for much of this time.
17. There were (5) CH-46s used for the lift forcing each aircraft to insert two waves.

09 August Company Insertion.

1. Temperatures exceeded 100 degrees F at L-Hour with light winds from the West.
2. A force of 120 Marines from India Company was to be inserted into the LZ.



1/2 Chalk # @1545 = Time in LZ Route of Flight

Figure 5 Company Insertion on 9 August

3. Scheme of maneuver was for two companies to push from the northern end of the training area and clear south through LZ Wren. Then India Company would insert into Wren.
4. As Marines of 3/7 pushed south, they incurred a sizable enemy force in and around LZ Wren.
5. The battalion commander then made the decision to insert India Company into LZ Hawk.
 - a. Advantage was friendly forces controlled LZ Hawk.

- b. Disadvantage was that the helicopterborne force would have to move about 200 meters to link up with forces already on the ground.
6. The advantage of a low-threat insertion greatly outweighed the longer movement to link up on the ground, so Marines moved to increase security around the zone. Engineers worked to clear any obstacles in the zone prior to L-Hour.
7. AH-1Ws escorts provided over watch of the insertion. During the insertion, the initial waves received electronic indications of AAA fire control radar system in the area.
8. AH-1Ws scanned the area until they located the threat—a simulated ZSU-23-4.
9. AH-1Ws engaged the threat with precision guided munitions (PGMs); i.e., they met all attack geometry parameters, generated proper cockpit electronic indications and radio calls to get simulated kill on the ZSU gun.
10. Zone was extremely dusty making landing difficult because of reduced visibility.
11. Aircraft were power limited due to weight, ambient air temperature and high-density altitude.
12. Total insert time was also 26 minutes.
13. Each aircraft had to cycle back to the airfield to pick up a second wave.
 - a. There were (5) CH-46s used for the lift forcing each aircraft to insert two waves.

Multi-Air Defensive Simulator System (MADSS) Description. MADSS replicates every phase of a missile launch from activating cockpit alert indicators to creating a visual signature/smoke plume for a missile trajectory. This challenges aircrew to see the difficulties of locating and engaging one person in and amongst the urban clutter. And, because of its portability, it is easily positioned in spots that would be selected by real enemy gunners. Figure 6 shows a MADSS engagement of a UH-1N during UCAX. The particulars of the system are:

- Mobility.
 - Lightweight (19 lbs), man portable on foot.
 - Can be operated by one person.
 - Is not tied to electric power/generator.
- Capability.
 - Replicates the launch plume and ensuing ascent with a smoke cartridge.
 - Fires smoke cartridges up to 400 feet altitude.
 - Smoke cartridge is a powder tablet that poses no danger to aircraft.
 - Incorporates an eye-safe laser tracking device that activates the AVR-2 Laser Detection Device on the aircraft.
 - Simulating “laser beam riding” systems.
- Low cost expendable “Smoky SAM” cartridge—at \$3.00 each.



Figure 6 MADSS Engagement of UH-1N

- System is igniterless so there is no danger of pre-launch ignition of the cartridge.
- Has video capability that records all engagements for debrief purposes.

Results of MADSS Employment During UCAX. The MADSS proved to be an effective threat simulator that significantly added to the experiment realism. One (1) MADSS and operator were attached to the OPFOR and employed in their scheme of maneuver. Here are its results:

1. 180 Stinger MADSS cartridges were launched at CH-46E, AH-1W, and UH-1N aircraft.
 - a. There were zero (0) malfunctions or misfires.
2. All aircrews that flew against the MADSS reported the system was highly effective and made them choose proper tactics for mission completion in a MANPADS environment.
 - a. They stated that it could fill a current gap in training against MANPADS systems.
3. Aircrews were able to visually locate a MANPADS launch—the missile smoke trail—from several kilometers away.
4. MADSS launches were visible at night because, in addition to the flash at initial launch, the cartridge has an easily seen orange glow associated with its ascent.
5. UH-1N aircrews routinely picked up indications of MADSS-generated laser energy on the AVR-2 laser detection device when operating within range of the system.
6. Cartridges used in the MADSS are identical to those used on the Omega-36 Weapons Effects Simulator that is used to simulate weapons effects on targets and vehicles.
7. The MADSS/Omega-36 is fully compatible with the Marine Corps MILES-2000.
8. MADSS is hero safe enabling it to be stored, loaded and employed aboard and from ships.

ACE/GCE Planning. Due to unplanned Ops Tempo factors, ACE representatives could not fully participate in the integrated planning with the GCE for UCAX. To some degree, this reduced the potency of the MAGTF synergy in execution, and ultimately, the decision-making process with the GCE. For example, planning for the company insert on the 8th (done by the GCE without ACE involvement) did not establish effective criteria for determining whether an LZ is hot or cold. Beyond that, aircrews were not fully aware of the GCE tactical situation or scheme of maneuver.

All simulated CAS (SIMCAS) planning was conducted over the telephone or via radio after aircraft were already airborne and checking in for mission briefs. This was an especially limiting factor during reconnaissance insert missions when the absence of knowledge about GCE priority intelligence requirements did not generate focused information pertinent to GCE maneuver.

AC 130 Gunship Employment. During UCAX, one USAF A/C-130 gunship was employed for one day and one night mission. The aircraft circled the area at 7000-10000 feet. Although this optimized firing parameters for the AC-130, it was vulnerable to MANPADS. One USAF ground controller with radio beacon accompanied the GCE FAC during the missions to assist in explaining the capabilities of the gunship. The key GCE leadership was briefed on the capabilities of the AC-130 and were familiarized with the following:

- Planning factors for use of each of the weapon system on the gunship
- 25mm, 40mm, and 105mm are employed independently with their own targeting systems enabling them to engage different targets simultaneously.
- Standard night marking for AC-130 employment is to have every soldier on the ground use infrared (IR) glint tape so that gunship crew can separate friend from foe.

- Note: This should work well when supporting small Special Forces units, but—given the fact that IR glint tape is not normally issued to standard Marine infantrymen—it would probably not work during large-scale conventional operations.
 - Other IR marking devices such as the Fire Fly or VIPIR would mark positions rather than individuals.

AC-130 Gunship Results.

- The aircraft was extremely effective in locating the friendly position with the use of the man-packed radio beacon.
- When location of friendlies could be firmly established by the radio beacon, the optics enabled the aircrew to locate enemy forces and in many instances determine the exact number of enemy soldiers in the target area.
- The threat level dictates the employment of the A/C-130s.
 - Even though it operates almost exclusively at night, it remains vulnerable to MANPADS and radar threats.

RW Aviation Summary Recommendations.

1. Conduct further experiments to determine the most effective methods for marking positions in the urban environment during day and night operations.
2. Ensure that each platoon has a marking kit consisting of:
 - a. Fluorescent air panel to mark friendly positions in daylight.
 - b. IR marking device (e.g., firefly or VIPIR light) to mark friendly positions at night.
3. Introduce or continue use of the 6-Line Brief to develop an understanding of its potential to enable aircrews to provide immediate fire support for the GCE.
4. Train personnel at platoon and squad level to understand how to control rotary wing CAS using a 6-Line briefing format.
5. Create an urban CAST trainer for FACs and F/Os to become proficiency in the unique aspects of urban CAS; e.g., restricted sight lines and indirect control measures.
 - a. Emphasize the use of the 6-line CAS brief in MOUT.
6. Create an urban CAST trainer for use by non-FAC or F/Os—primarily small unit leaders and FiST members—to increase their ability to become *universal spotters* and control CAS when necessary.
7. Continue to review the role of the FSCC in urban environments to determine if procedures should be instituted to clear fires at the company level.
8. Continue to examine the utility of breaking down the FiST team into smaller platoon level teams to provide each platoon with the capability and communications to request and control fires down to the platoon level.
9. Develop a standard map reference system for the ACE and GCE that can assist in identifying targets/zone locations visually.
 - a. The level of detail for aircrew need not be as detailed as that of the GCE.
10. Conduct further examination of the MADSS to determine its suitability to be used widely in all MAGTF training.
11. Procure enough PRC-148 MBITRs to equip the battalion FACs.
 - a. This would free up (4) ROs per battalion for other tasking.

Annex A – Summary Comments from 3/7 BUST AAR

Summary of Commander's Overview.

1. The training progressed from instruction and practical application of individual skills to the conduct of a 72-hour Battalion force-on-force final exercise. The Exercise Forces (EXFOR) were under operational control of the Commanding Officer, 3/7, and are listed in enclosure (1). Primary Instructors from MCWL Project Metropolis and Assistant Instructors from the EXFOR units instructed the Marines and Sailors of 3/7. Simunitions were employed to increase combat realism and assess the effectiveness of the tactics and training.
2. BUST (+) provided 3/7(Rein) an outstanding opportunity to learn, exercise, and experiment with new tactics, techniques, procedures, and technologies for urban warfare. The training significantly enhanced the EXFOR's ability to conduct operations and support in low-, mid- and high-intensity urban (Block 1-3) operations.

Summary of After Action Items.

1. **EXFOR Command Structure.**
 - a. Discussion. The Battalion was consequently tasked to serve simultaneously as the Command Element (CE) for both the Ground Combat Element (GCE) and the MAGTF as a whole. This put an undue burden on the Battalion Staff in the execution of routine training and maintenance operations. In addition, it required the Battalion Staff to extend beyond their normal areas of expertise. The Battalion was responsible for the coordination, employment and support of over 1000 I MEF personnel.
 - b. Recommendation. Based on the model of the Combined Arms Exercise (CAX), a distinct MAGTF CE (as opposed to an embedded CE) is required to properly employ and support the EXFOR in an urban training environment.
2. **Classroom Instruction vs. Practical Application.**
 - a. Discussion. Several training days included prolonged periods of instruction in a formal classroom environment. The EXFOR routinely had up to four hours of instruction in the SCLA Theater. After approximately two hours of instruction, the Marines attention began to wane and their retention diminished. The cramped seating and hot, humid temperatures within the theater further aggravated the loss of student attention. On Training Days 7 and 8, however, the Marines participated in a series of round robin classes/demonstrations conducted in the training area. The movement between the training sites as well as the outdoor setting invigorated the Marines and increased their interest and attention span. This less formal environment and smaller class size also prompted more questions and interaction from the students.
 - b. Recommendations.
 - (1) Restrict classroom instruction to periods of no more than two consecutive hours.
 - (2) Encourage teaching smaller-sized, on-site classes/demonstrations.
 - (3) To the extent possible, teach classes properly lighted, climate-controlled facilities.
3. **Preparatory Instruction.**
 - a. Discussion. No introductory/preparatory BUST tapes shown until Training Day 1.
 - b. Recommendation. Provide videotapes battalions prior to commencing training.

4. **Media Training.**

- a. Discussion. Forces participating in urban operations will be subject to close scrutiny by the national and international media. Internal and external media will routinely operate with Marine forces, thus “the “Strategic Corporal” must understand and be prepared to handle the media. In addition, the Marines must understand that their actions will be covered by both friendly and hostile media and can affect national objectives and policy. Limited media play was incorporated into the Block II portion of the Final Exercise (FINEX).
- b. Recommendations.
 - (1) Include a period of instruction on the media and handling media coverage of urban operations.
 - (2) Incorporate public affairs operations into BUST that include integrating public affairs, combat camera, and civilian media into routine operations and responding to friendly and hostile media interviews.

5. **Repetitive Training.**

- a. Discussion. At BUST Site 4, the Marines conducted two consecutive iterations of the attack on the Tar Paper House. This provided the units an opportunity to immediately correct and reinforce proper room clearing tactics, techniques and procedures. It also allowed the individual Marines a chance to re-think their tactics, visualize the assault, and increase movement and weapons handling muscle memory. Executing two back-to-back iterations of the attack prolonged the conduct of the training, but was highly beneficial to increasing unit coordination and individual understanding and consequently retention of room clearing techniques. Other BUST Sites executed the Tar Paper House assault only once or, alternatively, conducted two separate iterations of the attack.
- b. Recommendation. Whenever possible, conduct training in two consecutive iterations. The first to assess performance and the second to correct errors, reinforce lessons-learned, and increase muscle memory.

6. **Physical Demands of Urban Training.**

- a. Discussion. MOUT is physically demanding. This includes prolonged movement over hard, uneven, debris-strewn surfaces, sprints between buildings and rooms, breaching of obstacles, and climbing through super-surface and sub-surface spaces. While doing this, Marines wear protective equipment; e.g., flak jackets, helmets, face masks (training only), and knee and elbow pads. The man made environment retains heat, thus significantly increasing the temperature in and around buildings and rubble.
- b. Recommendations.
 - (1) Develop a MOUT-specific strength-training program and provide it to battalions as a baseline from which to build individual and unit physical abilities prior to commencing training.
 - (2) Incorporate a period of acclimatization into the BUST schedule for units coming from less severe climates.

7. **Scheduling of Rest, Recuperation, and Maintenance.**

- a. Discussion. After approximately ten days of extended and exhaustive training, the EXFOR began displaying signs of fatigue and diminished attention. The energy and enthusiasm of the Instructor Staff also began to wane. Consequently, on Training Day 10, the EXFOR and Instructor Staff were afforded one day of liberty to allow them to rest and attend to their personal needs. The Marines returned from this liberty period refreshed and reinvigorated to continue training. The liberty period also allowed the commands to establish and exercise their liberty policy and procedures. Similarly, the EXFOR required additional time in the BUST (+) schedule to maintain equipment, weapons and vehicles. Maintenance periods were crucial for the efficient functioning of the tanks, assault amphibian vehicles, light armored vehicles and heavy engineering equipment.
 - b. Recommendation.
 - (1) Include a one to two day period within BUST for the rest and recuperation of exercise and support personnel.
 - (2) Include at least two one-day maintenance periods into the training schedule to ensure that vehicles, weapons and equipment are properly serviced and maintained.
- 8. Incorporation of the Marine Corps Martial Arts Training Program (MCMATP).**
- a. Discussion. Urban operations require Marines to fight in confined spaces. This includes close quarter firing techniques as well as hand-to-hand fighting techniques. Due to the limited area to conduct fire and maneuver within and buildings and rooms, Marines must be prepared to grapple with hostile personnel. In addition, Marines must be proficient in compliance techniques in the handling of belligerent non-combatants (i.e. in quelling civil disturbances or conducting check-points). BUST (+) did not instruct or address martial arts training or its application in urban operations.
 - b. Recommendation.
 - (1) Include martial arts practical application in BUST.
 - (a) For Example. Design/develop an instructional segment that takes a team of Marines through a second story building entry, through a room clearing drill and into a close-combat/grappling fight.
- 9. Need for a Logistical Support Center.**
- a. Discussion. The chaotic, congested, and confusing nature of the urban environment make the application of precision logistics extremely problematic; e.g., logistical transport assets are lost, misdirected, or delayed in route to the forward combat forces. Similarly, such assets often return to the logistics or combat service support trains with empty loads. It appears the creation/establishment of a Logistical Support Center (LSC), with functionality similar to that of the Direct Air Support Center (DASC) could efficiently control the routing and loading of logistical lift assets. Here is how it would function:
 - (1) Each logistical lift asset would check-in with the LSC upon entering the area of operations, and report its load, destination, and proposed route.
 - (2) Based on a priority of support list, the LSC would determine the best use of this lift and its load.
 - (3) By monitoring the capacity of the streets, civilian and military traffic patterns and man-made or natural obstacles, the LSC would also determine the preferred (i.e. safest, most expedient) route for that asset.

- (4) Once the logistical supplies were delivered, the LSC would determine if remaining supplies should be distributed to other forces or whether the lift assets could accomplish an additional mission en route out of the area of operations (e.g., CASEVAC, troop or equipment movement).
- b. Recommendation. Establish a Logistical Support Center to efficiently route and employ logistical lift assets as described above.

10. **Battalion Staff Training.**

- a. Discussion. The BUST (+) Battalion Staff training was helpful in prompting the Staff to identify and discuss the myriad of factors influencing urban operations. It exercised the staff's ability to perform the deliberate planning process and provided an open forum for discussion and debate on urban operations.
- b. Recommendation. Develop the Battalion Staff Training package to include:
 - (1) Battle Staff development (and briefing) of an operations order.
 - (2) Staff subsequently execute ("fight") the operations order during a SME-guided terrain walk over the terrain described in the scenario (i.e., training area or local city).

11. **Information Operations Training.**

- a. Discussion. Forces operating in the urban environment must be understand and support the information operations being conducted by higher headquarters. To maintain legitimacy with the local populace, the operating forces must ensure that their actions reflect what is promulgated through information operations.
- b. Recommendation. Incorporate/address (in battalion training) information operations and their affects on the operating forces and indigenous population.

12. **Operational Terminology Unique to MOUT.**

- a. Discussion: The existing doctrinal operational terminology (MCRP 5-12A and MCRP 5-12C) does not include descriptive terminology emerging for MOUT and taught in BUST (e.g., penetration, thrust, swarm, go firm, satellite patrolling). Also, the existing terminology can be unclear, inapplicable or misleading when applied in an urban context (e.g., clear in zone, secure, fix) against a highly mobile, asymmetrical military, paramilitary, or terrorist force.
- b. Recommendation:
 - (1) MCCDC (MCWL, MSTP and Doctrine Division) continue to develop and define focused terminology that is useful/meaningful in execution of the *Three Block War*.
 - (2) Explain, incorporate and publish these terms as soon as possible in USMC doctrine.

13. **Movement To and From BUST Sites.**

- a. Discussion: It takes approximately twenty minutes to move by foot from the theater or assembly area to BUST site four. No movement time was planned into the BUST training schedule. This resulted in inefficiencies because Marines were unable to move from location to location in the time allotted.
- b. Recommendation: Include at least 15 minutes of movement time in the training schedule.

Annex B – BUST Training Schedule

Battalion BUST Training Schedule				
Time	Activity	Site	Instructor	Equip
WED 12 JUN — INTRODUCTION TO THE URBAN ENVIRONMENT				
Time	Activity	Site	Instructor	Equip
0800-0815	ProMet Brief	Theater	Maj Sullivan	Notebook
0800-0830	Chief Instructor Brief	Theater	Sgt Viklund	Notebook
0830-1000	Urban PME: Chechnya	Theater	Maj Power	Notebook
1000-1200	Intro to Urban Environment / Threat	Theater	Bn S-2	Notebook
1200-1300	Chow			MRE
1300-1315	Safety Brief	Theater	ProMet/Bn	RSO
1315-1400	Urban Movement	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
1400-1700	Urban Movement Practical Application	BUST 1, 2, 3, or 4		TacGear w/ PRR and PRC-148
1700-TBD	Gear Issue	Theater	Bn-If Needed	
TBD	Key Leader Brief	ProMet Office	Capt Storer	
THU 13 JUNE — ASSAULTING AND FORCIBLE ENTRY				
0815-0930	Assaulting	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
0930-0945	BREAK	BUST 1, 2, 3, or 4		
0945-1100	Forcible Entry	BUST 1, 2, 3, or 4	ProMet	ProMet Gear
1100-1200	CHOW	BUST 1, 2, 3, or 4		MRE
1200-1700	Forcible Entry Practical Application	BUST 1, 2, 3, or 4	ProMet	ProMet Gear
1200-1700	Assaulting Practical Application	BUST 1, 2, 3, or 4	ProMet	ProMet Gear
1230-1300	Commander's Estimate of Battlespace	Theater	Maj Sullivan	
TBD	Key Leader Brief	ProMet Office	Capt Storer	
FRI 14 JUN — CLEARING				
0800-0815	Safety Brief	Theater	RSO	
0815-0930	Observation and Reporting	Theater	GySgt Roundtree	Notebook
0930-0945	Urban Navigation	Theater	GySgt Barry	Black Hawk Down
0945-1015	Rubble Fighting Techniques	Theater	Sgt Viklund	Notebook
1015-1215	Introduction to Clearing	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
1215-1315	CHOW			MRE
1315-1530	Tape House Practical Application	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
1530-1730	Single Story Building Practical Application	BUST 1, 2, 3, or 4	ProMet	Tactical Gear

Battalion BUST Training Schedule				
Time	Activity	Site	Instructor	Equip
1730-1930	Multiple Story Building Practical Application	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
TBD	Key Leader Brief	ProMet Office	Capt Storer	
SAT 15 JUN — COUNTER SNIPER / PATROLLING				
0800-0815	Safety Brief	Theater	RSO	
0815-0945	Introduction to Patrolling	Theater	Sgt Viklund	Notebook
1000-1030	Urban Sniper Employment	Theater	Bn	Full Metal Jacket/Pvt Ryan
1030-1045	BREAK			
1045-1130	Introduction to Counter Sniper Ops	Theater	Bn	Leadership Only
1130-1230	CHOW			
1230-1930	Patrolling Practical Application	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
	Sewer Patrols	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
	Tarpaper House	BUST 1, 2, 3, or 4	ProMet	Sim Rounds
TBD	Key Leader Brief	ProMet Office	Capt Storer	
	Issue Squad patrol Order			
SUN 16 JUN — SQUAD ATTACKS / DAY AND NIGHT PATROLLING				
0800-1000	Religious Services		Bn Chaplain	
1000-1015	Safety Brief	BUST 1, 2, 3, or 4	A-RSO	
1015-1200	Patrol Prep/Rehearsal & CHOW	BUST 1, 2, 3, or 4	Bn	Tactical Gear
1200-1500	Day Urban Patrols	BUST 1, 2, 3, or 4	Bn	Sim Rounds
1500-1545	Intro to Night Considerations	Theater	GySgt Clark	Notebook
1545-1645	Key Leader Brief	ProMet Office	Maj Sullivan	
1645-2100	Patrol Prep / Rehearsals	BUST 1, 2, 3, or 4	Squad Leaders	
2100-0300	Night Urban Patrols	BUST 1, 2, 3, or 4	Bn	Tactical Gear
MON JUN 17 — ORGANIC INFANTRY WEAPON SYSTEMS AND OFFENSIVE/DEFENSIVE PLANNING				
0800-1030	Machine Guns in MOUT	Theater	Bn	Notebook
1030-1115	Weapon Systems in MOUT	Theater	Bn	Notebook
1115-1215	Mortars in MOUT	Theater	Bn	Notebook
1215-1315	CHOW			
1315-1415	Combined Arms Offense in MOUT	Theater	Capt Storer	Notebook
1415-1430	BREAK			
1430-1630	Combined Arms Defense in MOUT	Theater	Capt Walker	Notebook

Battalion BUST Training Schedule				
Time	Activity	Site	Instructor	Equip
1630-1730	CSS in MOUT	Theater	Capt Storer	Notebook
1730-1830	Key Leader Brief	ProMet Office	Capt Storer	Plt Attack Order
TUE 18 JUN — PLATOON COMBAT PATROLS				
0800-0815	Safety Brief	Theater	RSO	
0815-1200	Patrol Prep / Rehearsals	ProMet Area	Capt Bush	Tactical Gear
1200-2000	Day Urban Attacks	Op Area	Platoons	Sim Rounds
1200-1530	TEWT Tanks, AAV, LAV, CAAT	Theater	Capt Storer/Rap	
1530-Comp	Veh Maintenance	AA	Bn	
TBD	Key Leader Brief	ProMet Office	Capt Storer	
TBD	TACP Shoot	Quackenbush TA		
WED 19 JUN — MECH AND ARMOR ASSETS				
0800-1200	Intro to M1A1 Main Battle Tank	AA	Bn	Tactical Gear
	Intro to LAV-25	AA	Bn	Tactical Gear
	Intro to AAV-P7	AA	Bn	Tactical Gear
1200-1300	CHOW			
1300-1315	Safety Brief	BUST 1, 2, 3, or 4	RSO	
1315-1600	Mech/Armor PracApp	BUST 1, 2, 3, or 4	ProMet	Tactical Gear
1630-1730	Engineers in MOUT	Theater	Capt Bush	Notebook
TBD	Key Leader Brief	ProMet Office	Capt Storer	Plt Patrol Orders
TBD	TACP Shoot	Quackenbush TA		
THU 20 JUN — PLATOON MOVEMENT TO CONTACT				
0800-0815	Safety Brief	Theater	RSO	Tactical Gear
0815-0845	Medevac Procedures	Theater	Capt Rap	Notebook
0845-0930	Platoon Orders	BUST 1, 2, 3, or 4	ProMet	Plt Cdrs
0930-1300	Prep / Rehearsals / CHOW	BUST 1, 2, 3, or 4	Platoons	Tactical Gear
1300-1900	Platoon Movement to Contact	BUST 1, 2, 3, or 4	Platoons	Sim Rounds
TBD	Key leader Brief	ProMet Office	Capt Storer	Plt Attack Order
TBD	TACP Shoot	Quackenbush TA		
FRI 21 JUN — PLATOON COMBINED ARMS ATTACK				
0800-0815	Safety Brief	BUST 1, 2, 3, or 4	RSO	Tactical Gear
0800-1100	Bn Staff Training / Wargame	ProMet office	Maj Sullivan	Bn Staff
0815-1100	Plt Orders / Rehearsals / CHOW	BUST 1, 2, 3, or 4	Platoons	
1100-1900	Plt Combined Arms Attack	BUST 1, 2, 3, or 4		
TBD	Key Leader Brief	ProMet Office	Capt Storer	Company Order
SAT 22 JUN — COMPANY MOVEMENT TO CONTACT				

Battalion BUST Training Schedule				
Time	Activity	Site	Instructor	Equip
0800-0815	Safety Brief	BUST 1, 2, 3, or 4	A-RSO	Tactical Gear
0800-100	Bn Staff Training / Wargame	ProMet Office	Maj Sullivan	
0815-1100	Company Orders / Rehearsals	BUST 1, 2, 3, or 4	Co Commanders	Tactical Gear
1100-1630	Company Movement to Contact	BUST 1, 2, 3, or 4	Co Commanders	Sim Rounds
1630-1900	Company Orders / Rehearsals	BUST 1, 2, 3, or 4	Co Commanders	
1900-2300	Company Combined Arms Attack	BUST 1, 2, 3, or 4	Co Commanders	Sim Rounds
TBD	Key leader Brief	ProMet Office	Capt Storer	Company Day Attack Order
SUN 23 JUN — COMPANY COMBINED ARMS ATTACK				
0800-1000	Religious Services		Bn Chaplain	
0800-1100	Bn Staff Training / Wargame	ProMet Office	Maj Sullivan	
1000-1015	Safety Brief	BUST 1, 2, 3, or 4	A-RSO	
1015-1200	Company Rehearsals	BUST 1, 2, 3, or 4	Co Commanders	Tactical Gear
1200-1800	Company Combined Arms Urban Attack	BUST 1, 2, 3, or 4	Co Commanders	Sim Rounds
TBD	Key Leader Brief	ProMet Office	Capt Storer	
MON 24 JUN — PEACEKEEPING / PEACE ENFORCEMENT BUST				
1000-1100	Kosovo PME	Theater	Maj Sullivan	Tactical Gear
1100-1145	ROE	Theater	Maj Power	
1145-1245	CHOW			
1245-1330	Force Continuum	Theater	Capt Rapisarda	
1330-1445	Communication Skills	Theater	Capt Storer	
1445-1600	Personnel Searches	Theater	Capt Bush	
1600-1730	Personnel Searches Practical Application	BUST 1, 2, 3, or 4	ProMet	
1730-1930	Night Squad Patrols	BUST 1, 2, 3, or 4	ProMet	India Company
TBD	Key leader Brief	ProMet Office	Capt Storer	
TUE 25 JUN — SEARCHES				
1000-1100	Vehicle Searches	Theater	Capt Rapisarda	Notebook
1100-1200	House Searches	Theater	Sgt Viklund	
1200-1300	CHOW			
1300-1430	Checkpoint Ops	Theater	ProMet	
1430-1445	Safety Brief	Theater	RSO	
1445-1730	Search/Checkpoint Practical Application	BUST 1, 2, 3, or 4	ProMet	
1730-1900	Night Squad Patrols	BUST 1, 2, 3, or 4	ProMet	Kilo Company
TBD	Key Leader Brief	ProMet office	Capt Storer	

Battalion BUST Training Schedule				
Time	Activity	Site	Instructor	Equip
WED 26 JUN — PLATOON SATELLITE PATROLLING				
1000-1015	Safety Brief	Theater	RSO	
1015-1130	Satellite Patrolling Techniques	Theater	Sgt Viklund	
1130-1230	CHOW			
1230-1430	Individual/Team Practical Application	BUST 1, 2, 3, or 4	ProMet	
1300-1500	Co Patrol Base Ops TEWT	Theater	Maj Sullivan	Key Leaders
1430-1730	Plt Patrol Practical Application	BUST 1, 2, 3, or 4	ProMet	Sim Rounds
1500-1630	Air Support in MOUT	Theater	Capt Butler	Notebook
1730-1930	Night Squad Patrols	BUST 1, 2, 3, or 4	ProMet	Lima Company
TBD	Key Leader Brief	ProMet Office	Capt Storer	
THU 27 JUN — PLATOON COMBINED ARMS SATELLITE PATROLLING				
0800-0815	Safety Brief	BUST 1, 2, 3, or 4	A-RSO	Tactical Gear
0815-1300	Patrol Rehearsals / CHOW	BUST 1, 2, 3, or 4	Capt Bush	Sim Rounds
1300-1600	Conduct Day Combined Arms Patrols	BUST 1, 2, 3, or 4	ProMet	
1600-1700	CHOW / Frag Order			
1700-TBD	Night Combined Arms Patrols	BUST 1, 2, 3, or 4	ProMet	
TBD	Key Leader Brief	ProMet Office	Capt Storer	
FRI 28 — JUN BN FEX				
1145-1200	Safety Brief	Theater	RSO	Tactical Gear
1200-2400	Conduct Attack		Bn CO	Sim Rounds
SAT 29 JUN — BN FEX				
0800-0815	Safety Brief	Theater	RSO	Tactical Gear
0815-2359	Security Operations		Bn CO	Sim Rounds
SUN 30 JUN — BN FEX / AAR				
0001-1000	Security Operations		Bn CO	Tactical Gear
1200-1500	BUST AAR	Theater	ProMet	

Annex C – Summary Comments from 3/7 UCAX AAR

Summary of Commander's Overview.

MD-02 provided 3/7(Rein) with an unsurpassed opportunity to learn, exercise, and experiment with new tactics, techniques, procedures, and technologies for urban warfare. Thanks to the exercise infrastructure provided by MCWL and Project Metropolis (ProMet) and the unmatched training area at SCLA, the EXFOR was able to conduct Battalion-level operations in a highly realistic and intensely challenging urban environment. MD-02 significantly enhanced the EXFOR's ability to conduct operations and support in mid- and high-intensity urban environments. The EXFOR's increased combat effectiveness and reduced casualty rate were proof of the effectiveness of the BUST (+) package. Based on the superior individual and collective urban war-fighting skills developed during MD-02, I and the subordinate and supporting EXFOR element commanders enthusiastically support the establishment of a formal BUST (+) program of instruction.

Summary of After Action Items.

1. **Compromise of Reconnaissance, Surveillance Targeting and Acquisition (RSTA) Teams To Engage High-Value Targets.**
 - a. Discussion: The Battalion can employ up to six Scout Sniper Teams composed of a sniper and a scout/observer. When assigned a reconnaissance/surveillance mission, these teams are unable to employ their sniping capabilities without compromising their position and consequently their RSTA mission. We saw opportunities to engage high-value targets with direct fire weapons that warrant sacrificing the reconnaissance/ surveillance mission for effects on target. The Commander must clearly establish his criteria for compromising a RSTA position to engage a target. The team must understand these criteria in case communications are lost and they are unable to get approval to engage the target prior to insertion.
 - b. Recommendation: The Commander must determine and prioritize the criteria under which he is willing to compromise a RSTA team to engage a high-value target.

2. **The *Go Firm* Tactic.**
 - a. Discussion: By "going firm" at phase lines for extended periods of time the Battalion unintentionally gave a reprieve to the enemy forces the it was attacking. Due to the linear nature of urban streets and man-made terrain features, the enemy was able to determine the phase lines the Battalion would utilize. Armed with this knowledge the enemy was able to estimate when the attacking unit would halt its forward movement and go firm. This somewhat predictable break in the momentum of the attack gave the enemy relief from the affects of fire and maneuver, thus allowing him to rest, refit, and reinforce his positions prior to the next wave of the attack.
 - (1) Consequently, while going firm is an excellent technique for maintaining command and control in the urban environment, it does sacrifice speed and momentum. The Commander must weigh this trade-off carefully to determine the timing and location of going firm.
 - b. Recommendations:

- (1) Units “go firm” only briefly at phase lines so as to not break the momentum of the attack or relieve the enemy of pressure on the far side of the phase line.
- (2) Ensure that “go firm” points are not aligned with linear terrain features such as streets or rows of buildings to ensure that the enemy does not detect friendly patterns of operation.

3. Incorporation Air Planners

- a. Discussion: Because we were not organized as a true MAGTF, there was no MAGTF Command Element (CE) included in the MD 02 T/O. Therefore, the battalion had to assume most of those responsibilities. This left us short of planners from the ACE. Thus, aviation planners were not involved from the outset of the staff planning process to ensure that the scheme of maneuver adequately used the air platforms without subjecting them to undue risk. For example, the Battalion scheme of maneuver did not account for wind-direction and thus the attack heading for inbound assault aircraft. As a consequence, in order to land Marines safely in the hot, high-density area, the assault aircraft were required to ingress over unsecured battlespace. This action endangered the aircraft, crew and passengers.
- b. Recommendation:
 - (1) Organize as a MAGTF so that air planners are involved in the Marine Corps Planning Process (MCP) and Operations Order (OPORD) development from planning outset.

4. Forward Resuscitative Surgical Suite (FRSS)

- a. Discussion: The FRSS provided superb trauma care further forward than normally available. Embedded in the Battalion battlespace, the FRSS significantly enhanced the ability to triage and stabilize urgent and priority casualties. The FRSS is an effective means to triage and stabilize seriously injured casualties forward in the battlespace. The FRSS routinely operates on casualties for one to two hours. This time constraint drives a minimum notice to displace lead-time requirement of two hours. This timeline adds a significant burden to an infantry battalion’s logistics trains by further reducing their mobility and survivability.
- b. Recommendation: Do not employ the FRSS below the Regimental level due its restricted mobility.

5. Civil Military Affairs

Discussion: The Battalion is not properly manned, equipped, or trained to conduct civil-military affairs above the very basic level. Further, if forced into this role without assets or special training, the Battalion could possibly compromise its perceived impartiality among the population.

Recommendation:

- a. Conduct civil-military affairs planning and coordination a higher level than the battalion.
- b. If an infantry battalion is conducting separate operations without the availability (or the reach-back ability) of a properly organized command element to provide civil-military guidance, a civil-military affairs team should be attached or placed in Direct Support.

6. Civil Disturbance Training

- a. Discussion: The (BUST package did not address the subject of handling civil disturbances. In particular, tactics, techniques, and procedures (TTPs) for employment of non-lethal weapons and crowd control formations. As a result, when the Battalion was confronted with both friendly and hostile demonstrations along the perimeter of its battle position (firm base), the unit was slow and unorganized in its response. This put both the civilians and military personnel at risk.
- b. Recommendation. Amend the BUST program of instruction (POI) to include classroom and practical application in crowd control.

7. Secure Briefing Area

- a. Discussion: During stability operations, local civilian community leaders and the media frequently visited the Battalion CP. It is very challenging to host these personnel without interfering with operations.
- b. Recommendation: Establish a separate and secure briefing facility within the Battalion CP area in order to meet with civilian and media personnel. Locate it so that transiting to or from the area does not interfere with operations or compromise tactical security.

8. Collocation of The Quick Reaction Force (QRF)

- a. Discussion: The Battalion area stabilization plan called for reinforced rifle companies to be out-posted throughout the Battalion's area of operations. The QRF and Battalion CP were also out-posted in close proximity to one another, but not collocated. This configuration required both the QRF and Battalion CP to employ their own personnel and resources to maintain local security. When tasked to deploy in response to emergency situations, the QRF was required to leave personnel at its battle position to maintain security. This requirement reduced the size and capabilities of the QRF and made the remain-behind security force more vulnerable to local attacks. The QRF became another maneuver element with its own sector. While this proved effective in this specific scenario, it pulled resources away from a dedicated Battalion Reserve. By consolidating the battle positions of the QRF and a comparable force (Rifle Company (Rein) or Battalion CP) the Battalion could have achieved better economy in the employment of its manpower, firepower, security and resources.
- b. Recommendations:
 - (1) During the planning process, the commander must specifically indicate whether he desires to withhold a reserve or accept risk by committing the preponderance of his forces.
 - (2) If a reserve or QRF is tasked, collocate it with a comparable element in order to husband the battalion's combat power and provide security for both units.

9. Increased Requirement For Explosive Ordnance Disposal (EOD) Detachments

- a. Discussion: Units operating in urban areas can plan to encounter more unexploded mines and explosives than in normal combat operations. This problem is compounded because the densely packed urban terrain precludes infantry and combat engineer from destroying such munitions in place due to the risk of collateral damage.
 - (1) There is a requirement to diffuse or transport such munitions to a safe location for disposal.

- (2) Such missions require additional training for combat engineers, specifically trained explosive ordnance disposal (EOD) detachments, special bomb disposal units, or some other agency capable of de-mining.
- b. Recommendation(s):
 - (1) Units operating in urban environment should have EOD detachments embedded in their force structure or on-call.
 - (a) We think that Block II (peacekeeping) MOUT will require a greater number of EOD detachments than normally deployed for other contingency operations.

10. Registration of Civilians and Detainees

- a. Discussion: During Block II operations, the Battalion encountered numerous civilians who initially acted as noncombatants but were later revealed to be hostile militia or paramilitary force members. Had these individuals been registered (i.e., photographed and documented) when they were first encountered, we would have been better able to:
 - (1) Track actions, patterns and alliances.
 - (2) Share information with civilian law enforcement agencies
 - (3) Assist in identification of displaced, missing, injured or dead civilians.
- b. Recommendations:
 - (1) Battalion register (photograph and document) all civilian, government, military, and paramilitary persons stopped, detained, or captured.
 - (2) Equip patrols with digital camera equipment to photograph and transmit images of potentially hostile civilian personnel.

11. Fratricide Investigations During Training Events

- a. Discussion: When a simulated fratricide incident was reported, the Battalion assigned an Investigating Officer to conduct a full JAG Manual investigation of the event. The result of this investigation was:
 - (1) It alerted the Marines that the command took fratricide incidents very seriously and would take swift action if they occurred.
 - (2) It forced Marines to realize their culpability in the incident and recognize the impact of their actions. By writing statements and being interviewed, the Marines were required to seriously reflect on their involvement in the incident. This resulted in reactions of disbelief, shock and fear that they may have injured or killed a fellow Marine.
 - (3) The investigations educated and exercised the Adjutant/Legal Officer in his duties in a combat scenario.
- b. Recommendation:
 - (1) Investigate—to the fullest extent possible—all known or suspected incidences of fratricide occurring during training events. Such investigations should:
 - (a) Get interviews/statements from individuals and commanders involved in the incident.
 - (b) Identify the known or suspected causes of the incident and recommend methods to avoid or mitigate such tragic events.

Annex D – Communications Issues

Background. The IC 4008M (ICOM) Intra Squad Radio (ISR) is a small, lightweight, and low cost radio that was fielded as a temporary solution to fill the communications gap between the squad leader and his fire team leaders. Although this ISR has filled the need to provide intra-squad communications, its has these problems:

- The ISR was designed to have an 18-month life cycle.
- It has no designated replacement so when it breaks the unit loses it permanently.
- It has reached the end of the initial life cycle so there is a need to replace the capability.
- It has been misused above the squad level as an unsecure intra platoon/intra company tactical radio.

An Integrated Solution. The eventual fielding of (21) AN/PRC-148 radios for use as an Intra-Platoon Radio (IPR) to every FMF/MARFORRES Rifle Company (Ref: SON for an interim Tactical Hand Held Radio (THHR) NO. CCC1.48; CHANGE 3). This will resolve the misuse of the unsecure ISR, however there will be a need to integrate the IPR with an ISR for intra squad communications.

The Joint Tactical Radio System (JTRS) ORD does not currently include the replacement of an ISR, but only the provision for a JTRS Handheld. The JTRS Handheld Multiband Inter/Intra Team Radio would not be a realistic or cost effective solution to be used at the fire team and below level. It is also a Controlled Cryptographic Item (CCI) which can be a very difficult accountability consideration at the infantry fire team level. The fact of the matter is that there is currently not a plan in effect to replace the current ISR that has reached its life cycle and is not tactically utilized by FMF units.

UCAX Experiment with the AN/PRC-148. As described in the *ACE Warfighting Objectives Results* (earlier in the body of this report), Kilo Co 3/7 (rein) was equipped—down to the squad leader—with the AN/PRC-148C MBITR. It was also equipped—down to the fire team leader—with and the United Kingdom Personal Role Radio (PRR) down to the fire team leader during the conduct of UCAX.

- The MBITR was used as a Type I secure platoon radio by the platoon commander, platoon sergeant, and squad leaders to communicate sensitive tactical information.
- The PRR was used as an integrated intra-squad radio that physically connected to the MBITR through the use of a standard military six pin connector, enabling the squad leader to maintain simultaneous communications with the platoon and his fire team leaders.

Post Experiment Feedback on the AN/PRC-148 and the PRR. Questionnaire responses from the Kilo Co Marines and their attachments that used the MBITR and or PRR are summarized below:

1. **Rate the training you received on the operational use of the MBITR.**
 - a. Quality of training on the operational use of the MBITR was sufficient.
 - b. Quantity of training was not sufficient.

- (1) Kilo Co 3/7 was given two periods of instruction on the operational use of the MBITR, each consisting of 1.5 hours of instruction and 1.5 hours of practical application, during BUST and prior to UCAX.
 - (2) Some of the Marines that operated the MBITR during UCAX were not present for the MBITR training conducted during BUST. This issue was a contributing factor to the response of this question due to the complexity of operating and troubleshooting the MBITR.
2. **Rate the training you received on the operational use of the PRR.**
 - a. Quality *and* quantity of training on the operational use of the PRR was sufficient.
 - b. Kilo Co 3/7 was given two periods of instruction on the operational use of the PRR, each consisting of 1 hour of instruction and 1 hour of practical application.
 - (1) Some of the Marines that operated the PRR during UCAX were not present for the MBITR training conducted during BUST.
 - (2) This issue was not a contributing factor to the response of this question due to the simplicity of operating and troubleshooting the PRR.
3. **Overall, how difficult were the radios to use?**
 - a. The Marines stated overall that the MBITR was easy to use and that the PRR was very easy to use.
4. **How difficult was it to change frequencies on the MBITR?**
 - a. Most of the Marines felt that it was difficult to change frequencies on the MBITR due to the location of carriage.
 - (1) Most of the Marines placed the MBITRs in their Camelbaks, keeping it out of the way from the rest of their gear, which kept the radio out of reach to change channels.
5. **How difficult was it to change frequencies on the PRR?**
 - a. Most of the Marines felt that it was very easy to change frequencies on the PRR, which was also due to the location of carriage.
 - (1) Marines carried the PRRs high on their shoulders and well within reach of the channel selector.
6. **How difficult was it to use the MBITR and the PRR at the same time?**
 - a. Most of the Marines said that it was easy to operate the MBITR and the PRR at the same time.
7. **On average, how many times per hour did you transmit traffic on the MBITR PRR?**
 - a. Average amount of MBITR transmitted traffic was from between 11 to 20 times per hour.
8. **On average, how many times per hour did you transmit traffic on the PRR?**
 - a. Average amount of PRR transmitted traffic was from between 31 to 40 times per hour.
9. What type of message traffic did you transmit most frequently (position report, situation report, contact report, casualty report, request for fire, other)?
 - a. Most frequently message traffic over both MBITR and PRR was the position report.
10. **On average, how long did the MBITR and the PRR batteries last?**
 - a. Average duration of MBITR rechargeable lithium ion batteries was between 5 to 6 hours.

b. Average duration of PRR AA batteries was between 24 to 48 hours.

11. Did the MBITR and the PRR allow you to perform your mission more effectively?

- a. Overall, the Marines said that the combination of MBITR and PRR:
- (1) enhanced situation awareness,
 - (2) enabled communications with supporting arms attachments from the squad and fire team level, and
 - (3) was fairly easy to operate.

12. Did you experience any problems with the MBITR and the PRR during UCAX?

- a. The main problems experienced by Marines faced with operating the MBITR were:
- (1) Timing loss in SINCGARS Frequency Hopping mode with some of the older MBITR versions.
 - (2) Difficulty changing channels due to radio carriage.
 - (3) Range limitations (due to frequency or antenna used).
 - (4) Limited battery duration.
- b. The main problems the Marines addressed with the PRR were:
- (1) Limited range.
 - (2) Headset was a bit snug while worn under the Kevlar helmet.

Were the MBITR and the PRR rugged enough to support your mission?

The Marines felt that both radios were rugged enough to support their mission.

13. Did the MBITR or PRR headset or push to talk button cause you any problems in using your assigned weapon?

- a. The Marines preferred the PRR wireless push to talk device over the MBITR “hockey puck style” push to talk device.

14. How comfortable was the MBITR and PRR headset?

- a. Marines stated that the MBITR Racal “solid plastic headband” was very uncomfortable while worn either under the Kevlar helmet or soft cover.
- b. Most of the Marines liked the PRR headset, but some of them felt that it was too snug while worn under the Kevlar helmet.

15. What recommendations do you have to improve the MBITR and the PRR?

- a. MBITR—increase the battery duration, provide a method to better view the selected frequency, shorten the length of the VHF tape antenna, and replace the Racal headset.
- b. PRR—increase the range and decrease the size of the earpiece portion of the headset.

16. Do you feel that this capability should be provided to every infantry rifle platoon?

- a. The overall recommendation of the Marines that operated the MBITR and PRR was that this level of capability should be provided.

Summary.

1. Integrated ISR

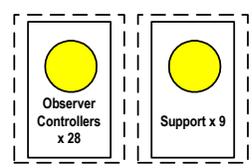
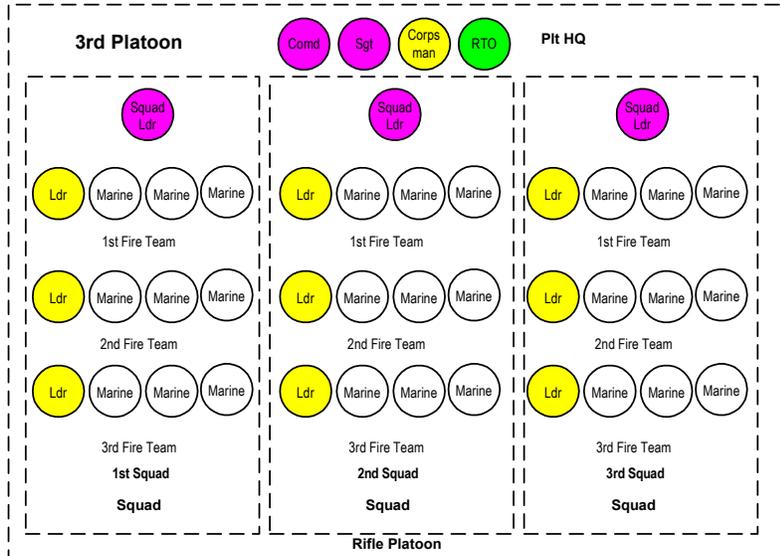
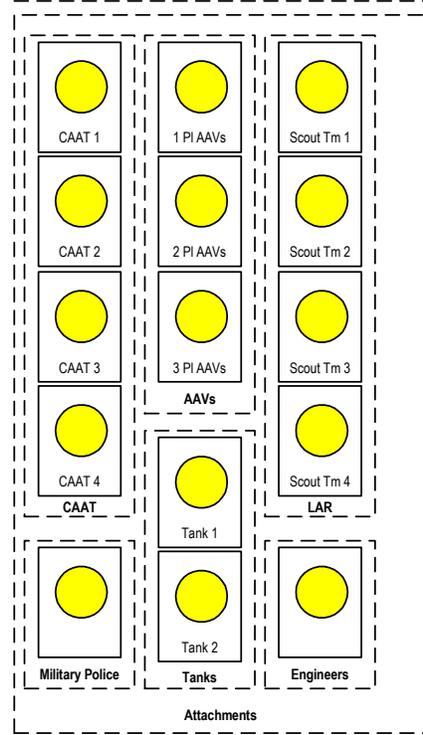
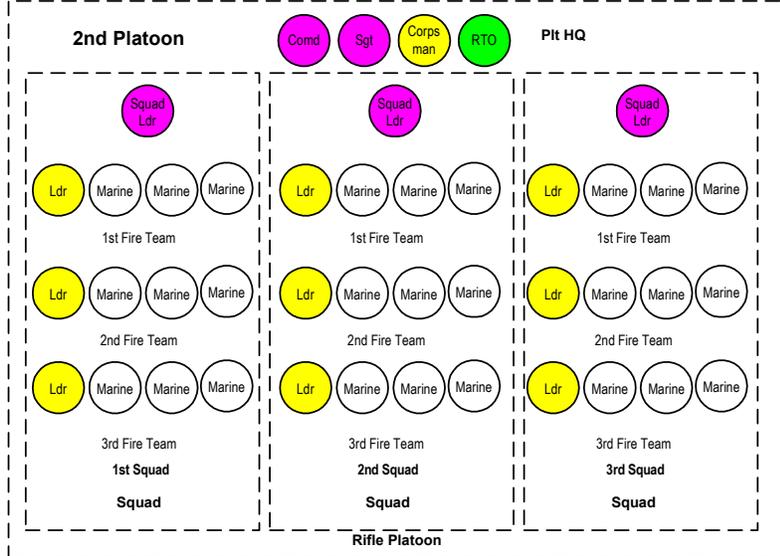
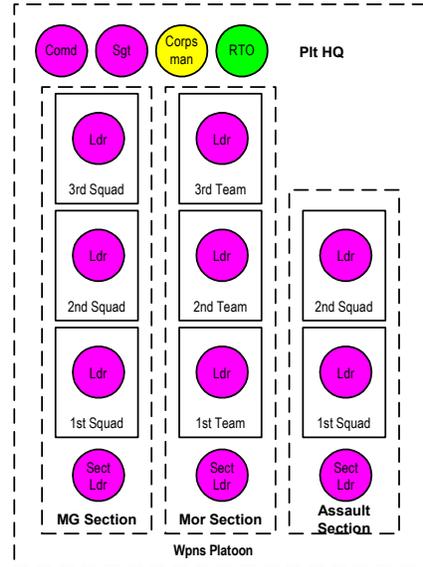
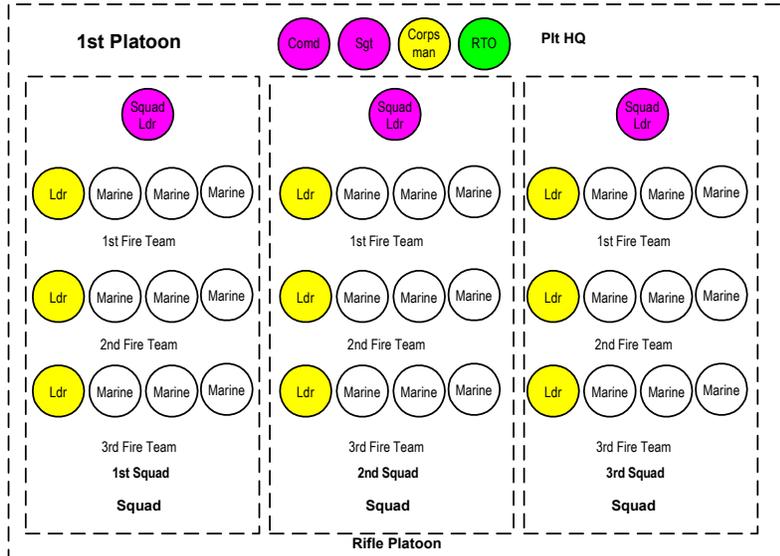
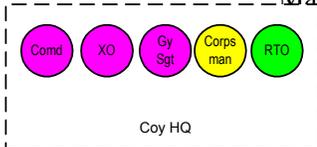
- a. Needed at the squad level to provide unsecure communications down to the fire teams and secure communications between the squad leaders and up to the platoon commander.
- b. Squad leader will also need to be able to receive simultaneous transmissions through the use of a single headset.
 - (1) Eliminates requirement for two separate headsets.

2. Communications Security

- a. One of the most important capabilities that the Integrated Intra-Squad Radio must possess is some form of communications security.
- b. One of the main reasons that some Infantry Battalions do not operationally use the current ISR is its total lack of communications security.
 - (1) They do not need a Type I Encryption solution down to the Fire Team level, but a solution that cannot be intercepted or direction found by a “Radio Shack” scanner.

An Integrated ISR UNS has signed by CG 1st MAR DIV CG as a result of their 3/7's use of the PRR during UCAX. This UNS identifies the need for a replacement ISR that can be physically integrated with the AN/PRC-148C MBITR and provides for a Limited Probability of Intercept/Limited Probability of Detection (LPI/LPD) capability.

The graphic contained on the following page depicts the distribution of the AN/PRC-148C and the PRR to K Co 3/7 during the conduct of UCAX.



Single	Dual MBITR	Dual PRC 119	Totals:	
			Single PRR	56
			Dual PRR	64
			MBITR	32
			PRC 119	5

Key

