Marine Corps Warfighting Laboratory

Project Metropolis Tactical Warrior Experiment: Phase Two
Guam, USA

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

Squad Advanced Marksman (SAM) Experiment After Action Report

January 2003

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: TACTICAL WARRIOR PHASE II: SQUAD ADVANCED MARKSMAN EXPERIMENTS.

1. This report gathers, organizes and synthesizes the knowledge gained from live fire, force-on-force experiments and specialized pre-experiment training conducted by the Marine Corps Warfighting Laboratory (MCWL) in the *Tactical Warrior* series of experiments. This training and experimentation occurred between 30 September and 30 October 2002 in and around the ranges and a closed housing area of Andersen Air Force Base, Guam, called Andersen South Training Area (ASTA).

2. The pre-experiment training included an experimental live fire syllabus using a specially modified M16A2 prototype Service Rifle configured as a surrogate for a Squad Advanced Marksman Rifle (SAM-R). This is the focus of this Quick Look.

3. We also conducted a tailored Basic Urban Skills Training (BUST) package focused on military operations in urban terrain (MOUT) to prepare the participants to employ the TTPs that form the structure of the experiment plan. We will report on the results of this when we complete our analysis of the data and publish our Final Report.

4. The live, force-on-force experiment venues—against a dedicated opposition force—included semi-open, jungle and urban terrain.

5. Experiment participants were Marines and Sailors from III Marine Expeditionary Force (III MEF). The experiment force (BLUFOR) was 2nd Platoon, Charlie Company, and Weapons Company's Combined Antiarmor Team (CAAT) Section, 1st Battalion 6th Marine Regiment, 3rd Marine Division. The opposition force (OPFOR) was an additional rifle squad from 1/6.

6. Although much more experimentation is needed to generate statistically significant data, our initial results with this limited sample size are positive. They indicate that the

combat optic can dramatically improve first round hits on targets at unknown ranges and greatly increases target identification capability for shadowed targets and during low light conditions. Beyond that, our results tend to indicate that every infantry fire team could also benefit from a SAM equipped with an optic.

Barry M. Ford
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Acting

Distribution:
Special

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EXECUTIVE SUMMARY

Introduction.

This report gathers, organizes and synthesizes the knowledge gained from live fire, force-on-force experiments and specialized pre-experiment training conducted by the Marine Corps Warfighting Laboratory (MCWL) in the *Tactical Warrior* series of experiments. This is the second experiment in the *Tactical Warrior* series and was conducted by MCWL's Project Metropolis (ProMet) team using forces from III Marine Expeditionary Force (III MEF).

Hypothesis.

The purpose of the experiment events—and the specialized training provided to prepare experiment participants—was to determine if the inclusion of riflemen trained to perform the functions of a Squad Advanced Marksman (SAM) would enhance the operational effectiveness of the infantry platoon. The hypothesis for this experiment was:

"That a properly trained and equipped rifleman performing the secondary task as a Squad Advanced Marksman in the Marine rifle squad will significantly improve the squad's and platoon's operational effectiveness."

Time and Place.

This training and experimentation occurred between 30 September and 30 October 2002, on U.S. Navy and U.S. Air Force Base ranges, and in a closed housing area of Andersen Air Force Base, Guam, called Andersen South Training Area (ASTA).

Training.

The pre-experiment training included an experimental live fire syllabus using a specially modified M16A2 prototype rifle configured as a surrogate for a Squad Advanced Marksman Rifle (SAM-R). Participants also received a tailored Basic Urban Skills Training (BUST) package focused on military operations on urbanized terrain (MOUT) to prepare them to employ the baseline tactics, techniques and procedures (TTPs) that support the experiment plan.

Key Terms.

- Squad Advanced Marksman (SAM). This is a concept to give the small unit an enhanced capability to observe, identify and engage targets.
- Squad Advanced Marksman Rifle (SAM-R). This is a weapon. It was used by MCWL during this experiment to act as a surrogate for the future service rifle.

Linkage between the term Designated Marksman (DM) and SAM.

There are at least three (3) current uses of the term *Designated Marksman (DM)* in the Marine Corps.

- 4th MEB (AT) trains and employs a DM. He is specially trained to support the Anti terrorism mission. He uses a special variant of the M-14 rifle (7.62mm).
- Marine Corps Security Forces employ a DM in support of their FAST mission. He is specially trained and is armed with the M16 Service Rifle.

- MCWL experimented with a DM concept during the Hunter Warrior and Urban Warrior experiments. Experiment outputs clearly indicated the DM had potential value to enhance the mission performance of the infantry platoon during Military Operations on Urbanized Terrain (MOUT). As a result, MCWL published *X-File 3-15.31, Designated Marksman: Precision Rifle Fire in the Marine Squad*.

The MCWL Designated Marksman, as described in the X-File, is the basis for the Squad Advanced Marksman experiment. There is no other linkage.

Forces.

Experiment participants were Marines and Sailors from III Marine Expeditionary Force (III MEF). The experiment force (BLUFOR) was 2nd Platoon, Charlie Company, and Weapons Company's Combined Antiarmor Team (CAAT) Section, 1st Battalion 6th Marine Regiment (1/6), 3rd Marine Division. In order to present a thinking enemy, the opposition force (OPFOR) was a rifle squad from 1/6. The OPFOR was allowed to employ whatever tactics they felt offered them the best chance for success.

Experiment Objectives.

The primary objectives for this phase of experimentation were focused on and limited to:

- Evaluating and refining the SAM training program.
- Evaluating the SAM's value in the infantry squad across the spectrum of conflict.
- Evaluating and refining SAM TTPs originally published in MCWL *Designated Marksman X-File 3-15.31*.
  - Including jungle, open, and MOUT.

The secondary objectives for this phase of experimentation included attempts to outline:

- Manpower issues.
- Equipment requirements.
- Training/experience requirements

An evaluation of the use of the Personal Role Radio (PRR) and squad level use of the AN/PRC-148 was embedded in the all of the SAM experiments.

Findings.

Training.

1. The SAM training time is approximately ten (10) training days, where:
   a. Live fire technical training can be accomplished in six (6) days.
   b. Employment/TTP training took an additional 3-4 days to achieve individual familiarity.
   c. Collective proficiency for effective SAM employment at the platoon level was generally achieved after five more training days.

Equipment.

1. Marksmen engaged targets more accurately with optic than with iron sights.
   a. Doubled scores during live fire.

   b. Scores showed measurable improvement at ranges beyond 250 meters (Annex B).
      (1) On both known and unknown distance courses of fire.
   c. Tended to improve poor shooter performance in all courses of fire.
   d. Improved first round hit of targets at unknown distances as compared to iron sights.
   e. We are not yet clear on the impact of the optic-bipod combination relative to the bipod without optic on the SAM-R.
2. Both the ACOG and the PVS-17 were easy to learn to use.
3. Relative to combat ID, the optic enhanced significantly the ability of the individual to:
   a. See into / through shadows, windows, foliage.
   b. ID enemy vs. noncombatant vs. friendly.
   c. Reduce potential for fratricide.
   d. Enabled Marines to acquire and engage partially camouflaged targets at ranges beyond 300 meters.
      (1) These were targets that could not be seen clearly with the naked eye during daylight.
   e. Enabled Marines to acquire and successfully engage targets during hours of limited visibility when targets could not be seen with the naked eye through iron sights.
   f. Facilitated shooter-to-target range determination.
4. The optic appeared to facilitate a point aim "reflex" sight in the close quarters fight as it could be employed effectively with both eyes open.
5. The Intra-Squad Radio—either the ICOM ISR or the Marconi Personal Role Radio (PRR) enabled the SAM to notify fire team members of the presence of threat and/or noncombatants.
   a. This capability was particularly effective during platoon level events when SAMs would cross talk to clarify friendly locations and pass info on OPFOR activity and locations.

TTPs.

1. The SAM concept—coupled with effective communication—enhanced the platoon's warfighting capability during our experiments because it repeatedly demonstrated improved capability to:
   b. Acquire, identify and successfully engage a target more rapidly than it has been able to do so in the past.
   c. Maneuver more rapidly and effectively because of improved situational awareness provided by the SAM through the ISR or PRR and the PRC 148 at the small unit level.
   d. Reduce casualties and enhance combat exchange ratio in our favor.
   e. No noncombatants were ever engaged.
2. SAM provided accurate fire in support of maneuver of the rifle squad.
3. SAM effectively gathered information through the use of their optical equipment.
4. Unit survivability and OPFOR casualties were higher when SAMs were not casualties.
5. SAMs were effective in eliminating OPFOR far in excess of their percentage of the force.
   a. As 9% of the BLUFOR strength in all events, accounted for 24% of the total OPFOR casualties.
6. Some Marines will make better SAMs than others.

   a. For example, one Lance Corporal (SAM for 3rd Squad) accounted for 71% of all SAM kills during squad events. He clearly demonstrated a better understanding of his mission and infantry skills than the other SAMs.
7. When there is only one SAM in a rifle squad, it has proven difficult to maneuver the SAM into position to assist with "seeing."
   a. When only one SAM/optic was present per rifle squad, the SAM was run to near exhaustion trying to keep up with requirements.
   b. This distribution affected momentum, formations, and command and control.
8. Communication provided by the SAM's radio is good.
   a. When he is separated from the team leader, he expands the leader's SA.
   b. When he is with the team leader, he provides redundant communication.

Perception/Attitude.

1. Marines stated that they felt more secure when operating with a SAM in their squad. This apparently stemmed from the feeling that the SAM could see and identify threat/noncombatants and, where necessary, provide accurate fire during overwatch.

Conduct of the Experiment

Experiment Schedule.

Tactical Warrior II was divided into these three phases:

- **Phase I** SAM live fire training was conducted for ten (10) Marines.
  - This was a ten-day training syllabus conducted as shown in *Annex A*.
  - *Annex B* contains a summary description of daily training activities.
- **Phase II** BUST/SAM employment training was conducted for the infantry platoon at ASTA.
  - See *Annex C* for the detailed training schedule.
- **Phase III** – SAM experimentation was conducted at ASTA.
  - Marines conducted both squad and platoon experiments.
    - Day *and* night urban events.
    - Day only jungle events (patrols).
  - See *Annex D* for the detailed experiment schedule.

Venues.

SAM live fire training was conducted on two different ranges. Known distance (KD) firing took place at Orote Point Naval Base, a COMNAVMAR facility. Unknown distance live fire was done at Andersen AFB range. Force-on-force experimentation was conducted at ASTA, a former housing area that the Marine Corps has taken over as a training area. ASTA includes:

- 1500+ acres.
- 120+ structures.
  - Sixty (60) are single story single-family houses.
  - Six (6) are large three story complex buildings.
  - Fifty-six (56) are a mix of single and two story-multi-family dwellings.
    - See ASTA map at *Annex E*.

Forces.

Experiment control consisted of the MCWL ProMet team augmented by subject matter experts (SMEs) from other Marine Corps commands, the U.S. Army, United Kingdom, and Australia. The 3rd Marine Division provided a T/O infantry platoon with a two-vehicle CAAT element as the blue force (BLUFOR), a T/O infantry squad as the opposition force (OPFOR), and a support detachment. See *Annex F* for a detailed list of all participants.

Marksmanship Cadre.

The instructor cadre was built around formally trained snipers to provide understanding of shooting with glass optics. The cadre were:

1. OIC – Captain B.J. Von Herbulis, USMC 0203/8541 Scout Sniper.
   a. Urban Ground Reconnaissance Project Officer, MCWL.
2. SNCOIC – MSgt J.W. Elder, USMC 0321/8541 Scout Sniper.
   a. Urban Ground Reconnaissance Project SNCOIC, MCWL.
3. Instructor – Color Sergeant Gary Archer, Royal Marine Commando.
   a. Instructor at Marine Corps Scout Sniper Instructor School, WTBN, Quantico VA.

4. Instructor: – GySgt L. Stone, 0369/8532.
   a. Marksmanship Programs Management Section, WTBN, Quantico, VA.
   b. Marksmanship doctrine developer.
5. Instructor – SSgt D. Rieg, 0369/8541.
   a. Chief instructor Marine Corps Scout Sniper Instructors School, WTBN, Quantico, VA.
6. Observer/Assistant Instructor – Warrant Officer Class Two Shane Armstrong, Australian Army.
   a. Master Sniper, Sniper Wing, School of Infantry.
7. Observer — CWO-4 P.J. Woellhof.
   a. Regimental Gunner, 2nd Marine Regiment.
8. Observer — GySgt M. Cheramie, USMC 0369.
   a. Regimental Assistant Training Chief, 5th Marine Regiment.
9. Observer – SFC Manning, 25th ID (Light), US Army, Ft. Lewis, Washington.
10. Observer – Sgt Flores, 25th ID (Light), US Army, Ft. Lewis, Washington.

Experiment Equipment.

1. **Rifle**. An M16 prototype rifle—designated SAM-R—was used as a surrogate for a future service rifle. Built by the Precision Weapons Section at Weapons Training Battalion, Quantico, VA, it featured:
   a. Free floated 1-7 twist stainless steel match heavy barrel.
   b. Detachable bipods w/ swivels.
   c. M16A1 trigger with the sear removed.
   d. M1913 modular rail system.

2. **Combat Optic**. The day optic used was the *Trijicon* TA31F Advanced Combat Optical Gunsight (ACOG). See figure 1. This is a 4x 32mm optic that does not require battery power. We chose this optic because it has a tritium illuminated, simple chevron pattern reticle with horizontal stadia lines allowing for range estimation to 800 meters (shown in Figure 2).

Figure 1
ACOG

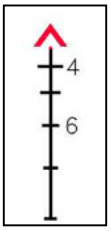


Figure 2
Reticle

   a. We chose this optic because it is unique in that it is a magnified optic with a *reflex* capability; i.e., it can be effectively used with both eyes open at short ranges.
   b. It enhances the SAM's ability to acquire and engage targets effectively during periods of limited visibility.

2. **Night Optic.** We used the AN/PVS-17B. It is currently being fielded to Marine Corps Operating Forces.

Note: the SAM-R itself was only used during the live fire. However, the Combat Optic was used during the force-on-force part of the experiment. It was mounted on the upper receiver of the simunition barrels on the M16s.

Important Caveats.

- As specified above, we used a surrogate system.
- We used a removable, collapsible bipod because we project that it would be a necessary component of the future SAM-R in order to fully maximize the capability of the optic.

Task Organization.

During the experiment, various task organizations were used at the squad and platoon level. Initially the ProMet team had planned to employ one SAM per squad but quickly decided to evaluate one per fire team in one squad. As the experiment moved from squad to platoon events, we provided optics to team leaders as well as SAMs. Time available and number of optics controlled experiment variation and distributions. See the event summaries in *Annex G* for the specific task organization of each experiment event.

Experiment Outline.

SAM Mission: Linchpin to the Experiment.

The underlying premise upon which the SAM experiment is based is that the SAM is an infantry squad member first and a SAM second. The SAM has a two-function mission. The first is to deliver accurate fire support and the second is to use his optic to gather information.

1. **Deliver accurate fire** in support of maneuver of the rifle squad, by:
    a. Covering the approach and entry of the assault element.
    b. Eliminating threats in and around the objective.
    c. Covering avenues of approach.
    d. Sealing off the objective area by fire.
    e. Providing diversionary fire for an assault element.

2. **Gather information** through the use of the optical equipment, by:
    a. Collecting and relaying vital information about the tactical situation.
    b. Reporting on priority intelligence requirements.
    c. Identifying enemy leaders or hostile individuals hiding in a crowd.
    d. Providing building analysis in MOUT operations.
    e. Reporting on the objective area in general ground combat scenarios.

SAM Training.

Ten Marines with varying degrees of marksmanship ability/qualification were trained. All of them fired the known distance (KD) course with the M16A2 and the SAM-R at the beginning and end of the training to establish a measure of performance factor. In addition to the KD course, the SAMs fired a SAM qualification course at the end of the training. The course of fire included day and night (illuminated and non illuminated) strings of fire.

SAM Experimentation Schedule.
With the goal of evaluating and refining the TTPs outlined in the MCWL X-File, we conducted semi-structured, free-play, force-on-force events. Experimentation began at the squad level and moved to the platoon level. Scenarios included a variety of threats during daytime and nighttime. We designed missions to present the best opportunities to evaluate the SAM's effectiveness.

We conducted a series of baseline events prior to the SAM TTP training. Based on the assumption that the environment will often dictate the unit's formation—thereby greatly affecting the SAM's utility—events included semi-open/MOUT and close/jungle terrain. BLUFOR conducted combat patrols against a conventional OPFOR in the semi-open and close/jungle, and conducted combat operations against an asymmetrical force in MOUT.

Communications Evaluation.
Embedded in the SAM experiment, was an evaluation of the use of the Personal Role Radio (PRR) and squad level use of the AN/PRC-148. See *Annex H*. for details and experiment findings.

Description of Tactical Experimentation.
Experiment events were set up in *lanes*, wherein numerous planned actions or activities were executed so that the staff could assess the degree to which the SAM could observe, identify, report and/or engage. This enabled observers to effectively focus on the how and why of the SAM's effect(s) on outcomes as different Marines executed the same lane activity in sequence.

In addition, each event was planned and recorded on a master scenario event list (MSEL) that guided each event and its control team to ensure consistency from event to event as the squads processed through the events. O/Cs played the *higher headquarters* that directed the experiment element (squad or platoon) as part of a simulated *larger* unit (platoon or company). A ProMet "white cell" also passed on or requested other information that would normally be present during operations. Those O/Cs assigned to control the event monitored free-play, interjected scenario MSELs, and debriefed participants at the end of events. Noncombatant role-players were introduced into each scenario to evaluate the ability of the SAM to discriminate enemy from noncombatants.

The ProMet staff provided a partial patrol order to the event element leader prior to each event. The ProMet staff also controlled/scripted OPFOR pre-engagement activities to ensure a proper "set up" for experimentation goals. However, once an engagement began, it was free-play, force-on-force without control actions by the staff.

Experiment Cycle.
The experiment cycle began well before the actual experiment event when the Event Team Leader and the Experiment Control Group (ECG)—composed of key members of the ProMet staff and selected SMEs—reconfirmed the *focus* of effort to support the general experiment concept and tactical scenario. The event team members selected MSEL items that best supported the experiment goals, identified OPFOR/role player pre-engagement activities, confirmed lanes/ locations, and finalized the patrol order. This order was passed to the experiment event/patrol

leader as soon as possible to enable basic mission planning, preparation for combat, and rehearsals. Here is an outline of the sequence in the full event cycle:

- ECG and event team leader finalize focus of experiment event.
- Team leader develops fragmentary Order (FRAGO).
  - Team leader issues FRAGO to experiment force patrol leader.
    - Experiment force preparatory time.
- Experiment force issues order (this was also confirmation brief for O/Cs).
  - Experiment force conducts mission prep and rehearsals.
- Safety brief in assembly area.
- Conduct experiment.
  - O/Cs and unit leadership reconstruct event.
  - Event team leader provides feedback to experiment force.
  - O/Cs conduct detailed debrief of elements.
  - Experiment force leaders fill in questionnaires.
  - O/Cs download MILES data from individuals.
- O/Cs review data packages and turn them in to Lead Analyst.
- ProMet staff review day's results and make adjustments as necessary for the next events.

Observer/Controllers (O/Cs).
All O/Cs were ProMet staff, MOUT instructors or SMEs from the *Marksmanship Cadre* identified earlier. They were trained on weapons effects adjudication, data collection procedures, data collection forms, and given an orientation to new TTPs being used. This enabled a detailed understanding of the SAM concept and the TTPs to be evaluated. For every experiment O/Cs were assigned to SAMs and the key leaders down to the squad level. They:

- Tracked units and individuals in mission work-up, mission briefs and rehearsals.
- Ensured participants were synchronized with the plan and understood their role in it.
- Moved tactically with the unit:
  - observing and recording activities, and
  - adjudicating engagements as required.
- Recorded their element's actions during the entire evolution.
- Led a general event reconstruction with all participants upon event completion.

For squad events, O/Cs were assigned to specific lanes (events). This meant that initially "everybody saw everybody." When the experiment moved on to platoon level events, O/Cs were assigned to individuals and remained assigned to the same person through the rest of the events. This gave us a solid knowledge of most of the talents and abilities of every key participant, thereby engendering high confidence in evaluations.

Data Collection: Live Fire.
The data collected during live fire included:

- Number of rounds fired, hits/misses, weapon configuration (i.e., with/without optic or bipod), firing positions (prone, standing), shooter to target ranges, time allowed, and meteorological conditions. See *Annex I* for specifics.

- Content of daily debriefs from both SMEs and shooters.
- Content of end of experiment questionnaires.

Data Collection: BUST.
Data on the form and content of BUST included:
- O/C observation of practical application drills (lanes).
- Daily debriefs.
- End of training questionnaires.

A general debrief and end of course critique was conducted on the final day of training to gather any other comments the students had to offer. In addition, each student and instructor filled out a comprehensive questionnaire covering the curriculum. See *Annex J* for the summary of comments and selected firing results.

Data Collection: Experiment Events.
Force-on-force experiment data was collected through direct observation by O/Cs, SMEs, 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, counting visible hits by Special Effects Small Arms Marking System (SESAMS)—formerly: *simunitions*—and on-site "calls" by O/Cs.

Following each post-event reconstruction, O/Cs guided their element through a detailed debrief flowing a set format designed for this specific experiment. This provided some remediation and set the stage for the next event. Also, all leaders completed end of event questionnaires, casualty forms and—depending on the stage of experimentation—the rest of the data package. This data package consisted of:
- O/C Activity Log.
- SAM Score Card.
  - To track MSEL items and record other SAM actions.
- SAM End of Event Questionnaire.
  - To debrief all key leaders and the SAMs.
- Standard ProMet End of Event Questionnaire.
- Casualty Forms.
- Any additional O/C observation notes.

Note: Data on the PRR and squad level use of the AN/PRC-148 was collected by a dedicated O/C who conducted system training, spot checked radios before each event, debriefed users, and distributed and collected the end of experiment questionnaire. See Annex H for more details.

Measures of Performance (MOP) for SAM Tactical Experimentation. These initially were:
- Number of targets identified.
- Number of targets engaged.
- Number of targets eliminated.
- SAM survivability.

However, as the experiment unfolded, we included these additional MOPs:
- Sightings and reporting of non-MSEL events;
  - e.g., things, and/or persons that could be used to clarify the situation.
- Discriminating between friend or foe.
  - Preventing noncombatant casualties and/or fratricide.
- Observing individuals to determine activities and whether or not they were armed.
- Providing overwatch for tactical movement.
  - Optimizing fire support.
  - Engendering confidence in Marines moving under their protection.

Results.

Quick Look vs. Final Report.
This Final Report expands on the Quick Look Report that focused solely on SAM live-fire data. It was published from Guam on 31 October 2002. This expanded the information is based on additional data reduction and analysis and includes the evaluation of employment issues. For example, a *scoring review* was conducted in order to further determine the overall effectiveness of the SAM in force-on-force events. During this review, the group reviewed the experiment event data using the MOPs and other value items to better understand the effect the SAM and optic had on operations and results.

Limiting Factors.
The following factors affected the experiment design, conduct, and results; forcing the ProMet team to focus on a limited number of possible SAM TTPs and employment scenarios.
- The squads and platoon were at T/O strength and rank, but the unit was a *composite* platoon where personnel not normally teamed together were organized into a T/O element.
  - Therefore, element cohesion and SOPs were not fully developed at the beginning of training.
- The SAM-R was used as a surrogate SAM weapon during the live fire portion of the experiment, as the M16A4 was not available.
- The M16 *MILES 2000* emitter used during experimentation was modified to enable it to work with the M16 SESAMS.
  - This was accomplished by turning off the flash requirement in the operating system.
  - The system then worked on the movement of the bolt, which often introduced unintended kills when the weapon was bumped.
  - These spurious emission kills (which were usually fratricide kills) were deleted from the data where identifiable.
- The AN/PVS-17B night sight was used as the night optic.

  - It is the "to be fielded" night optic for the Operating Forces.
- Time for training and experimentation was limited to the single month in Guam. Therefore, the ProMet team tailored (reduced) the BUST package to cover only the key TTPs needed to enable the force to employ the SAM in the urban environment.
  - Further reducing the time available for BUST, was the required training on SAM employment, small unit communication, and patrolling techniques.
- Previous experiment results have shown the value of including combined arms assets to the force mix when operating in the urban environment.
  - However, the only combined arms assets available were two .50 cal. HMMWVs.
- ASTA proved to be a good training and experiment area for MOUT, but the *jungle* was so thick and difficult to move through that the team had to cut trails and create training and experiment lanes. These trails restricted the possible movement formations, IA drills, and actions on contact and therefore, the scenarios were limited to chance contact events.

Findings.

Live-Fire.

- The proposed training package seems to be a good starting point to develop a formalized or unit SAM training program. See *Annex K* for proposed training plan.
- The SAM training time is approximately ten (10) training days, where:
  - Live fire technical training can be accomplished in six (6) days.
  - Employment/TTP training took an additional 3-4 days to achieve familiarity.
  - Collective proficiency for effective SAM employment at the platoon level was generally achieved after five more training days.
- Marksmen engaged targets more accurately with optic than with iron sights.
  - Doubled scores during live fire.
  - Scores showed significant improvement at ranges beyond 250 meters.
- All members of the experiment force achieved higher scores on <u>both</u> known and unknown distance courses of fire when using the optic.
- Relative to shooting accuracy, we are not yet clear on the impact of the optic-bipod combination relative to the bipod without optic on the SAM-R.

Optic.

- Easy to learn to use.
  - Both the ACOG and the PVS-17.
- Proved to be an adequate surrogate for the postulated SAM optic.
- Relative to <u>combat ID</u>, enhanced significantly the ability of the individual to:
  - See into / through shadows, windows, foliage.
  - ID enemy vs. noncombatant vs. friendly.
    - Reduce potential for fratricide.
- Enabled Marines to acquire and engage partially camouflaged targets at ranges beyond 300 meters.
  - These were targets that could <u>not</u> be seen clearly with the naked eye during daylight.

- Enabled Marines to acquire and successfully engage targets during hours of limited visibility when targets could not be seen with the naked eye through iron sights.
- Facilitated shooter-to-target range determination.
- Relative to rifle fire accuracy, the optic:
  - Tended to improve poor shooter performance in all courses of fire.
  - Improved first round hit of targets at unknown distances as compared to iron sights.
  - Enabled successful engagement of moving targets that blended in with their background—out to 300 meters.
- Maintained zero on the rail system of the SAM-R after being removed and replaced at least three times during live fire experimentation.
  - Both ACOG and AN/PVS-17
- Appeared to facilitate a point aim "reflex" sight in the close quarters fight as it could be employed effectively with both eyes open.
  - As derived specifically from user comments.

Employment: Force-on-Force Experimentation

- Employment of the SAM concept—coupled with effective communication—enhanced the platoon's warfighting capability during our experiments because it repeatedly demonstrated improved capability to:
  - Acquire, identify and successfully engage a target.
    - More rapidly than it has been able to do so in the past.
  - Maneuver more rapidly and effectively because of improved situational awareness provided by the SAM through the ISR/PRC 148 at the small unit level.
  - Reduce casualties and enhance combat exchange ratio in our favor.
    - No noncombatants were ever engaged.
- Having an ISR type radio was essential for SAM to operate most effectively.
  - This capability was particularly effective during platoon level events when SAMs would cross talk to clarify friendly locations and pass info on OPFOR activity and locations.
- SAM provided accurate fire in support of maneuver of the rifle squad, by:
  - Covering the approach and entry of the assault element.
  - Eliminating threats in and around the objective.
  - Covering avenues of approach.
  - Sealing off the objective area by fire.
- SAM effectively gathered information through the use of their optical equipment, by:
  - Collecting and relaying vital information about the tactical situation.
  - Reporting on priority intelligence requirements.
  - Identifying enemy leaders or hostile individuals hiding in a crowd.
  - Providing building analysis in MOUT operations.
  - Reporting on the objective area in general ground combat scenarios.
- Unit survivability and OPFOR casualties were higher when SAMs were not casualties.
- SAMs were effective in eliminating OPFOR.
  - As 9% of the BLUFOR strength in all events, accounted for 24% of the total OPFOR casualties.
- If SAMs are to be employed, one per fire team is preferable to one per squad.

- Some Marines will make better SAMs than others.
  - For example, one Lance Corporal (SAM for 3rd Squad) accounted for 71% of all SAM kills during squad events. He clearly demonstrated a better understanding of his mission and infantry skills than the other SAMs.
- The optic improves the ability of the Marine to estimate range accurately.
  - This may significantly assist other riflemen and supporting arms in first round accuracy.
- Optic durability or survivability was not an issue during training or experimentation.
  - Only one optic was hit by SESAMS during experimentation.
- The fire team is the best echelon for this capability.
  - If unable to give every rifleman an optic.
- When there is only one SAM in a rifle squad, it has proven difficult to maneuver the SAM into position to assist with "seeing"
  - When only one SAM/optic was present per rifle squad, the SAM was run to near exhaustion trying to keep up with requirements.
  - This distribution affected momentum, formations, and command and control.
- When the optic was given to the Team Leader, he tended to use it as an observation/combat ID aid—vice engagement enabler.
- Communication provided by the SAM's radio is good.
  - When he is separated from the team leader, he expands the leader's SA.
  - When he is with the team leader, he provides redundant communication.
- Marines stated that they felt more secure when operating with a SAM in their squad. This apparently stemmed from the feeling that the SAM could see and identify threat/noncombatants and, where necessary, provide accurate fire during overwatch.

Need More Information.
Further evaluation is needed to determine:

- If an ACOG-like optic could assist in range determination to improve first round hit probability for other weapons and fire support systems such as the M203 and indirect fire systems.
- The effect the bipod had on accuracy versus the no-bipod and optic combination.
- The effectiveness of the SAM-R versus the future service rifle M16A4 as the SAM weapon.
- The effectiveness of the ACOG 4X optic versus a reflex type optic in the close fight.
- The sustainment training requirement for the SAM.
- The most effective SAM TTPs for inclusion in an X-file and training requirements documents.
- Who gets the optic to maximize the payoff/utility. More optics are better than fewer; however if we cannot give an optic to everybody, then who should get it?

Annex A – Live Fire Training

Training Day 1 – 30 September 2002. A day of classes to give Marines an understanding of the background and purpose of the SAM experiment and introduce the experiment force to the instructor group, the SAM-rifle and the combat optic.

- Reviewed principles of shooting and the fundamentals of marksmanship to reinforce instruction that they have already received as Marines.
- Reinforced the combat shooting positions the Marines would use during the courses of fire.
- Allowed the Marines to snap-in and work on building their positions.

Training Day 2 – 01 October 2002. Focused on familiarization with the weight of the heavy barrel/optic/bipod and getting zero (BZO) on the SAM-R with optic on the Orote Point KD range.

- Initial BZO at the 100-yard line.
  - Conditions were sunny, hot and humid 95° Fahrenheit.
- 12-inch black bulls eye target with four 1 inch white pasties in the center of the target.
  - Not a perfect measure of 4 minutes of Angle (MOA) at 100 yards but was an acceptable zero for our training purposes.
- The position used to zero the SAM-R was the prone supported by the bipod.
- After zeros were achieved at 100 yards, the zeros were confirmed at the 200, 300 and 500-yard lines.
  - This allowed shooters to make adjustments as necessary for zero at each yard line.
  - Also allowed shooters to find a proper aim point at each yard line because the optic was ballistically compensated in meters and we were firing on yard lines.
- Shooters were given the opportunity to achieve an aim point that became a factor at the 500-yard line.
- The zero achievement and confirmation took longer than expected because the shooters were inexperienced at shooting with optics and the instructors had to spend a considerable amount of time assisting the shooters in making adjustments and utilizing the reticle pattern.
- Once zeros were achieved and confirmed, we conducted drill card one which was designed to reinforce the fundamentals of marksmanship and combat shooting positions at various yard lines.
  - Drill card 1 was only fired by the second relay before heavy rains ended the day of training.

Training Day 3 – 02 October 2002. The focus was a continuation of the fundamentals and building good combat shooting positions.

- Instructors spent a large portion of the day reinforcing the fundamentals in order to reduce the impact of this variable on the shooting to be done.
- Fired *Drill Card 1* twice with the first relay and once with the second relay.
  - Fundamentals improved and shooters showed a grasp of shooting with the optic and a comfort level with it.

- Introduced to moving targets, bobbing targets and stop-and-go targets at the 100 and 200-yard lines.
  - From the prone bipod supported position.
  - Targets were the green E silhouettes cut down to 14 inches in width.
    - The green silhouette targets blended in to the densely vegetated green background impact area.

Training Day 4 – 03 October 2002. The morning course of fire was a continuation of fundamental development and introduction to the AN/PVS-17 Night Optic.

- Course of fire was *Drill Card 1* with integrated moving, bobbing and stop-and-go targets at the 100, 200 and 300-yard lines.
- Once both relays were complete with the initial course of fire, we transitioned to zeroing the AN/PVS-17 in preparation for a night course of fire.
- We acquired a hasty zero at the 36-yard line and utilized 36 yard zero targets.
- Upon completion of the zeroing exercise, we transitioned into a class on combat close range shooting drills.
  - To instruct Marines how to rapidly transition the rifle from the low ready position to an offhand shooting position and engage targets at approximately 25 meter to their front. This evolution was repeated several times.
- Marines were introduced to shooting at close ranges <u>with both eyes open</u> utilizing the optic.
  - This allows them to engage targets and continue to scan the surrounding areas for better situational awareness.
  - ***This is a unique capability this reflex optic provides***.
- Marines were instructed on engaging targets to their left and to their right and they repeated this evolution numerous times.
- Marines were instructed on shooting while on the move using the combat glide movement technique.
- Upon completion of the combat shooting drills, we transitioned into a low-light limited visibility shoot which incorporated shooting stationary known distance targets as well as moving targets at the 200 hundred and 100 yard lines.
  - The purpose of this was to enable the Marines to achieve an understanding of how the optic assist shooters in acquiring targets in low-light conditions due to its light gathering capabilities.
- By the time the shooters reached the 100-yard line, the instructor group had a difficult time seeing the green E silhouette moving targets with the naked eye but the shooters were able to continue to positively identify and engage their targets with the optic.
  - <u>This appears to be a very valuable capability provided by this optic</u>.
- Upon completion of the limited visibility drill card for the 1st relay, we transitioned to the night drill card with artificial illumination. This consists of shooting from positions, and engaging moving targets at the 100, 200 and 300 yard lines using the optic.
  - The artificial illumination used was white star clusters.
- The last course of fire was the night drill card utilizing the AN/PVS-17 night optic, introducing Marines to shooting at night with this particular night sight.

Training Day 5 – 04 October 2002. Entailed class on range estimation and the different techniques that can be used.

- Range estimation demonstration by instructors located at various ranges in both open and in dense vegetation.
  - To give Marines an appreciation for what man-sized targets look like at various ranges in various positions through iron sights and through the optic.
  - This exercise demonstrated the ability to use the optic to positively identify partially camouflaged targets that could not be seen without the assistance of the magnified optic.
- The next evolution was a class on unknown distance shooting at the small arms range aboard Andersen Air Force Base.
  - Weather was hot, sunny humid, temperature approximately 100º Fahrenheit with approximately a 5MPH wind blowing right to left across the range.
- First sting of fire at steel targets ranging from 86 to 495 meters in five different lanes.
- Marines used the SAM-R with optic from the prone bipod supported position.
- Marines were given approximately four minutes to range each target in their lane and record them in their data book. Upon command from the instructor on the firing line, the Marines engaged their targets one at a time, from near to far in their lane.
- First string of fire: All ten shooters were cycled through the five lanes, attempting to engage all twenty steel targets.
  - Marines were given an opportunity to make corrections and re-engage targets if a first attempt misses.
  - If the shooter missed on his second attempt, it was recorded as a missed target.
  - When observed, shooters were given corrections by instructors using M49 20x spotting scopes.
- Second string of fire: Ten targets at various ranges were selected and again Marines were given time to range their targets, and upon command from the instructor on the firing line, they engaged the designated targets one at a time.
  - Shooters were given correction by instructors when shots were observed and shooters were given second round attempts at each missed target.
- The third string of fire was similar to the second but a different set of ten targets was selected to vary the ranges.

  Note: The ranges to targets were achieved by using a Leica laser range finder.

Training Day 6 – 07 October 2002. First part of training was conducted at **Orote Point** KD range. The course of fire consisted of *Drill Card 1* with LBV worn by all shooters.

- We used the *Dog* target from the 100 through 300-yard lines and the *B mod* target at the 500-yard line.
- After *Drill Card 1*, the course of fire was the moving target, bobbing target and the stop-and-go drill cards.
  - Purpose of these strings of fire was to reinforce the fundamentals and introduce Marines to shooting with their LBV on.
- Next event was confirmation of AN/PVS 17 zero, using a hasty zero at the 36-yard line.
- We transitioned to the small arms range at **Andersen AFB** for a night unknown distance shoot with the AN/PVS-17 night optic.

- Course of fire was twenty targets at various ranges from 100 to 495 meters.
- Conditions for the night unknown distance shoot were dark, overcast skies with poor illumination.

Training Day 7 – 08 October 2002. This day set up to compare the ability of the individual Marine to estimate range and engage steel targets at various unknown distances with his M16A2 service rifle with iron sights against the same course of fire used earlier with the SAM-R with the optic.

- We also fired the course of fire with the SAM-R using iron sights to get baseline weapon accuracy data.
- First course of fire consisted of twenty targets to initially be engaged with the M16A2 and iron sights utilizing the unsupported prone position and the loop sling.
- Next course of fire was from the same position but on 10 randomly selected targets fired at from the center of the line.
- The reason the M16A2 was fired before the SAM-R with the optic was to eliminate the range estimation capability the optic provides taking away any unfair range estimation advantages for the M16A2.
- Conditions for this day were overcast, humid with intermittent heavy rain showers with an average temperature of approximately 85º Fahrenheit.
- Upon completion of shooting this string of fire three times, we transitioned to a *Combat Stress* shoot.
  - This shoot introduced Marines to shooting with optics after getting their heart rate up and creating an environment in which the application of the fundamentals of breath and trigger control as well as range estimation would come into play.
- Course of fire was set up in two lanes.
  - Marines started with twenty 2-count push ups done with a condition three weapon with a magazine inserted but no round in the chamber.
  - They then ran approximately 300 yards to a point were they were instructed to either go to a set of barricades on line to the left of center range or to the right of center range.
  - Marines were instructed to make a condition one weapon with magazine inserted and a round in the chamber when they safely reached their first barricade.
  - This barricade was a low wooded barricade that forced the shooter to take cover and attempt to engage the targets called out by the safety NCO.
  - The Marine attempted to engage the targets.
  - Upon successful engagement, Marines moved to his next barricade.
  - The second barricade forced the shooter to take cover and use the kneeling position. He was again instructed to attempt to engage targets called out by the safety NCO.
    - Upon successful engagement Marines moved to their third barricade.
  - At the third barricade, Marines were forced to use the squat position and fire through a loophole cutout in the barricade.
    - Upon successful engagement of targets, Marines moved to the fourth barricade.
  - The fourth barricade forced them to take cover and use the offhand/standing position.
    - Upon completion the Marines were ordered to make a complete safe weapon on move off the range to the start point.

- The recorder for each lane recorded first and second round hits/misses for each target.
- The Marines did this course of fire twice.
  - Right-handed shooters were forced to shoot from the left side of the barricades on the fourth barricade—and left-handers did the opposite.
  - This posed complications because most shooters had never fired opposite-handed.
- After the combat stress shoot, we concluded with a day unknown distance course of fire with the SAM-R and optic from the prone bipod supported position and a night course of fire with the SAM-R and the AN/PVS-17.
  - The course of fire consisted of 10 targets at ranges from 186 to 432 meters.
  - This was intended to be the day and night unknown distance qualification course of fire but, due to an error in instructor coordination, the shooters were given corrections during the day. It was originally intended that spotter corrections would not be given to the shooters during the qualification course of fire.
  - This is because the SAM concept is not designed as a shooter-spotter pair.

Training Day 8 – 09 October 2002. This course of fire was the sustainment level rifle requalification course that Marines shoot for rifle score.

- This was fired first with the M16A2 with iron sights and then the SAM-R with the optic for a known distance comparison.
- We used Dog targets with 12 inch, 2 point scoring ring for 200 yd line slow fire.

Training Day 9 – 10 October 2002. Same course of fire as T-8.

- Upon completing the sustainment level rifle requalification course of fire, we fired the known distance qualification course of fire.
- Upon completion of the *Day KD* course of fire, we conducted combat drills and multiple target engagements; and then a limited visibility shoot for the second relay.
- The final string of fire was the *Night KD* qualification course of fire with the AN/PVS-17 night optic.

Training Day 10 – 11 October 2002. Unknown distance qualification course of fire with M16A2 with iron sights followed by SAM-R with optic.

- The course of fire was 10 targets at various ranges from 164 to 432 meters.
  - The M16A2 string of fire was fired from the prone with a loop sling.
  - The SAM-R string of fire was fired from the bipod supported prone position.

The Training Schedule as Executed in Guam

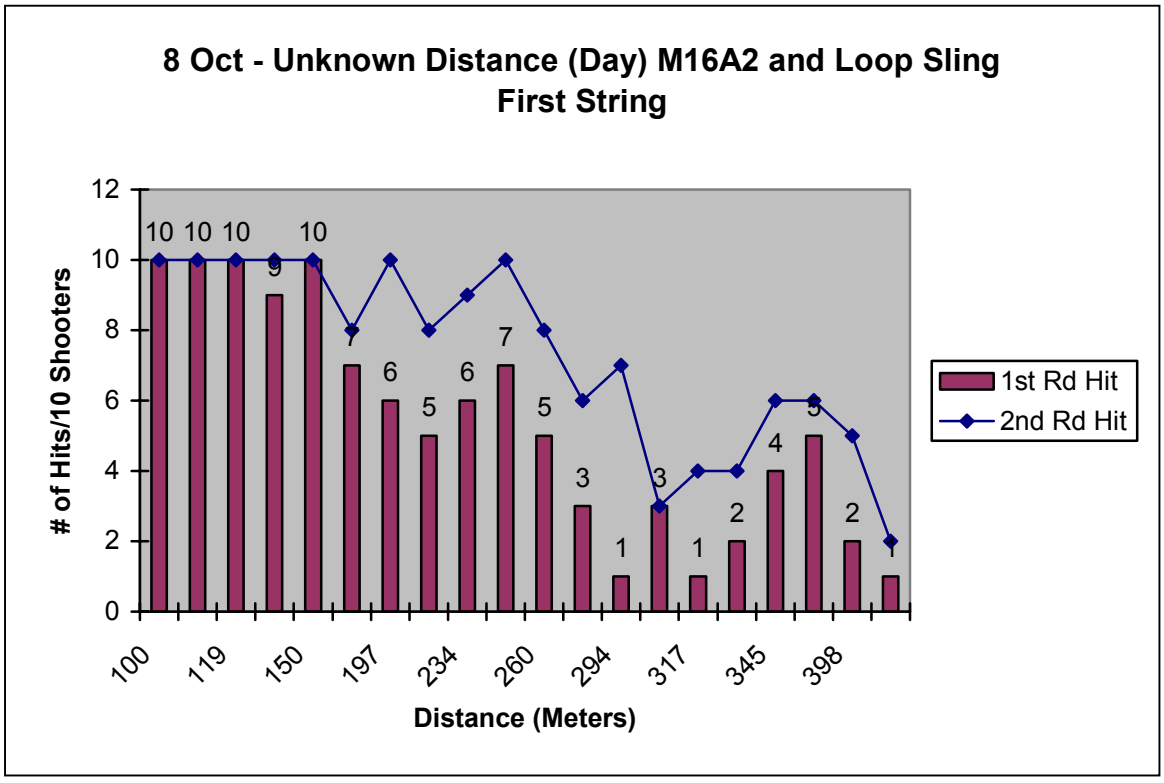
Day/Time	Course Description	Location	Instructor	Remarks
T-1	**Mon 30 Sept 2002**			
0800-0830	Introduction/Mindset of the SAM Course	Class Room	Capt Von	Needed a full day of classes
0830-0900	Rifle and Optics Care and Cleaning	Class Room	GySgt Stone	
0900-1000	Principles Of Shooting	Class Room	GySgt Stone	
1000-1100	Fundamentals Of Marksmanship	Class Room	CSgt Archer	
1000-1030	Introduction to the Advanced Combat Optical Gunsight	Class Room	MSgt Elder	
1200-1300	Chow	Chow Hall	Class Cmdr	
1300-1400	Combat Shooting Positions/ Use Of Support	Orote Pt Range	CSgt Archer	
1400-1600	Snap in M16A2	AAFB Range	MSgt Elder	
T-2	**Tue 1 Oct 2002**			
0830-1300	Zero SAM w/ Optic / Confirm Zero to 500 Yd Line	Orote Pt Range	MSgt Elder	Zero took a long time
1300-1700	Drill Card #1 Relay #2	Orote Pt Range	MSgt Elder	Weak marksmanship skills; needed a lot of individual instruction on glass.
T-3	**Wed 2 Oct 2002**			
0800-1000	Drill Card # 1 Relay# 1	Orote Pt Range	MSgt Elder	Shooters seemed to grasp shooting w/glass
1030-1230	Drill Card # 1 Relay# 2	Orote Pt Range	MSgt Elder	Much better day of shooting
1230-1430	Drill Card #1 Relay #1	Orote Pt Range	MSgt Elder	
1430-1515	Movers/Stop & Go/Bobbers 100yd Prone Relay 1	Orote Pt Range	MSgt Elder	
1515-1600	Movers/Stop & Go/Bobbers 200yd Prone Relay 1	Orote Pt Range	MSgt Elder	Used 12 inch bull's-eye targets
1600-1645	Movers/Stop & Go/Bobbers 100yd Prone Relay 2	Orote Pt Range	MSgt Elder	
1645-1730	Movers/Stop & Go/Bobbers 200yd Prone Relay 2	Orote Pt Range	MSgt Elder	
T-4	**Thu 3 Oct 2002**			

Day/Time	Course Description	Location	Instructor	Remarks
0800-0930	Drill Card # 1 w/Movers, Stop & Go, Bobbers	Orote Pt Range	MSgt Elder	
1230-1330	Zero AN/PVS-17	Orote Pt Range	MSgt Elder	
1330-1530	Line Drills	Orote Pt Range	MSgt Elder	
1530-1600	Classes: Shooting W/ Limited Viz/At Night	Orote Pt Range	MSgt Archer	
1600-1700	Chow	Orote Pt Range	Class Commander	Good intro to night shooting
1700-2300	Limited Visibility Shoot	Orote Pt Range	MSgt Elder	ACOG Enabled shooters to fire
	Night Drill Card Artificial Illumination	Orote Pt Range	MSgt Elder	On targets unseen w/naked eye
	Night Drill Card AN/PVS-17	Orote Pt Range	MSgt Elder	During periods of darkness
T-5	**Fri 4 Oct 2002**			
1000-1045	Class: Unknown Distance / Range Estimation	AAFB Range	CSgt Archer	Three (3) different unknown distances
1045-1600	Unknown Distance Shoot	AAFB Range	MSgt Elder	Drills. Range Estimation
T-6	**Mon 7 Oct 2002**			
0830-1100	Drill Card #1 With Load Bearing Vest (LBV)	Orote Pt Range	MSgt Elder	Shot dog targets and b mod
1100-1200	Chow			
1200-1300	Mover Drill Card w/ LBV	Orote Pt Range	MSgt Elder	
1300-1400	Stop & Go Drill Card w/ LBV			
1400-1500	Bobber Drill Card w/ LBV	Orote Pt Range	MSgt Elder	
1500-1530	Confirm Zero AN/PVS-17	Chow Hall	Class Commander	
1600-1800	Movement to AAFB Range		Class Commander	
1800-2100	Unknown Distance Shoot Night w/ AN/PVS-17	AAFB Range	MSgt Elder	Ammo expenditure to date: 8,000 Rds M855 72 WSP Illum Rds.
T-7	**Tue 8 Oct 2002**			
0800-0900	Unknown Distance Shoot w/ M16A2	AAFB Range	MSgt Elder	
0900-1000	Unknown Distance Shoot W/ Sam-R	AAFB Range	MSgt Elder	

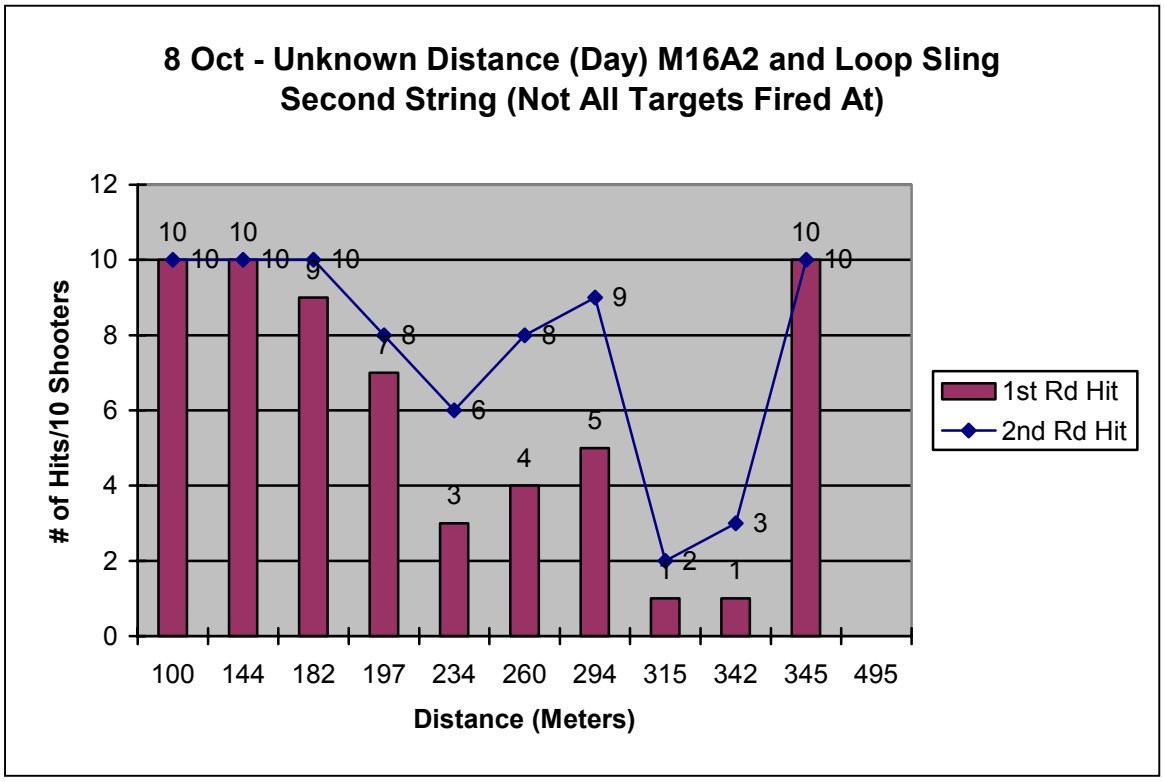
Day/Time	Course Description	Location	Instructor	Remarks
1000-1200	Stress Shoot	AAFB Range	MSgt Elder	
1200-1400	Line Drills	AAFB Range	MSgt Elder	
T-8	**Wed 9 Oct 2002**			
0800-1000	Shooter Evaluation M16A2	Orote Pt Range	MSgt Elder	
1000-1200	Shooter Evaluation SAM-R	Orote Pt Range	MSgt Elder	
1200-1300	Multiple Target Engagement Drills	Orote Pt Range	MSgt Elder	
1300-1500	Chow	Orote Pt Range	Class Commander	
1700-1800	Limited Visibility Shoot Relay #2	Orote Pt Range	MSgt Elder	
T-9	**Thu 10 Oct 2002**			
0800-1100	Qual Course: Day	Orote Pt Range	MSgt Elder	
1100-1300	Chow	Chow Hall	Class Commander	
1300-1400	Line Drills	Orote Pt Range	MSgt Elder	
1400-1500	Multiple Target Engagement	Orote Pt Range	MSgt Elder	
1900-2200	Qual Course: Night	Orote Pt Range	MSgt Elder	
T-10	**Fri 11 Oct 2002**			
0800-1100	Qual Course: Unknown Distance	AAFB Range	MSgt Elder	
1100-1200	Police Ranges	Orote Pt Range	Class Commander	
1200-1300	Chow	Chow Hall	Class Commander	
1300-1400	Clean Weapons	Orote Pt Range	Class Commander	
1400-1500	Gear Turn In	Orote Pt Range	Class Commander	
1500-1600	Course Critiques	Class Room	MSgt Elder	
1600-1700	Final Brief	Class Room	Capt Von	

Annex B – Live Fire Results

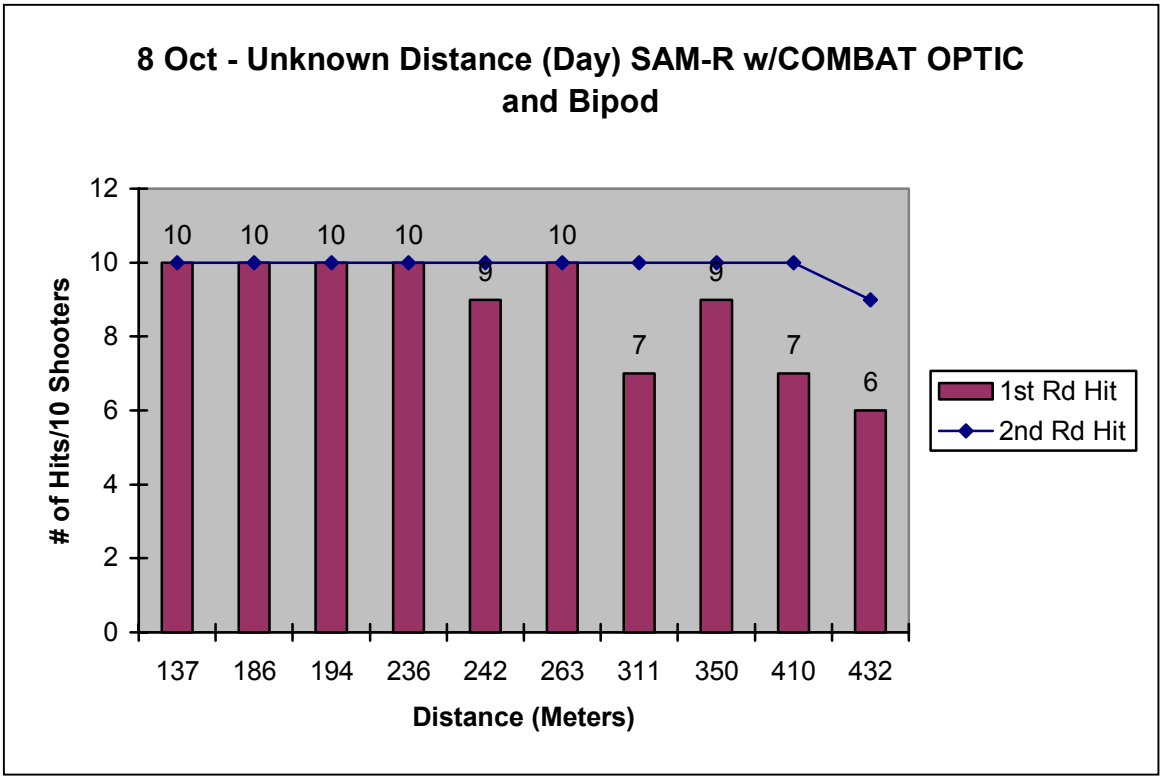
Unknown Distance – 8 Oct																						
Day – M16A2 and Loop Sling – Prone – First String																						
Distance in Meters	**100**	**108**	**119**	**144**	**150**	**182**	**197**	**224**	**234**	**243**	**260**	**260**	**294**	**315**	**317**	**342**	**345**	**389**	**398**	**495**	**#**	**%**
LCPL 1	1	1	1	1	1	1	2	0	1	1	2	2	0	0	0	0	0	0	0	0		
LCPL 2	1	1	1	2	1	1	2	2	0	1	2	2	2	1	0	0	0	0	1	0		
LCPL 3	1	1	1	1	1	0	1	1	2	1	0	1	2	0	0	0	1	2	0	0		
LCPL 4	1	1	1	1	1	0	1	1	2	1	0	0	2	0	2	2	0	0	0	0		
PFC 1	1	1	1	1	1	1	2	2	1	2	10	0	1	0	0	2	2	0	0	0		
LCPL 5	1	1	1	1	1	2	1	1	1	1	2	0	2	0	0	0	0	1	2	0		
LCPL 6	1	1	1	1	1	1	1	1	2	1	1	1	2	0	1	0	1	1	1	0		
SGT 1	1	1	1	1	1	1	1	2	1	1	1	2	0	1	0	0	2	1	2	0		
CPL 1	1	1	1	1	1	1	1	0	1	2	1	0	0	0	2	1	1	1	2	1		
CPL 2	1	1	1	1	1	1	2	1	1	2	1	1	2	0	2	1	1	1	0	2		
Number of 1st Round hits	**10**	**10**	**10**	**9**	**10**	**7**	**6**	**5**	**6**	**7**	**5**	**3**	**1**	**3**	**1**	**2**	**4**	**5**	**2**	**1**	**107**	**54**
Number of 1st or 2nd Round hits	**10**	**10**	**10**	**10**	**10**	**8**	**10**	**8**	**9**	**10**	**8**	**6**	**7**	**3**	**4**	**4**	**6**	**6**	**5**	**2**	**146**	**73**



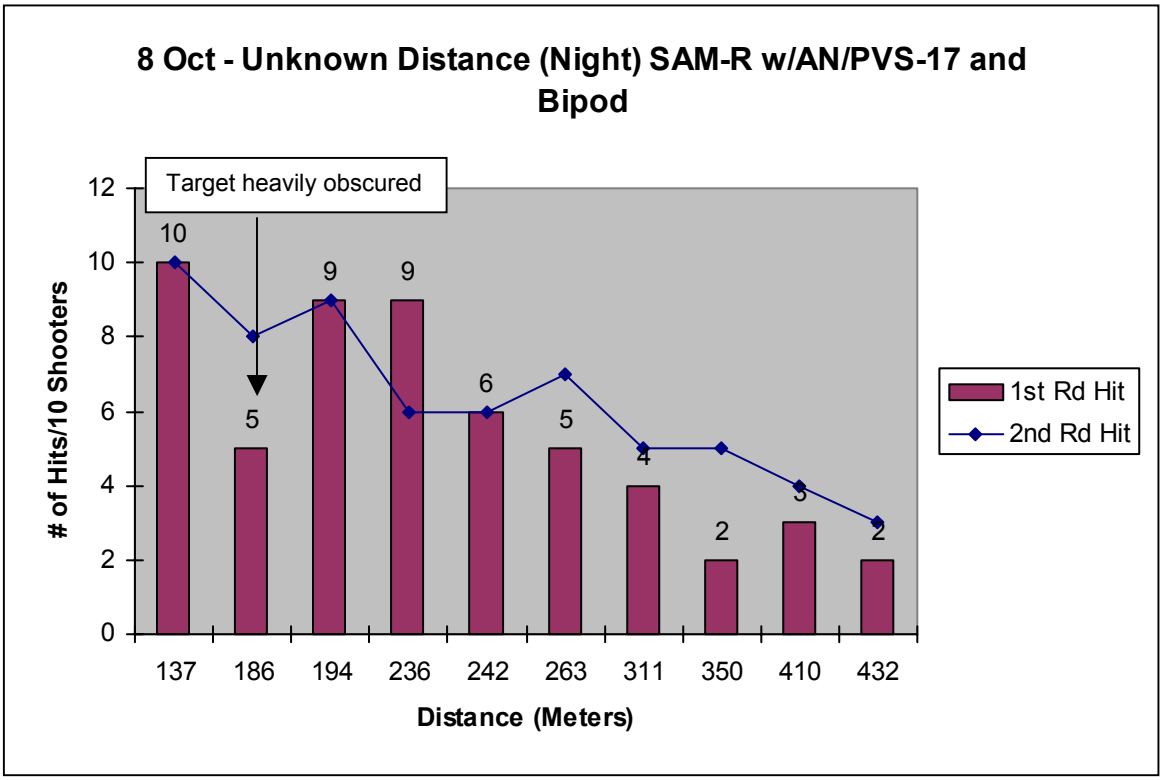
Unknown Distance – 8 Oct																							
Day – M16A2 and Loop Sling – Prone – Second String																							
Distance in Meters	**100**	**108**	**119**	**144**	**150**	**182**	**197**	**224**	**234**	**243**	**260**	**260**	**294**	**315**	**317**	**342**	**345**	**389**	**398**	**495**	**#**	**%**
LCPL 1	1			1		1	1		2		1		2	0		0	1					
LCPL 2	1			1		1	0		0		1		1	0		0	1					
LCPL 3	1			1		2	1		2		0		0	0		0	1					
LCPL 4	1			1		1	0		2		2		2	0		0	1					
PFC 1	1			1		1	2		0		2		2	0		0	1					
LCPL 5	1			1		1	1		0		0		2	0		2	1					
LCPL 6	1			1		1	1		0		2		1	0		0	1					
SGT 1	1			1		1	1		1		2		1	1		1	1					
CPL 1	1			1		1	1		1		1		1	2		2	1					
CPL 2	1			1		1	1		1		1		1	0		0	1					
Number of 1st Round hits	**10**	**0**	**0**	**10**	**0**	**9**	**7**	**0**	**3**	**0**	**4**	**0**	**5**	**1**	**0**	**1**	**10**	**0**	**0**	**0**	**60**	**60**
Number of 1st or 2nd Round hits	**10**	**0**	**0**	**10**	**0**	**10**	**8**	**0**	**6**	**0**	**8**	**0**	**9**	**2**	**0**	**3**	**10**	**0**	**0**	**0**	**76**	**76**

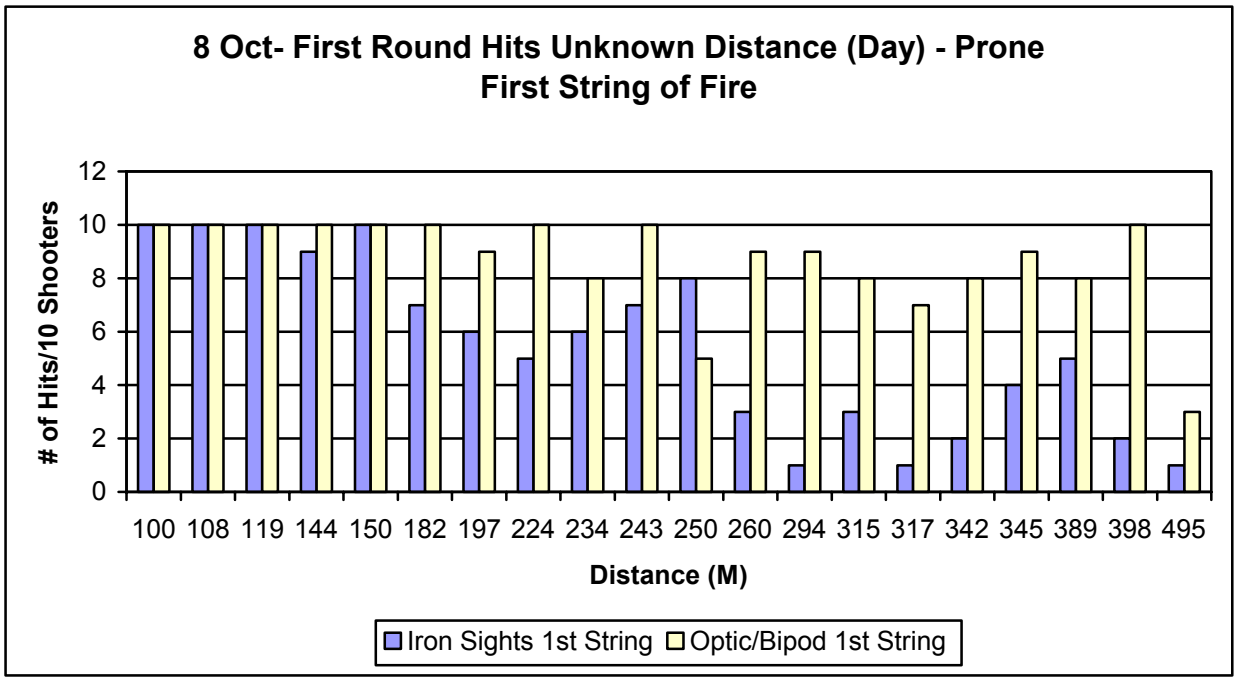


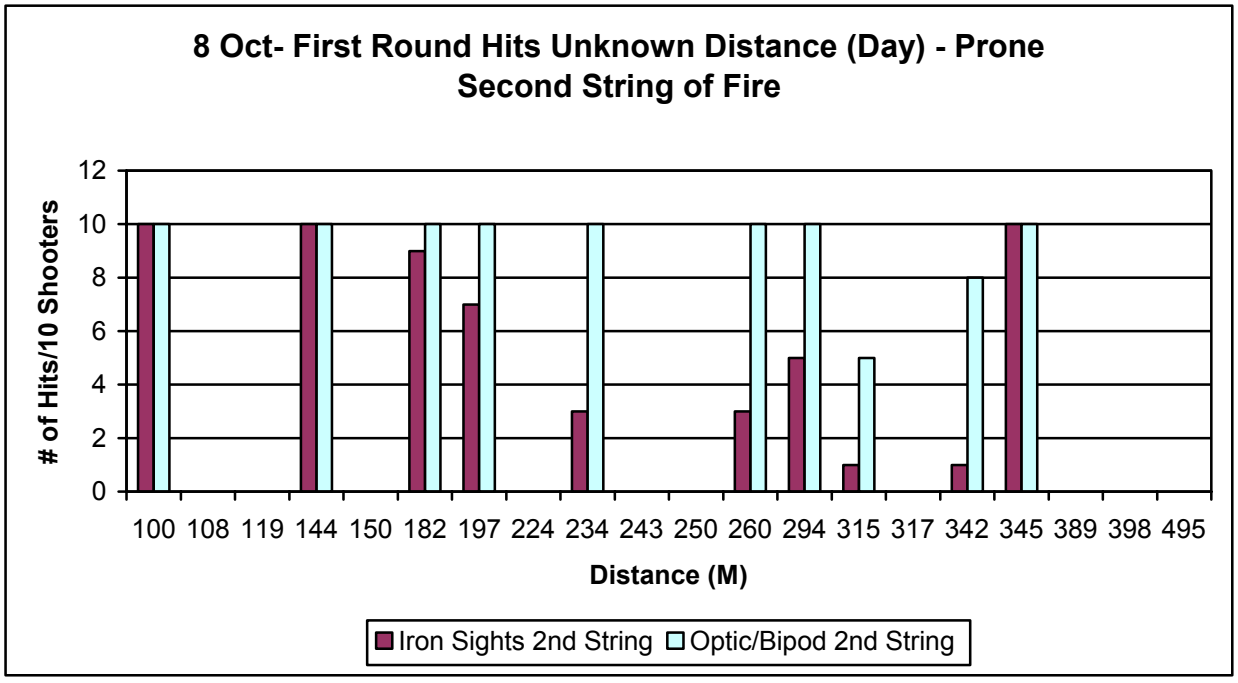
Day and Night Unknown Distance - 8 Oct												
Day - SAM-R w/ COMBAT OPTIC and Bipod												
Distance in Meters	**137**	**186**	**194**	**236**	**242**	**263**	**311**	**350**	**410**	**432**	**#**	**%**
LCPL 1	1	1	1	1	1	1	2	1	1	2		
LCPL 2	1	1	1	1	1	1	1	2	1	1		
LCPL 3	1	1	1	1	1	1	1	1	1	1		
LCPL 4	1	1	1	1	1	1	1	1	1	1		
PFC 1	1	1	1	1	1	1	2	1	2	2		
LCPL 5	1	1	1	1	2	1	1	1	2	1		
LCPL 6	1	1	1	1	1	1	1	1	1	1		
SGT 1	1	1	1	1	1	1	1	1	1	2		
CPL 1	1	1	1	1	1	1	2	1	1	0		
CPL 2	1	1	1	1	1	1	1	1	2	1		
Number of 1st Round hits	**10**	**10**	**10**	**10**	**9**	**10**	**7**	**9**	**7**	**6**	**88**	**88**
Number of 1st or 2nd Round hits	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**9**	**99**	**99**



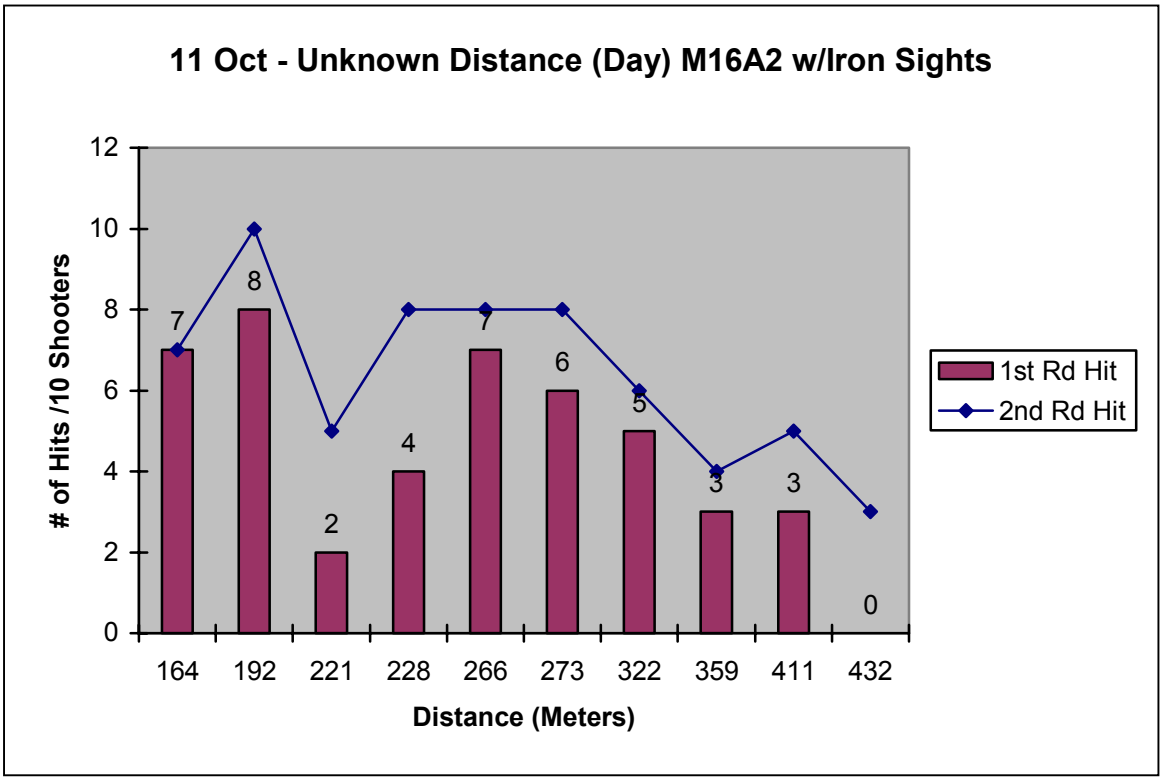
Day and Night Unknown Distance - 8 Oct												
Night - SAM-R w/ AN/PVS-17 and Bipod												
Distance in Meters	**137**	**186**	**194**	**236**	**242**	**263**	**311**	**350**	**410**	**432**	**#**	**%**
LCPL 1	1	2	1	1	1	1	1	2	0	1		
LCPL 2	1	1	1	1	1	1	1	2	1	1		
LCPL 3	1	2	1	2	0	2	0	0	0	0		
LCPL 4	1	1	1	1	0	2	2	0	2	2		
PFC 1	1	0	0	0	0	0	0	0	0	0		
LCPL 5	1	0	1	2	1	1	0	0	0	0		
LCPL 6	1	2	1	1	1	0	0	0	0	0		
SGT 1	1	1	1	2	0	0	0	1	1	0		
CPL 1	1	1	1	1	1	1	1	1	0	0		
CPL 2	1	1	1	1	1	1	1	2	1	0		
Number of 1st Round hits	**10**	**5**	**9**	**6**	**6**	**5**	**4**	**2**	**3**	**2**	**52**	**52**
Number of 1st or 2nd Round hits	**10**	**8**	**9**	**9**	**6**	**7**	**5**	**5**	**4**	**3**	**66**	**66**



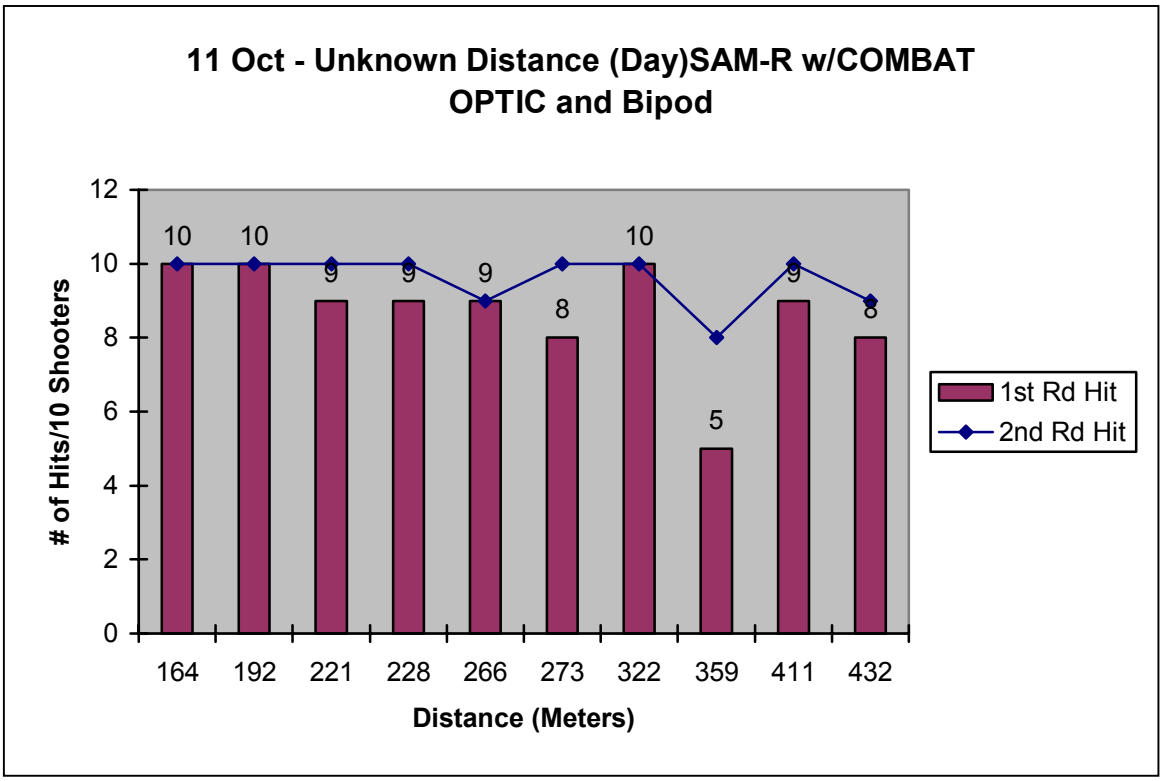

8 Oct- First Round Hits Unknown Distance (Day) - Prone
First String of Fire
# of Hits/10 Shooters
0
2
4
6
8
10
12
100 108 119 144 150 182 197 224 234 243 250 260 294 315 317 342 345 389 398 495
Distance (M)
Iron Sights 1st String
Optic/Bipod 1st String


8 Oct- First Round Hits Unknown Distance (Day) - Prone
Second String of Fire
# of Hits/10 Shooters
0
2
4
6
8
10
12
100 108 119 144 150 182 197 224 234 243 250 260 294 315 317 342 345 389 398 495
Distance (M)
Iron Sights 2nd String
Optic/Bipod 2nd String

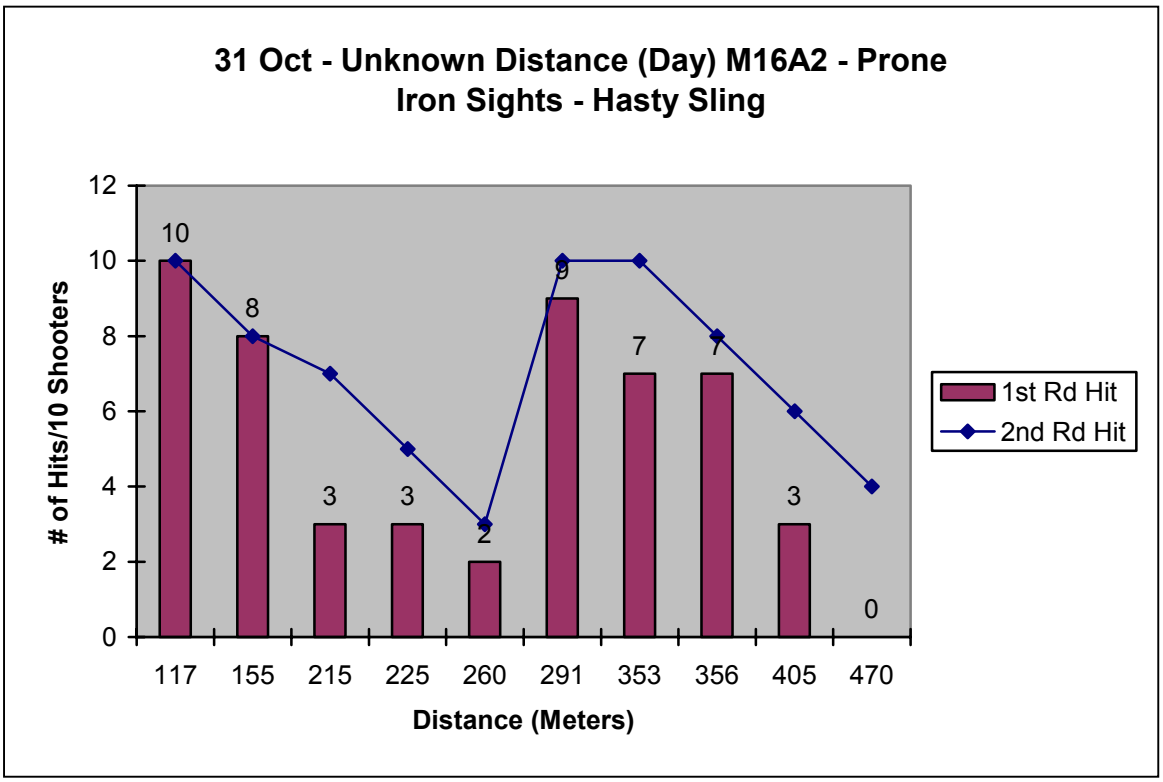
Day Unknown Distance - 11 Oct												
Day - M16A2 w/ Iron Sights												
Distance in Meters	**164**	**192**	**221**	**228**	**266**	**273**	**322**	**359**	**411**	**432**	**#**	**%**
LCPL 1	1	1	0	2	0	1	0	0	0	0		
LCPL 2	1	1	0	0	1	1	2	0	1	2		
LCPL 3	0	1	0	2	1	2	0	0	2	2		
LCPL 4	1	1	2	1	2	2	0	0	0	0		
PFC 1	1	2	1	0	1	1	0	1	0	0		
LCPL 5	1	1	0	1	1	0	1	0	0	0		
LCPL 6	1	1	2	2	1	1	1	2	2	2		
SGT 1	1	1	1	1	1	1	1	1	1	0		
CPL 1	0	2	0	2	1	0	1	0	0	0		
CPL 2	0	1	2	1	0	1	1	1	1	0		
Number of 1st Round hits	**7**	**8**	**2**	**4**	**7**	**6**	**5**	**3**	**3**	**0**	**45**	**45**
Number of 1st or 2nd Round hits	**7**	**10**	**5**	**8**	**8**	**8**	**6**	**4**	**5**	**3**	**64**	**64**



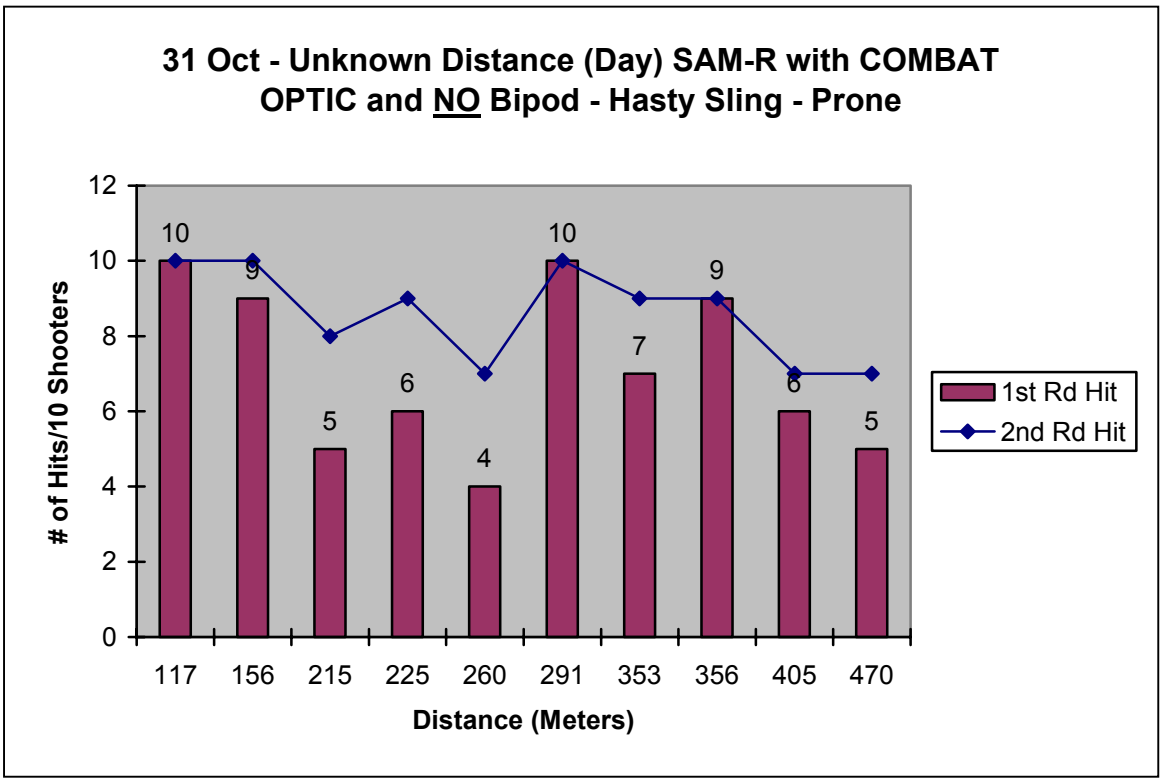
Day Unknown Distance - 11 Oct												
Day - SAM-R w/ COMBAT OPTIC and Bipod												
Distance in Meters	**164**	**192**	**221**	**228**	**266**	**273**	**322**	**359**	**411**	**432**	**#**	**%**
LCPL 1	1	1	1	1	0	1	1	1	1	0		
LCPL 2	1	1	1	1	1	1	1	1	1	1		
LCPL 3	1	1	1	1	1	1	1	0	1	1		
LCPL 4	1	1	1	2	1	1	1	2	1	1		
PFC 1	1	1	1	1	1	2	1	2	1	2		
LCPL 5	1	1	1	1	1	2	1	2	1	1		
LCPL 6	1	1	1	1	1	1	1	1	1	1		
SGT 1	1	1	1	1	1	1	1	1	1	1		
CPL 1	1	1	2	1	1	1	1	0	2	1		
CPL 2	1	1	1	1	1	1	1	1	1	1		
Number of 1st Round hits	**10**	**10**	**9**	**9**	**9**	**8**	**10**	**5**	**9**	**8**	**87**	**87**
Number of 1st or 2nd Round hits	**10**	**10**	**10**	**10**	**9**	**10**	**10**	**8**	**10**	**9**	**96**	**96**



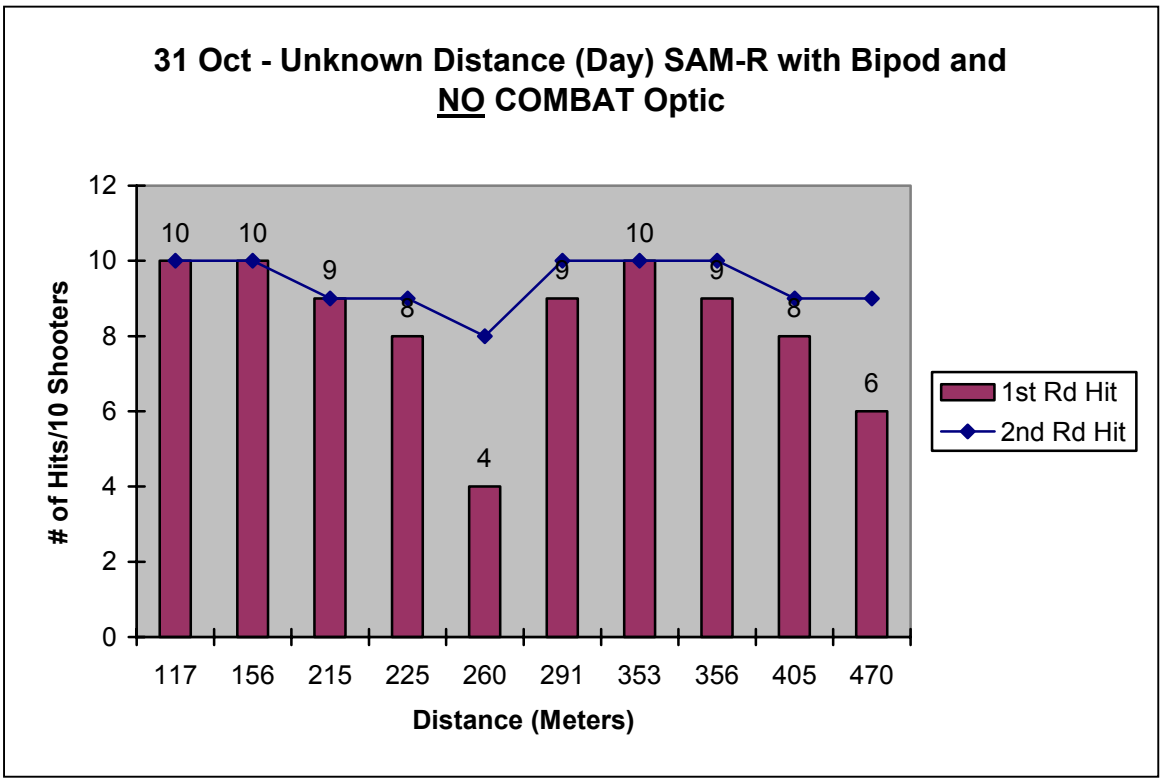
31 Oct Unknown Distance - Day												
M16A2 Prone – Iron Sights – Hasty Sling												
Distance in Meters	**117**	**156**	**215**	**225**	**260**	**291**	**353**	**356**	**405**	**470**	**#**	**%**
LCPL 1	1	1	2	0	0	1	1	1	1	0	6	
LCPL 2	1	0	0	2	0	1	2	0	0	0	2	
LCPL 3	1	0	1	2	0	1	0	0	0	0	3	
LCPL 4	1	2	2	0	0	1	1	1	2	2	4	
PFC 1	1	2	0	0	0	1	1	1	0	2	4	
LCPL 5	1	1	0	0	0	1	1	1	0	0	5	
LCPL 6	1	1	1	1	1	1	1	1	1	0	9	
SGT 1	1	1	1	1	0	1	1	1	1	2	8	
CPL 1	1	1	2	1	2	2	1	1	2	0	5	
CPLl 2	1	1	2	0	1	1	0	2	2	2	4	
Number of 1st Round hits	**10**	**6**	**3**	**3**	**2**	**9**	**7**	**7**	**3**	**0**	**50**	**50**
Number of 1st or 2nd Round hits	**10**	**8**	**7**	**5**	**3**	**10**	**8**	**8**	**6**	**4**	**69**	**69**



31 Oct Unknown Distance - Day												
SAM-R w/COMBAT OPTIC and NO Bipod – Hasty Sling - Prone												
Distance in Meters	**117**	**156**	**215**	**225**	**260**	**291**	**353**	**356**	**405**	**470**	**#**	**%**
LCPL 1	1	1	1	1	2	1	1	1	1	2	8	
LCPL 2	1	1	0	0	0	1	0	0	0	0	3	
LCPL 3	1	1	2	1	0	1	1	1	2	1	7	
LCPL 4	1	1	1	1	1	1	2	1	1	2	8	
PFC 1	1	1	2	1	2	1	1	1	1	0	7	
LCPL 5	1	1	2	2	1	1	1	1	1	1	8	
LCPL 6	1	1	1	2	1	1	1	1	1	1	9	
SGT 1	1	2	1	2	1	1	2	1	0	1	6	
CPL 1	1	1	0	1	2	1	1	1	1	0	7	
CPL 2	1	1	1	1	0	1	1	1	0	1	8	
Number of 1st Round hits	**10**	**9**	**5**	**6**	**4**	**10**	**7**	**9**	**6**	**5**	**71**	**71**
Number of 1st or 2nd Round hits	**10**	**10**	**8**	**9**	**7**	**10**	**9**	**9**	**7**	**7**	**86**	**86**



31 Oct Unknown Distance - Day												
SAM-R with Bipod and NO Combat Optic												
Distance in Meters	**117**	**156**	**215**	**225**	**260**	**291**	**353**	**356**	**405**	**470**	**#**	**%**
LCPL 1	1	1	1	1	2	1	1	1	1	2	8	
LCPL 2	1	1	0	0	0	1	1	2	0	0	4	
LCPL 3	1	1	1	1	1	1	1	1	1	1	10	
LCPL 4	1	1	1	2	1	2	1	1	1	2	7	
PFC 1	1	1	1	1	2	1	1	1	1	1	9	
LCPL 5	1	1	1	1	2	1	1	1	1	1	9	
LCPL 6	1	1	1	1	2	1	1	1	1	1	9	
SGT 1	1	1	1	1	1	1	1	1	1	1	10	
CPL 1	1	1	1	1	1	1	1	1	2	2	8	
CPL 2	1	1	1	1	0	1	1	1	1	1	9	
Number of 1st Round hits	**10**	**10**	**9**	**8**	**4**	**9**	**10**	**9**	**8**	**6**	**83**	
Number of 1st or 2nd Round hits	**10**	**10**	**9**	**9**	**8**	**10**	**10**	**10**	**9**	**9**	**94**	



Summary Chart							
Shooter	**Previous Qualification Score**	**9 Oct M16A2 Iron Sights**	**9 Oct SAM-R w/Optic**	**9 Oct Percent Improve in Crs of Fire (Related to 65 Possible)**	**10 Oct M16A2 w/Iron Sights**	**10 Oct SAM-R w/Optic**	**10 Oct Percent Improve in Crs of Fire (Related to 65 Possible)**
LCpl 1	25	16	37	32%	22	50	43%
LCpl 2	34	19	38	29%	19	52	51%
LCpl 3	41	10	43	51%	19	33	22%
LCpl 4	41	16	38	34%	23	33	15%
Pfc 1	41	15	38	35%	20	43	35%
LCpl 5	42	20	27	11%	29	37	12%
LCpl 6	43	24	49	38%	50	55	8%
Sgt 1	43	40	50	15%	45	49	6%
Cpl 1	47	37	32	-8%	41	48	11%
Cpl 2	51	37	47	15%	42	48	9%
Average	40.8	23.4	39.9	25%	31	44.8	21%

1. Two poorest shooters showed the greatest improvement.
2. All but one shooter (first day) shot better with optic than with iron sights.
3. Greatest improvement seen with less proficient shooters.
4. Data consistent with previous experiments with optics and minimal experience.

Annex C – Shooter Demographics

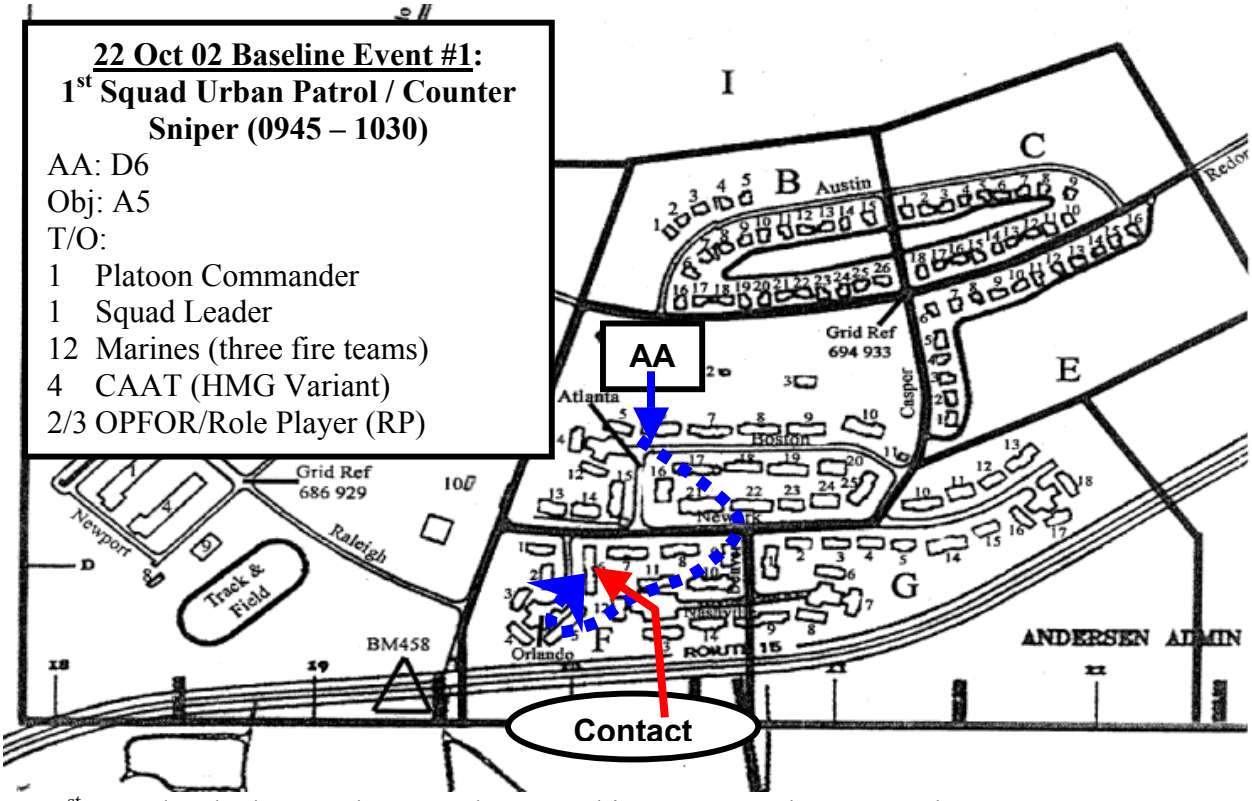
Shooter Demographics											
Age		21	21	19	19	19	20	20	19	20	24
Rank		Cpl	Cpl	LCpl	LCpl	LCpl	LCpl	LCpl	LCpl	Pfc	Sgt
Time in Service		39	39	16	16	15	15	17	16	18	74
MOS		0311	0311	0311	0311	0311	0311	0311	0311	0331	0311 8621
Billet		FT Ldr	FT Ldr	Asst AR	Rifle Man	SAW Gunr	Rifle Man	Rifle Man	Asst AR	MG	Sqd Ldr
Wear Glasses		No	No	No	Yes	Yes	Yes	No	No	No	No
Color Blind		No	Yes	No	No	No	No	No	No	No	No
Recent Qual Score		51	46	46	42	34	26	42	41	41	43
Highest Qual Score		57	46	46	42	34	207	42	41	41	48
Number of Times Qual'd	Ex	3	2	1	1			1	1	1	4
	SS		1	1							
	MM		1		1	2	2	1	1		
Known Distance Course	Day	4	4	2	2	2	2	4	2	2	4
	Night	4	4	2	2	2	2	2	2	1	4
Combat Course	Day		Many	10	10	10	10	3	10	1	7
	Night		Many	10	10	10	10	2	10	1	7
SLAM Course	Day									1	2
	Night									1	2
Moving Target	Day	5	Many	2	1	10	2	3	2	1	5
	Night	5	Many	1	1	5	2	1	1	1	5
Other Courses or Shooting Experience		Marks-manship Coach	None	Hunt	None	CAX	None	None	None	None	CAX
Ever Fired with an Optic		No	No	Yes	Twice	No	No	No	Yes	No	No

Annex D – Proposed SAM Live Fire Training

Day/Time	Course Description	Location	Instructor	Ammo	Remarks
T-1	**Mon/**				
	Intro/Marksmanship Quiz				
	BZO/Grouping				
	Shooter Eval				W/200yd Spotters
	Theory Of Small Arms				
	Shot Process				
	Effects Of Weather				
	Optic				
	Shooting Positions				Snap In/Scope Adj
T-2	**Tue/**				
	Drill Card #1				W/Coaching Time
	Drill Card #1				
	Movers Class				
	Mover Drill Card				W/Coaching Time
	Limited Viz				
	Night: Artificial Illum				
T-3	**Wed/**				
	Data Book Review				
	Drill Card #2				
	Tgt Aqu/Eng Class				
	Combat Drills				
	Drill Card #2				
	Limited Viz(2nd Relay)				
	Night: PVS-17				
T-4	**Thur/**				
	Data Book Review				W/Coaching Time
	Drill Card#2				10 Tgts
	Unknown Dist Class				Multi Tgt
	Unknown Dist DC				Night
T-5	**Fri/**				Use Of Cover
	Pop Up Tgt Rng (UD)				Cover W/Support
	Stress Course				
T-5 (Alt)	**Fri/**				Steel Tgts
	Unknown Dist Course				Use Of Cover
	Stress Course				Cover W/Support
T-6	**Sat/**				
	Qual Course				
	Clean Weapons				
	Course Critiques/Final Review				

Annex E – Event Descriptions

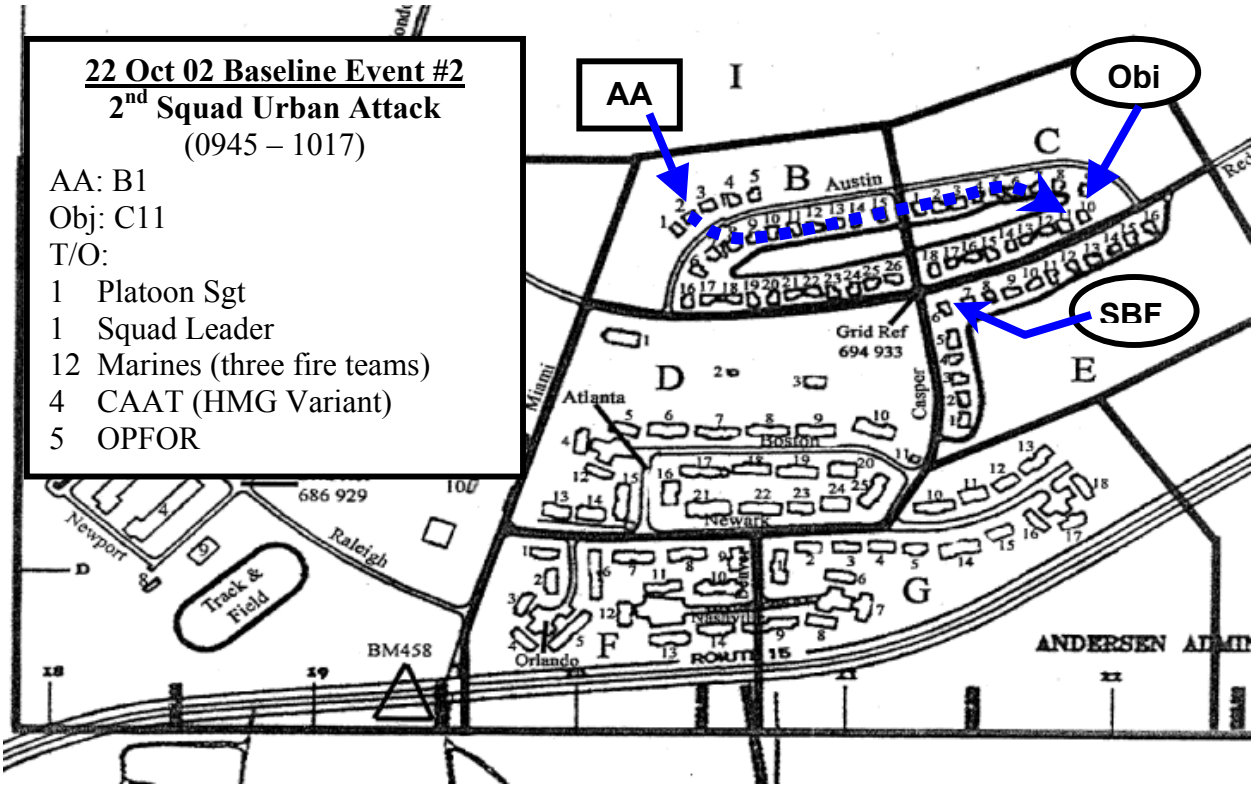
Description of Events:



- 1st Squad tasked to conduct an urban patrol in areas D and F. Route shown on map.
- Contact Point (CP F6) defended by 2 OPFOR snipers. CP not reinforced.
- Combined Antiarmor Team (CAAT tasked to provide overwatch for movement.
- Platoon commander and squad leader controlled squad's movement along route.
- Shortly after departure from friendly lines, the lead elements see three (3) role players (RPs) near D22, (along Newark) and report to PC. No weapons are visible. PC orders to bypass.
- Shots reported from lead fire team (FT) from east side of F6.
  - Squad attempts to isolate F6.
- Stationary base of fire (SBF) on rooftop of F5 kills both snipers; CAAT suppresses the CP after snipers are killed.
- BLUEFOR has 1 KIA. Marine was in an open area against a sniper in an elevated position.

Overall Comments:

- Movement from AA along route was done well.
  - FTs bounded and provided each other over watch.
  - Comm with CAAT was difficult.
  - There was a lack of a *"No-Comm"* plan.
- In several instances, the squad used scrub brush as concealment, which does not provide adequate cover.
- Inadequate attempt at isolating F6.
- CAAT did good recon of their position that aided their SA: but, did not report to higher.
- Squad had several problems with navigation, and gave incorrect *Posreps*.

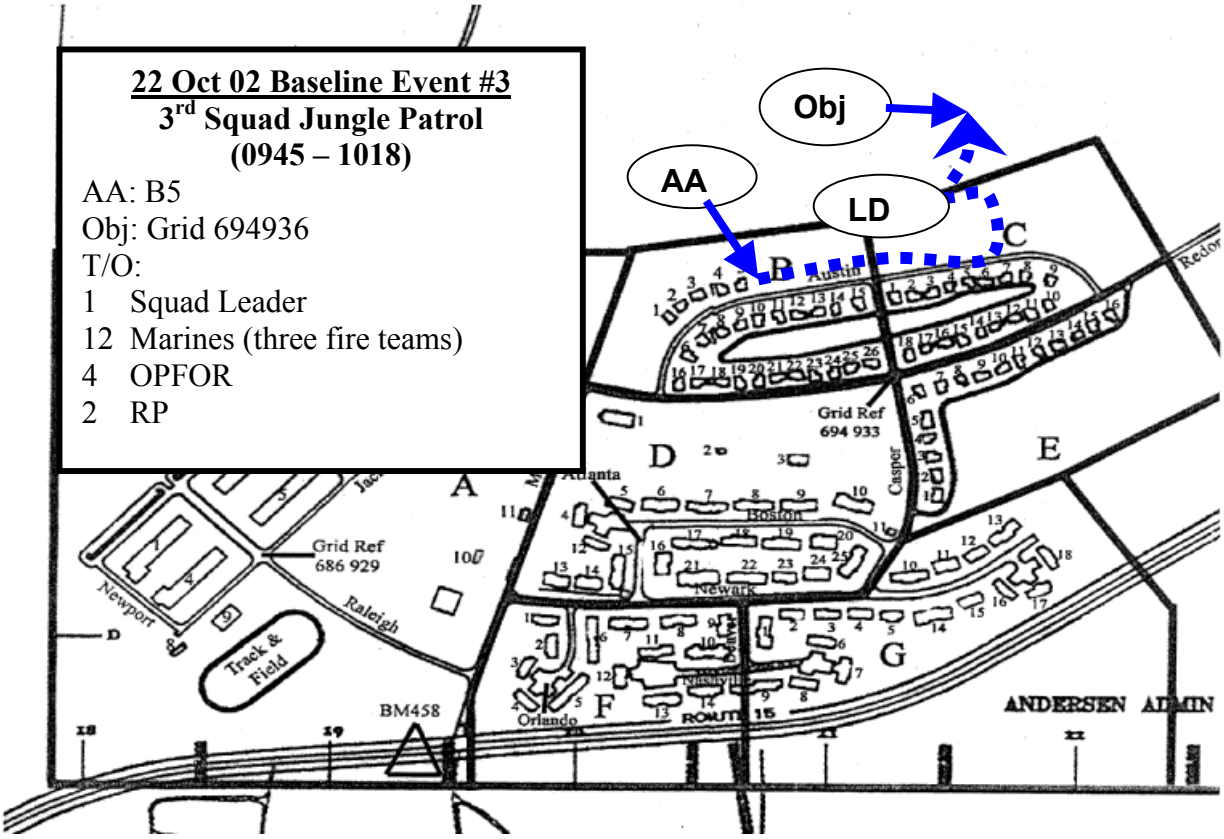


Description of Events:

- 2nd Squad tasked to conduct urban attack on C11 defended by 4 OPFOR.
  - Objective was lightly reinforced.
- At 0945, the squad departs for their assault position at C5/6.
- CAAT tasked to provide SBF position between E6 and E7.
- Platoon sergeant controlled the squad's movement to the objective.
- Once the SBF was in position, the assault element moved towards the objective from the assault position.
- Platoon sergeant was killed moving out of the assault position.
- Shortly, after entering the objective, assault element calls for support.
- All squad members killed
  - Except squad leader (SL), three riflemen and the CAAT element.
- One (1) OPFOR KIA.

Overall Comments:

- Movement from AA to Assault Position was done well.
- FTs bounded and provided each other overwatch.
- Noise discipline was lacking. Instead of using the available radios, commands were shouted.
- Comm with CAAT was difficult. There was a lack of a *"No-Comm"* plan.
- Smoke was employed to cover the assault element movement to objective
  - Squad did <u>not</u> allow sufficient time for smoke to billow.
- In several instances, the squad used scrub brush as concealment, which does not provide adequate cover.



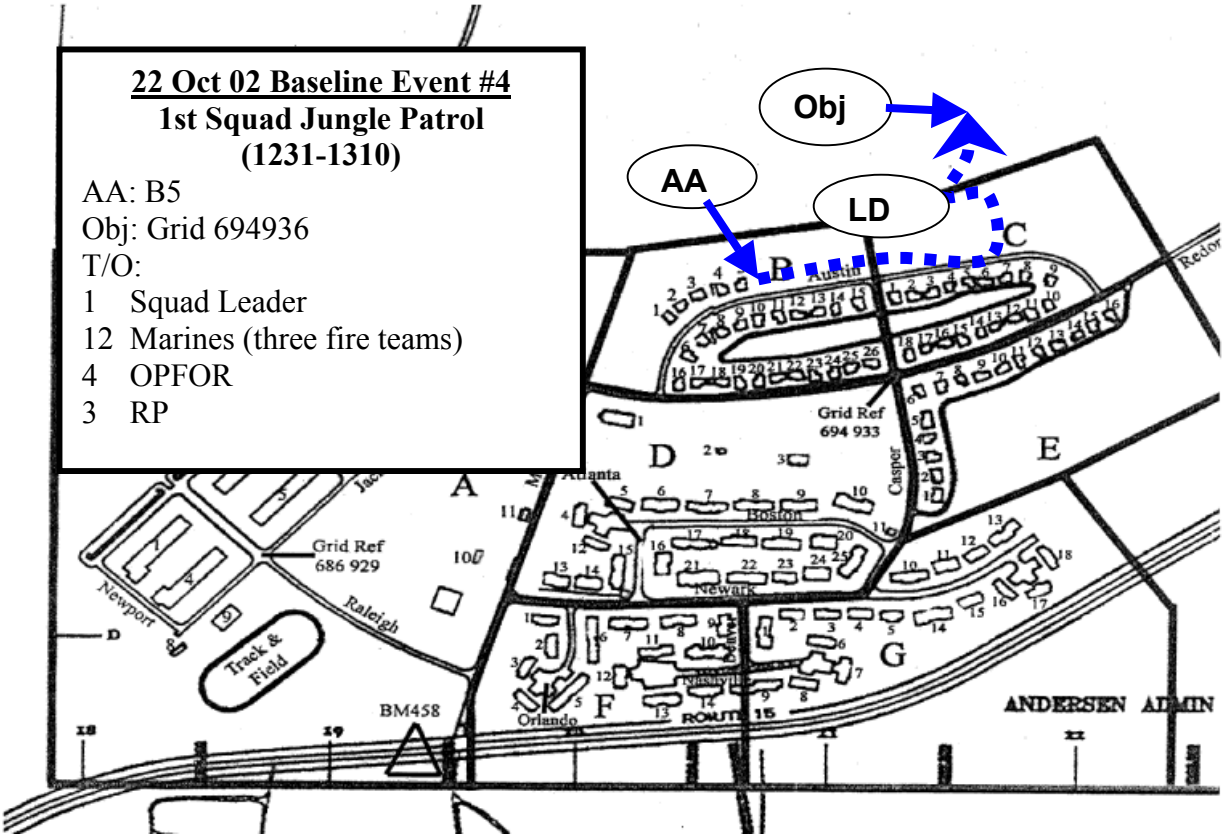
Description of Events:

- 3rd Squad tasked to conduct a jungle patrol (see route overlay above).
- Objective was lightly reinforced.
- At 0945, squad departs their AA (B5).
- Squad leader controlled the squad's movement to the objective.
- Along the route, the squad encountered two civilian hunters.
- Approximately, six minutes later, the squad trips a booby trap and contact is initiated.
- Once the OPFOR were all killed or wounded, squad uses a WSP to signal consolidation.
- BLUFOR suffers eight (8) KIA during the patrol.
- OPFOR suffered 3 KIAs and 1 WIA.

Overall Comments:

- Overall dispersion was poor.
  - Terrain canalized the squad.
- Prep for combat was poor.
  - Marines' gear was not secured properly.
- IA drills were not rehearsed as evidenced by the booby trap scenario.
- Squad did not consolidate past the objective area.

Did not report civilian presence higher or exploit intelligence available from the map that they found.



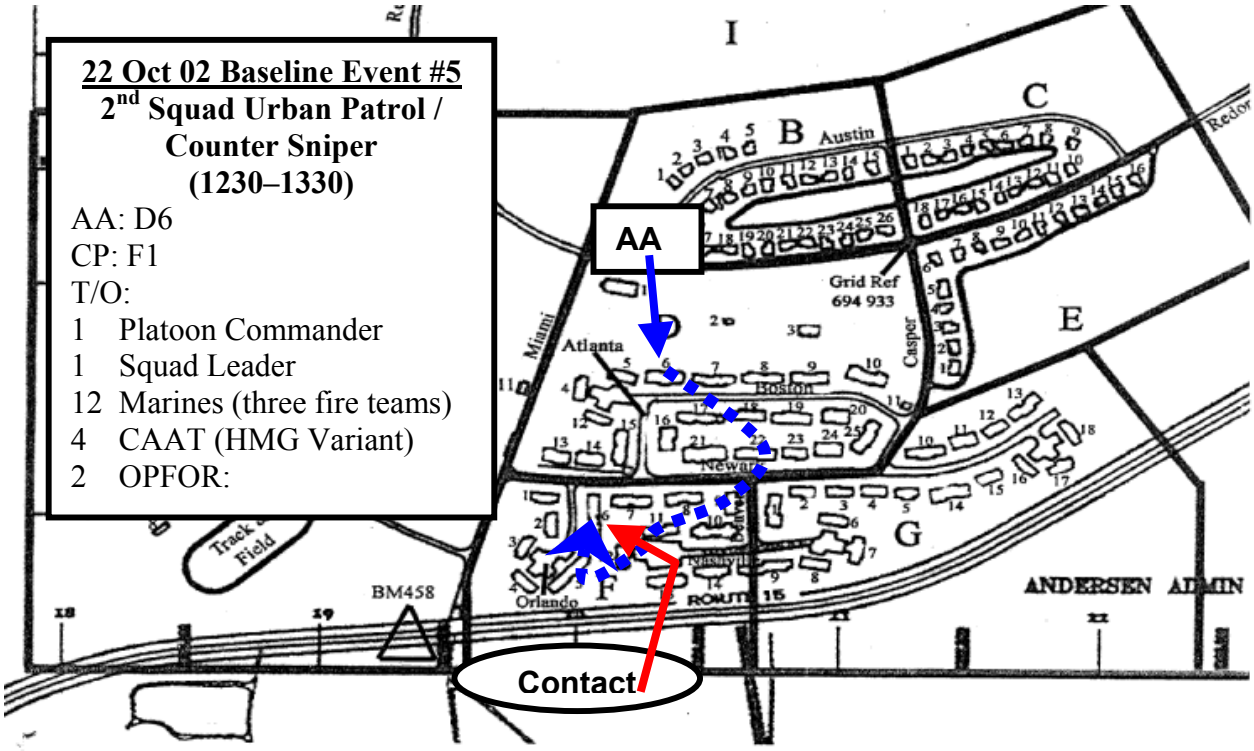
Description of Events:

- 1st Squad tasked to conduct a jungle patrol (see route overlay).
- Objective was lightly reinforced.
- At 1231, squad departs their AA (B5).
- Squad leader controlled squad's movement to the objective.
- Along the route, the squad encountered two civilian hunters.
  - No attempt made to communicate with them.
- Squad's point man trips a booby trap and contact is initiated by the OPFOR sentry.
- Once the OPFOR were all killed or wounded, the squad consolidates approx 10-12 meters past the objective.
- BLUFOR suffers two (2) KIA and two (2) WIA.
- OPFOR suffered four (4) KIA.

Overall Comments:

- Overall dispersion was good during movement.
  - However, the squad became canalized while assaulting the enemy position.
- While searching OPFOR for booby traps, search teams were well exposed to possible frags.
  - There was a lack of security.
- Not much for noise discipline; squad was noisy when moving through the bush.
- Squad did consolidate past the objective area.
- Squad did not attempt to get information from civilians in the area.

Squad did not use cover and concealment to best advantage.



Description of Events:

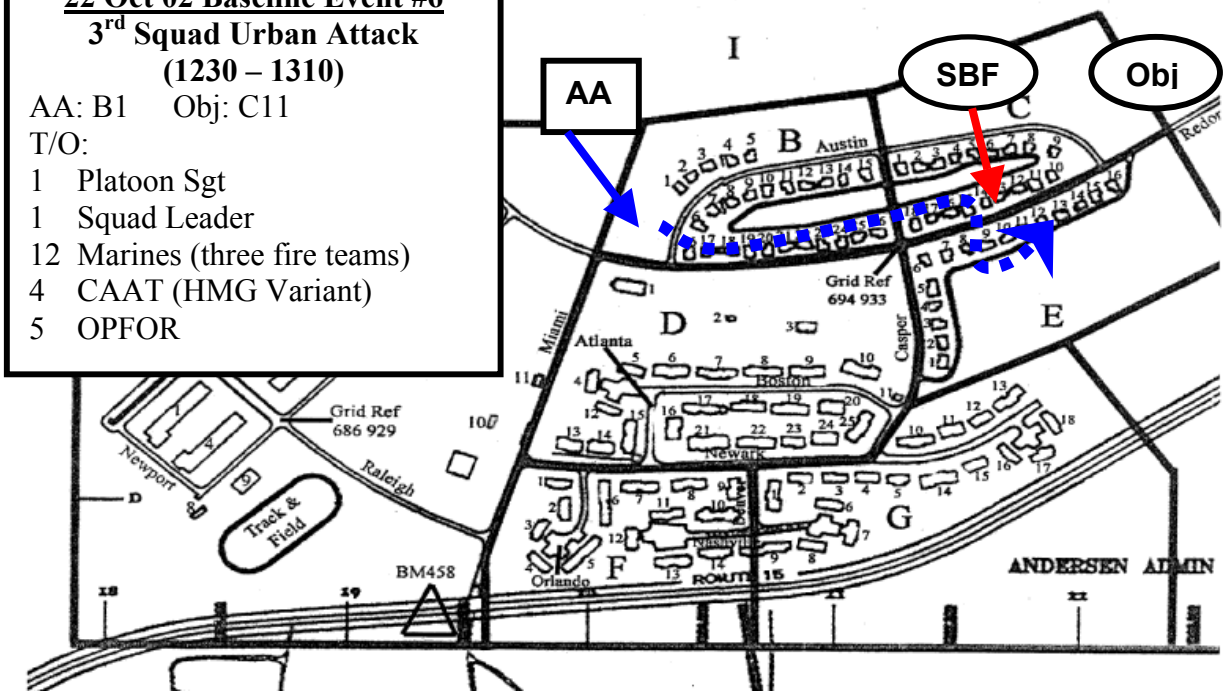
- 2nd Squad tasked to conduct patrol at 1230 in areas D and F along route shown above.
- Contact Point (CP F1) defended by two (2) snipers. CP was not reinforced.
- CAAT provides overwatch—deploys to vic of D22 along Newark (in the middle of the road).
- Sniper shoots CAAT gunner and his replacement. Location of sniper is unknown.
- CAAT, in the open/middle of the street returns fire in the direction of sniper fire (D15).
- Squad has no comm. with CAAT
- Squad maneuvers without knowing yet the direction of fire, and orients N and E.
- Squad begins to move west along route.
- Meanwhile CAAT transports its own casualties back to the AA.
- CAAT returns and gets eyes on the snipers located at F1.
- Squad has maneuvered and isolated CP and clears through building.
- BLUFOR suffers three (3) KIA during building clearing. CAAT has two (2) KIA by sniper.
- Both snipers were killed.

Overall Comments:

- Movement along route well done; FTs bounded and provided each other over watch.
- Comm. with CAAT was non-existent. Lacked a *"No-Comm."* plan.
  - CAAT knew the general direction of the snipers but was not reporting.
- Inadequate attempt at isolating F1.
- Squad leader killed attempting to enter the building.
- CAAT stayed out in open (middle of the street)—led to all three of their casualties.
- Squad had several problems with navigation, and reported incorrect posreps.

22 Oct 02 Baseline Event #6
3rd Squad Urban Attack
(1230 – 1310)

AA: B1 Obj: C11
T/O:
1 Platoon Sgt
1 Squad Leader
12 Marines (three fire teams)
4 CAAT (HMG Variant)
5 OPFOR

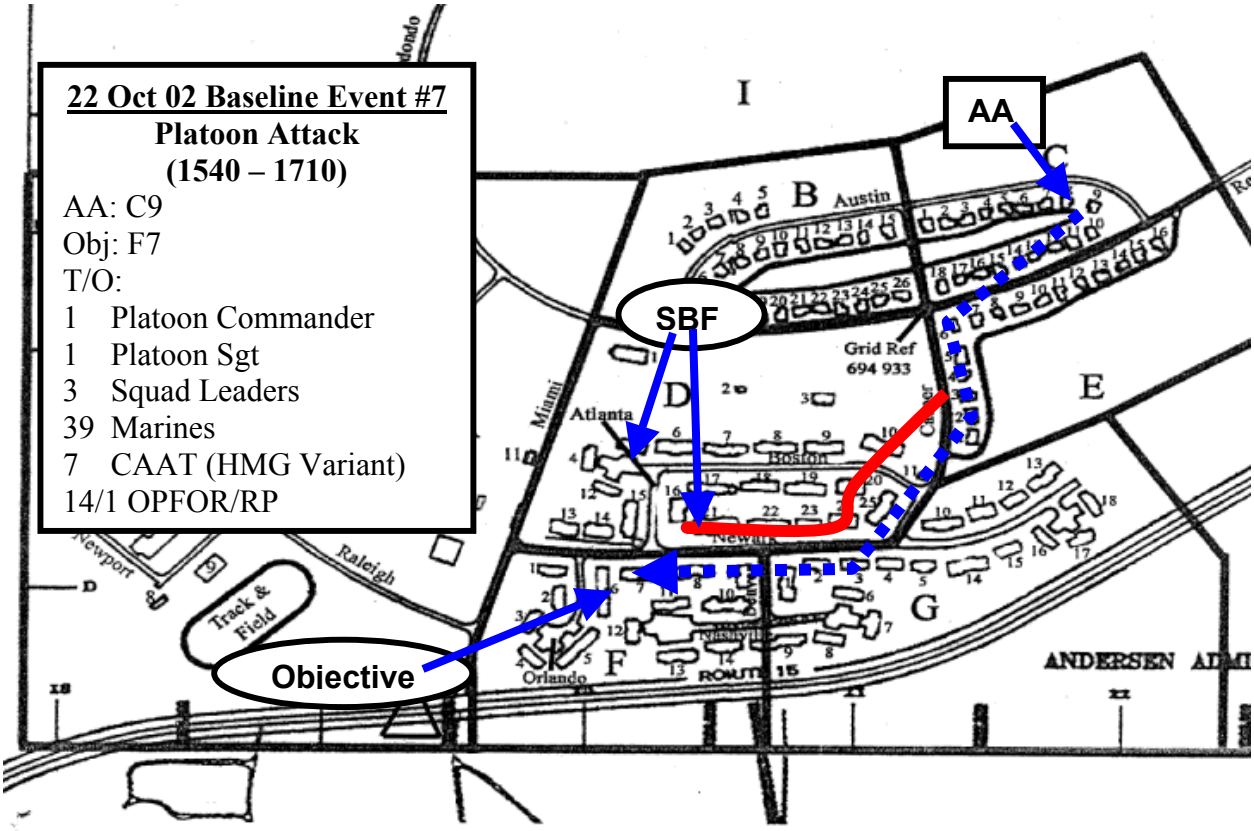


Description of Events:

- 3rd Squad tasked to conduct attack at 1230 on C11 defended by 4 OPFOR.
  - Objective was lightly reinforced.
- CAAT tasked to provide a SBF position between C6 and C7
- Platoon sergeant controlled the squad's movement to the objective.
- Once the SBF was in position, the assault element moved across the open area from mC4 to C15 using the SBF and smoke for cover.
- Once across, the assault element moved towards the objective at C11.
- A support FT moved on to C8 and reports receiving fire from C9.
- Shortly, after entering the objective, the assault element calls for support.
- SBF to displace to C11 in support of assault element, but endex called prior to their arrival.
- Assault element receives 7 casualties (5 KIA, 2 WIA), 4 OPFOR killed.

Overall Comments:

- Movement from AA to assault position was well done. FTs bounded and provided overwatch.
- Better use of communication assets needed.
  - Comm with CAAT was difficult— and lacked *"No-Comm"* plan.
- Smoke/SBF employed to cover assault element movement across open area to south side of C area.
  - Squad did allow sufficient time for smoke to billow.
  - Good use of SBF.
- PL had very good SA.
  - He knew where all his elements were located.
- PL used a runner as a backup for downed comm.; however runner was ineffective.



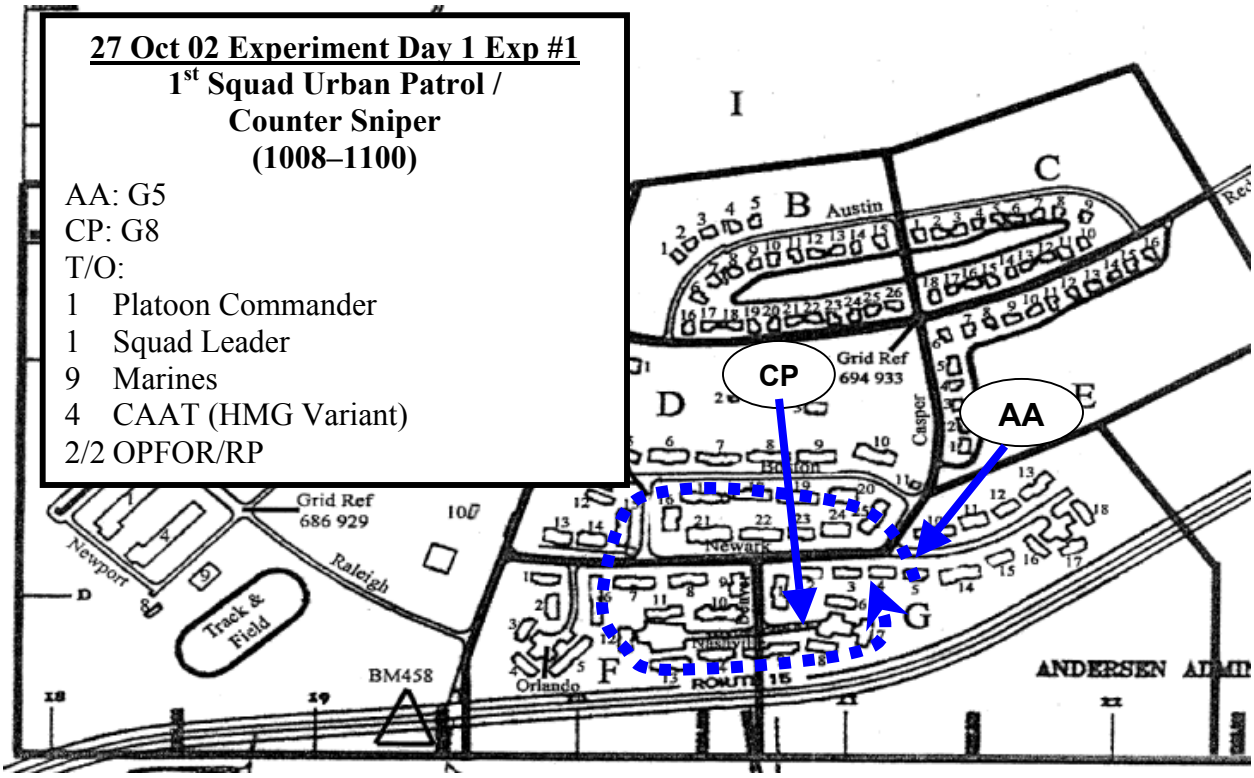
Description of Events:

- Platoon tasked with conducting urban attack on objective building F7.
  - Squad of OPFOR (approx) located there.
- Platoon steps off at 1538 from AA.
- CAAT initially set out to cover movement and then to provide a base of fire from vicinity of D5/6 or D21.
- At E4, platoon sergeant and SBF separate from the remainder of the platoon to D21 (SBF position).
- SBF engages F7/6 with small arms fire as well as 3 AT-4 shots.
- After their supporting fires, SBF is ordered to F8.
- Remainder of platoon moves along route to objective.
- En route to objective, a RP silently counts lead element's numbers and notifies his OPFOR brethren.
- 1st Squad continues to move westerly along the northern edge of F area.
- At their assault position (F8), the SL calls for "breaching equipment up" only to find out that it had been left behind.
- 2nd Squad then enters F7 (top and bottom entry) and begins to clear from one side to the other.
  - 2nd Squad receives numerous casualties during the assault, including some enemy fire from F11.
- CAAT, which was another mobile SBF, was to provide supporting fires from the vicinity of D6 as well as providing a blocking position as the intersection of Newark and Denver.
- CAAT provided fires from a ground-mounted position.

- BLUEFOR suffered fourteen (14) KIA and seven (7) WIA.
- OPFOR had ten (10) casualties.
- There was only 1 RP seen along the route.
  - Unsure as to whether or not he was reported up the chain of command.

Overall Comments:

- Poor bounding and over watch.
- Urban navigation still a problem.
- Teams reporting incorrect position locations.
- Did not leave rear security, which allowed the OPFOR to infiltrate buildings that had already been cleared.
- Platoon had one heat casualty during this event.
- There was a signal plan.
  - Not everyone was aware of it.
  - However, it was effective enough for CAAT and SBF.
- CAAT had a good idea to ground mount the .50cal.
- Link up plan between CAAT and dismounts worked effectively.
- Objective was not effectively isolated.
- Communications were troublesome throughout the attack.



Description of Events:

- 1st Squad tasked to conduct an urban patrol in area D, F, and G.
- At 1008, the squad departs their AA along their prescribed route.
- Along their route, a civilian is spotted in the front yard of D4.
  - SAM is called up to investigate further.
- Further along the route, the SAM reports a civilian between F10 and F14.
  - Platoon commander believes he may be a spotter for a sniper in the area and orders the SAM to scan the areas around the civilian.
- SAM reports that the civilian has a radio and is communicating with someone unknown.
- At 1047, shots are fired from the vicinity of G7.
- CAAT provided supporting fires on the sniper located on the rooftop of G7 and kills him.
- SAM is positioned on G7 rooftop to cover movement of the squad's entry into friendly lines.
- Squad reenters friendly lines with no casualties.
- 1 OPFOR killed, the other sniper escapes and evades.

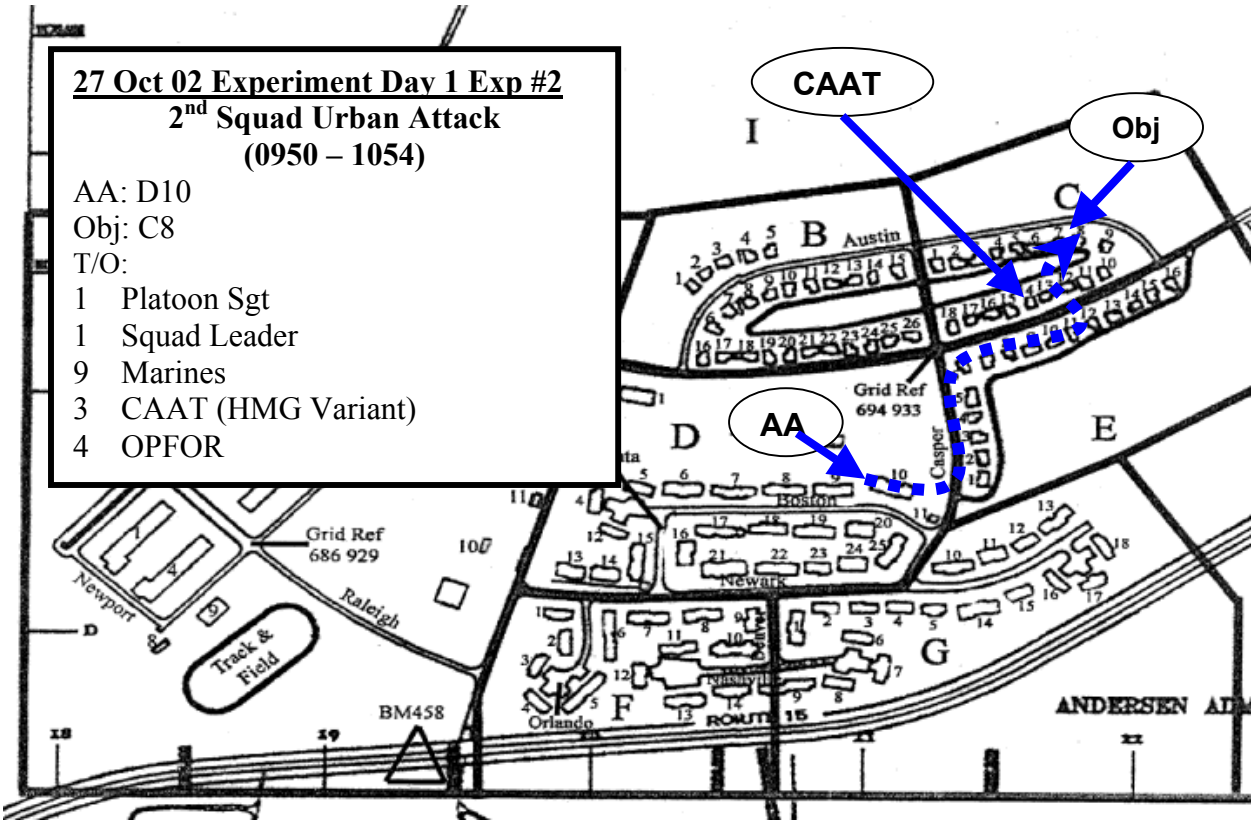
Overall Comments:

- Not all members of patrol notified of patrol route. CAAT asks for the route one minute prior to LD.
- Fire teams bounded and provided each other over watch.
- Good employment of the SAM, especially on rooftops.
- SAM accurately reported disposition of civilian with radio.
- Overall communication was difficult—lacked *"No-Comm"* plan.
- Good use of "Go Firm" because improved PC's situational awareness.
- Platoon commander aware that OPFOR was using civilians as spotters.

SAM Score Card						
Opportunity	**Observed**	**Reported**	**Engaged**	**Hit**	**Loc**	**Remarks**
1. Man with stick outside	Yes	Yes	No		D18	Not initially seen by SAM. Once spotted, SAM was able to confirm that the man had no weapons
2. Man in window with no gear	No	No			D15	Location bypassed by squad
3. 782 gear laying in yard	No	No			F6	Location bypassed by squad
4. Ammo can on roof	No	No			F3	Location bypassed by squad
5. Man with radio/ no weapon	Yes	Yes	No		F9	Took several minutes for SAM to ID that man had a radio
6. Sniper	No	No			F7	Sniper killed one of the SAMs before SAM ID'd him

SAM's Impact.

1. Two (2) SAMs in 1st Squad.
2. Sam accurately reported disposition of civilian via the radio. This alerted the PC that a sniper might be in the area.
3. Provided overwatch and observation for squad's movement.
4. One of the SAMs was KIA while scanning for the sniper.



Description of Events:

- 2nd Squad tasked to conduct attack on C8 defended by 4 OPFOR.
  - Objective was lightly reinforced.
- At 1003, the squad departs for their assault position at C12.
- CAAT tasked to provide SBF position between C14 and C15.
- Squad leader controlled the squad's movement to the objective.
- SAM emplaced on the rooftop of E6 for overwatch and eventually on C13.
- SAM observes wire obstacles and relays orders from SL to the TLs as well as disposition of objective.
- With SBF in position, assault begins—smoke employed to cover their movement.
- Lead fire team attempts to enter the objective.
- Shortly thereafter, the support FT is called.
- Squad enters through a window.
- Squad received six casualties (4 KIA/2 WIA).
- All four OPFOR are KIA/WIA (3/1).

Overall Comments:

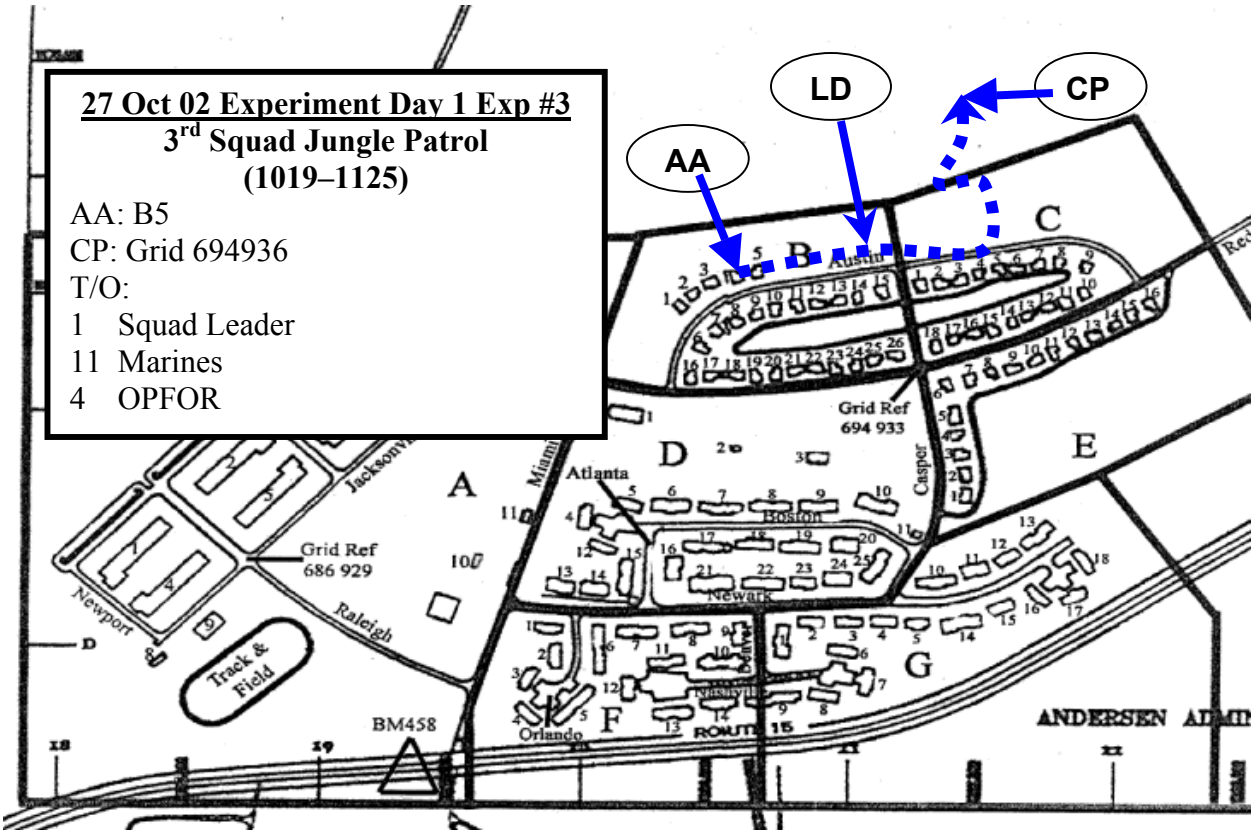
- Movement from AA to assault position was slow and methodical.
- Fire teams bounded and provided each other over watch.
- Good employment of the SAM.
  - SAM reported disposition as well as relayed orders from the SL to TLs.
- Squad made good use of the CAAT vehicle.

  - Besides being the SBF, vehicle was used to emplace the SAM on top of rooftops (because the squad did not bring their ladder).
- Overall communication was difficult—lacked *"No-Comm"* plan.
  - However, the SAM aided in relaying message traffic.
- Smoke employed to cover assault element movement to objective.

SAM Score Card						
Opportunity	**Observed**	**Reported**	**Engaged**	**Hit**	**Location**	**Remarks**
1. Red fire extinguisher	Yes	Yes	No		C17	Spotted (from E6) and passed to SL
2. Wire obstacles.	Yes	Yes	No		C8	SW portion of C8
3. Red box	Yes	Yes	No		C9	
4. Red, white, blue can	No				Vic C7	
5. Green Marker	No				C8	
6. SAW gunner	no					Hidden by shadows inside
7. Runner w/drawer	No					Sent out 1024 - most of squad at C14

SAM's Impact.

1. Identified the wire obstacle around the objective. This enabled the squad leader to adjust the attack accordingly and dictate an assault point.
2. Was able to accurately estimate/determine range to the obstacle using the optic.
3. Provided overwatch and observation for squad's movement.
4. SAM's communication problems made it difficult to pass information from overwatch positions to the squad.



Description of Events:

- 3rd Squad tasked to conduct jungle patrol as shown.
  - At 1019, squad departs AA along their prescribed route.
- SAM emplaced to cover avenues of approach.
- At C6, squad moves north into jungle and begins the patrol route.
- Along the trail, the SAM locates and identifies a cache site with an AT4, MREs, and ammo.
- Lead FT searches the area and the squad leader orders a bypass and continue along route.
- Squad reaches an open area in the jungle. SAM moves forward to observe what seems to be a dead OPFOR.
  - SAM fires on the body to ensure it is not alive.
  - Body is searched, squad then continues along route.
- Enemy movement heard shortly after leaving open area, and squad sets into a 180-degree defense oriented towards the sound.
- Squad identifies several helmets coming their way, but could not distinguish friend or foe.
- SAM correctly identifies the helmets as enemy and kills three (3) OPFOR.
  - SAM used the optic in identification.
  - All bodies were searched.
- No BLUFOR casualties.
- Endex is called after contact.

Overall Comments:

- Squad moved too quickly along their patrol route.

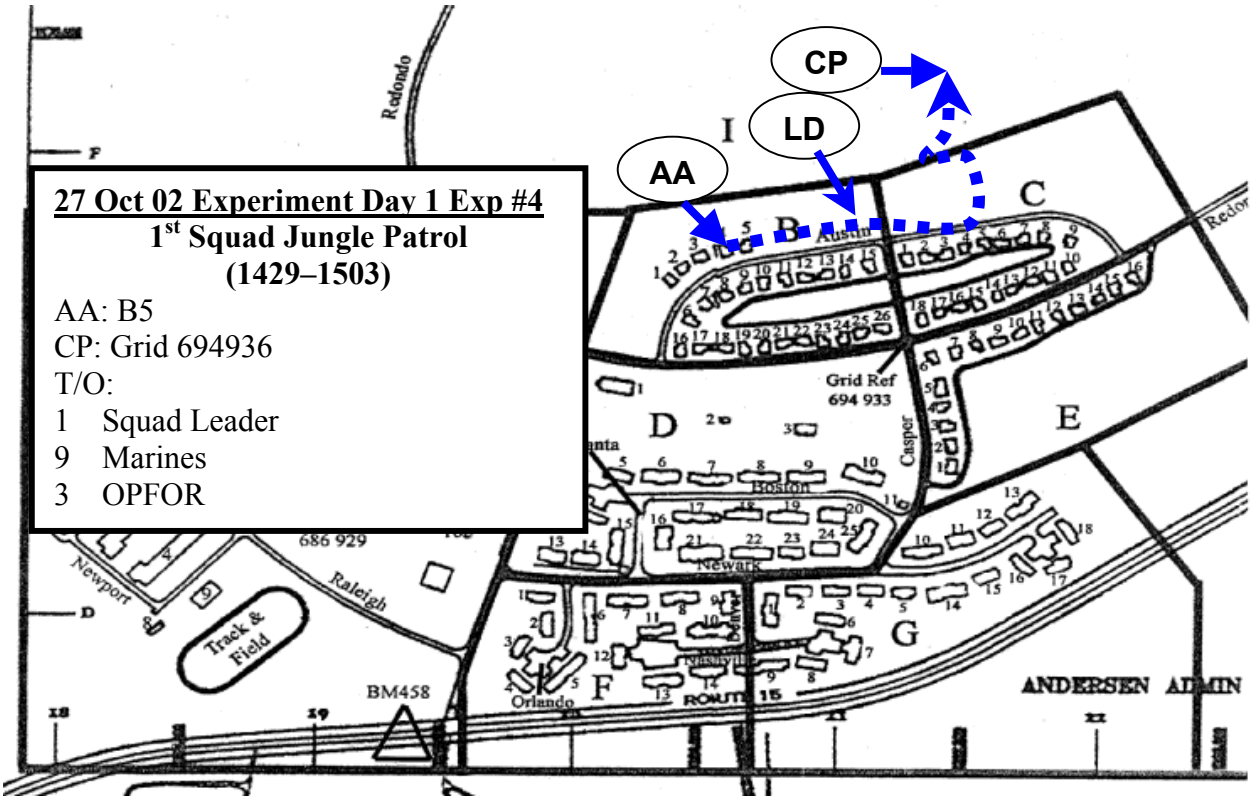
  - Seemed more like a MTC than a patrol.
- Good effort by the SAM.
  - He single handedly identified and killed all the OPFOR.
- Squad leader did not have good control of squad.
  - Good FT leaders compensated for this.
- Poor search techniques of KIA.
  - SOPs need to be established and rehearsed.
- Navigation was easy due to the fact that the route was cut out for them.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Cache site (ammo, MREs and AT-4)	Yes	Yes			50 meters into route	Located and reported by SAM
2. Enemy dead body	No	Yes	Yes	Yes	694936	Point man spots body, SAM reports, SL orders SAM to engage
3. Locate/ ID OPFOR	Yes	Yes	Yes	Yes	694936	SAM located and killed all OPFOR

SAM's Impact.

1. By relaying point man information, SAM enabled squad leader to have better SA.
2. SAM located and identified enemy cache site.
3. Positively identified and successfully engaged OPFOR.
4. SAM killed all the OPFOR and put three rounds into dead OPFOR.



Description of Events:

- 1st Squad tasked to conduct jungle patrol as shown.
- SAM emplaced to cover avenues of approach.
- At C6, squad moves north into the jungle and begins the patrol route.
- Point man and SAM walk past the enemy cache site.
  - Third man in column locates and identifies a cache site with an AT4, MREs, and ammo.
  - Squad bypasses.
- Squad reaches an open area in the jungle.
- SAM moves forward to observe what seems to be a dead OPFOR.
- OPFOR is actually alive but wounded making lots of noises.
- Three enemy move towards their wounded comrade and are identified by the SAM.
  - SAM unsure as to whether they are armed/have weapons.
- Squad moves online and engages.
- Squad assaults through and consolidates and conducts a box recon of the immediate area.
  - Dead OPFOR are searched
  - BLUFOR KIA moved to a CCP.
- Squad pops smoke and withdraws.
- Endex is called after contact.
- Two BLUFOR KIA.
- Three OPFOR KIA.

Overall Comments:

- Squad moved too quickly along their patrol route—more like a movement to contact (MTC) than a patrol.

- Due to their rapid movement, SAM and point man overlooked the enemy cache site.
- When the wounded OPFOR was heard and OPFOR was identified moving into the area, squad was indecisive as to what to do.
- Search techniques of KIA were poor.
  - SOPs need to be established and rehearsed.
- Navigation was easy due to the fact that the route was cut out for them.
- Good use of a signal plan to cover their withdrawal.

SAM Score Card

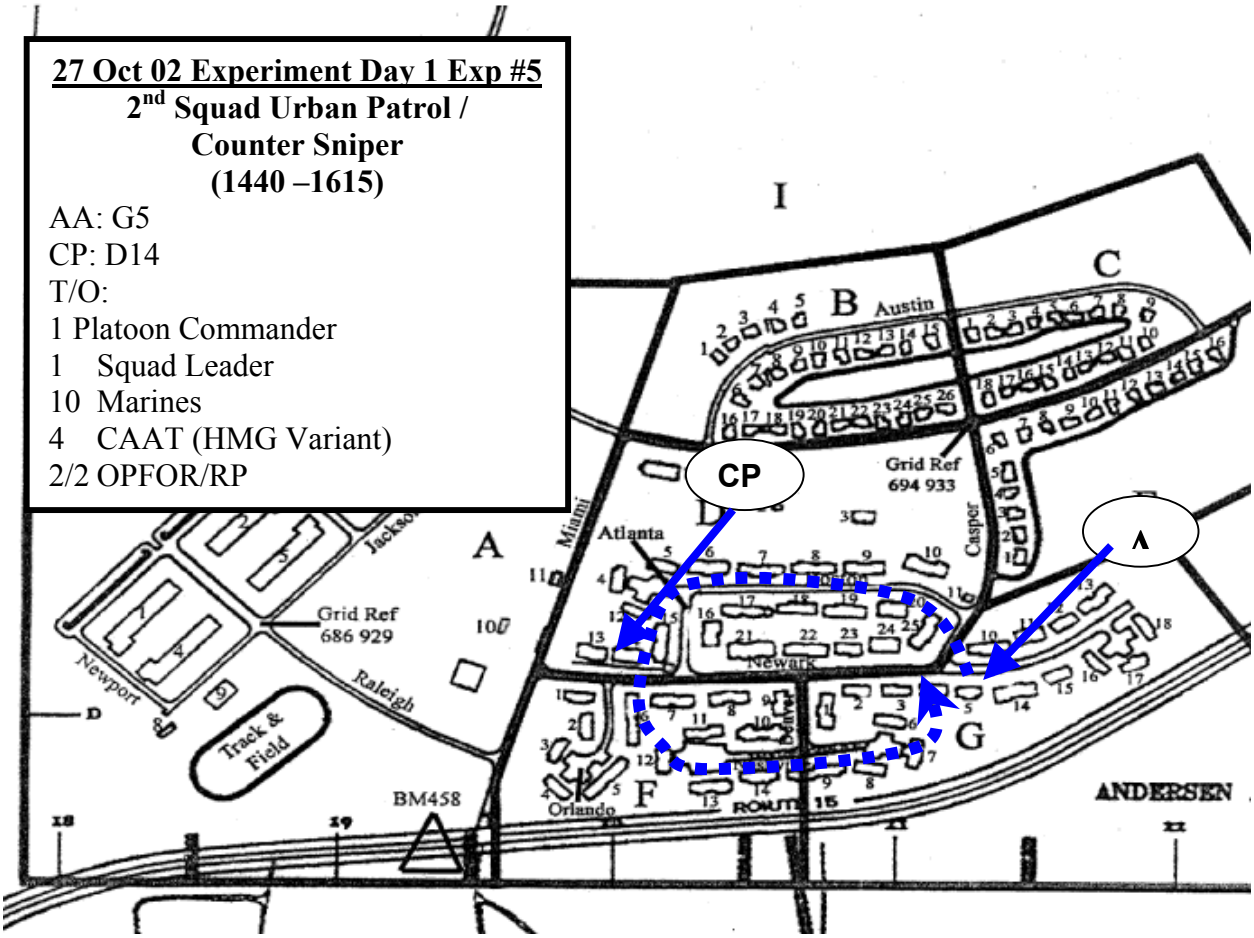
Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Cache site (ammo, MREs and AT-4)	No				50 meters into patrol	Observed and reported by 2nd FT. SAM did not see it
2. Wounded enemy	Yes	Yes	No		694936	SAM located and reported could not confirm a weapon. SL told SAM not to engage. He made too much noise when alerting the squad
3. Locate OPFOR	Yes	Yes	No		694936	SAM located and reported enemy but could not confirm weapons. SL told SAM not to engage unless he could confirm they had weapons

SAM's Impact.

- Movement too fast. Caused SAM to miss cache site.
- Searching techniques were done too rapidly.
- SAM enabled SL to know size of enemy force approaching.
- SAM assumed normal rifleman responsibilities upon contact.

27 Oct 02 Experiment Day 1 Exp #5
2nd Squad Urban Patrol / Counter Sniper
(1440 –1615)

AA: G5
CP: D14
T/O:
1 Platoon Commander
1 Squad Leader
10 Marines
4 CAAT (HMG Variant)
2/2 OPFOR/RP



Description of Events:

- 2nd Squad tasked to conduct an urban patrol in area D, F, and G.
- Along the route shown on the map, a civilian is spotted in the front yard of D4.
  - SAM is called up to investigate further.
  - SAM reports that civilian is no threat.
- Further along the route, squad member reports what seems to be a body on the rooftop of D15.
  - SAM is moved to D15 to investigate.
  - SAM does not report anything pertaining to this.
- SAM reports a civilian with a radio at F11.
- Platoon commander believes he may be a spotter for a sniper in the area and orders the SAM to scan the areas around the civilian.
- SAM reports that the civilian has a radio and is communicating with someone unknown.
- A sniper at D14 fires at squad and kills SAM.
- Squad returns fire and kills the sniper.
- The squad then enters D14 and clears it.
- Squad re-enters friendly lines with one casualty (SAM).
- One (1) OPFOR is killed.

Overall Comments:

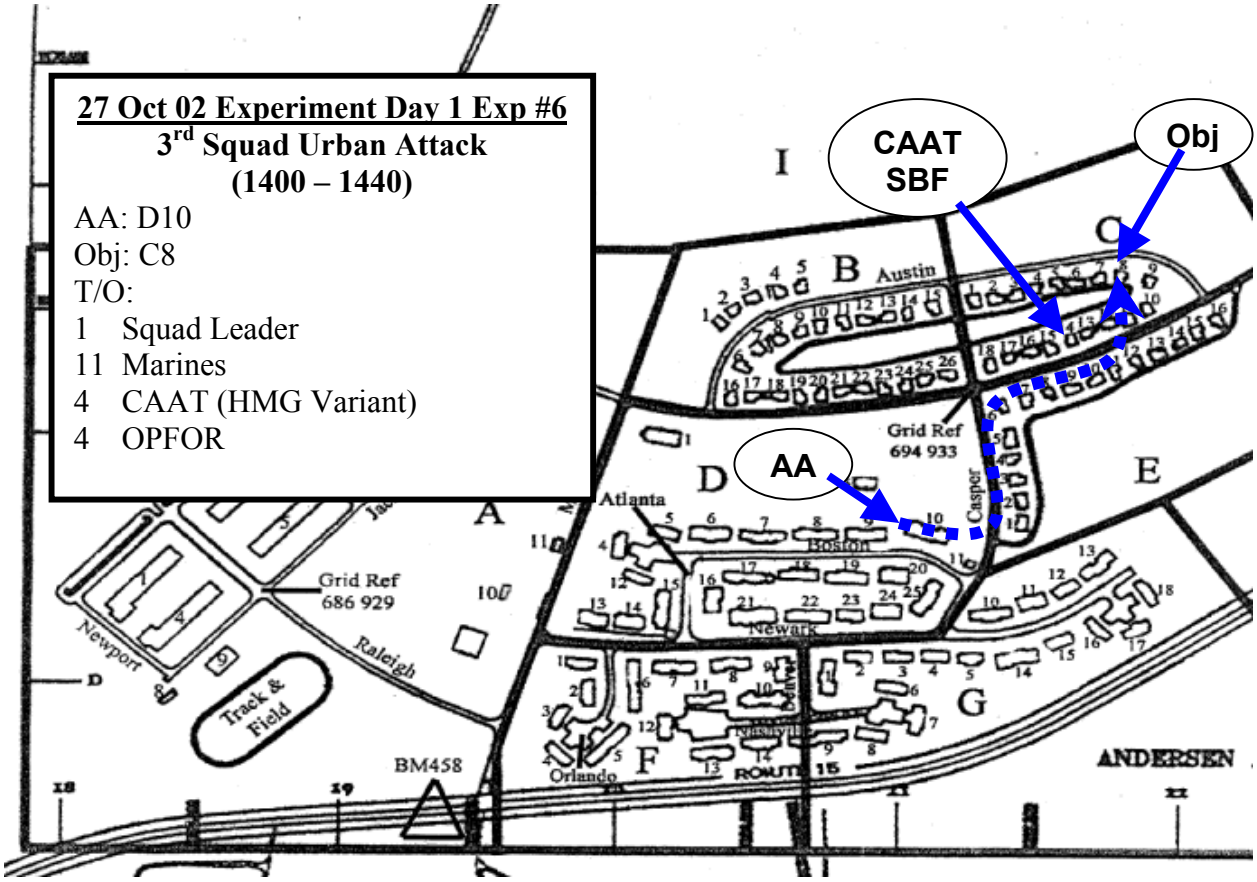
- FTs bounded and provided each other over watch.
- Good employment of the SAM, especially on rooftops.
- SAM accurately reported disposition of civilian with radio.
  - However, SAM places himself in the open and is eventually killed by the sniper.
- Coordination of the isolation of buildings proved difficult.
- Overall communication was difficult.
- They lacked a *"No-Comm"* plan.
- Squad made good use of "Go Firm" to improve the PC's situational awareness.
- Platoon commander was aware that OPFOR was using civilians as spotters.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Man with stick outside	Yes	Yes	No		D18	SAM spots man but does not relay info to anyone until O/C tells him to do so.
2. Man in window with no gear	No	No			D16	SAM could not see through the window due to glare on glass
2. 782 gear laying in yard	Yes	Yes			D16	SAM initially reported gear in wrong building
4. Ammo can on roof	Yes	Yes			F12	PL observed initially and did not report so that SAM could confirm
5. Man with radio – no weapon	Yes	Yes	No		F11	SAM ID's and confirms man has radio
6. Sniper	No	No			F10	APL observed and reported sniper

SAM's Impact.

- Marines reported that SAM's presence in the squad provided Marines with a sense of security due to his ability to provide overwatch.
- SAM clarified that the man in the yard only had a stick and was not a threat.
- SAM accurately reported that the civilian had a radio
  - This alerted the PC that a sniper might be in the area.
- Sniper killed the SAM as he was kneeling in an open area attempting to get a better observation.
  - Another Marine picked up the SAM's rifle/optic and continued the patrol.



Description of Events:

- 3rd Squad tasked to conduct an urban attack on C8 defended by 4 OPFOR.
  - Objective was lightly reinforced.
- At 1405, the squad departs for their assault position at C12.
- CAAT tasked to provide a SBF position between C14 and C15.
- Squad leader controlled the squad's movement to the objective.
- SAM was emplaced on the rooftop of C6 for over watch and eventually C13.
- SAM observes wire obstacles and relays orders from SL to the TLs as well as disposition of objective.
- When in position, SBF kicks off assault.
- Smoke is employed to cover movement.
- Lead fire team attempts to enter the objective.
- Shortly thereafter, the support FT is called.
- Squad then enters through a window.
- Squad received eleven (11) casualties.
- Three of the four OPFOR are KIA.

Overall Comments:

- Movement from AA to assault position was slow and methodical.
- FTs bounded and provided each other over watch.
- Good employment of SAM.
- SAM reported disposition as well as relayed orders from the SL to TLs.

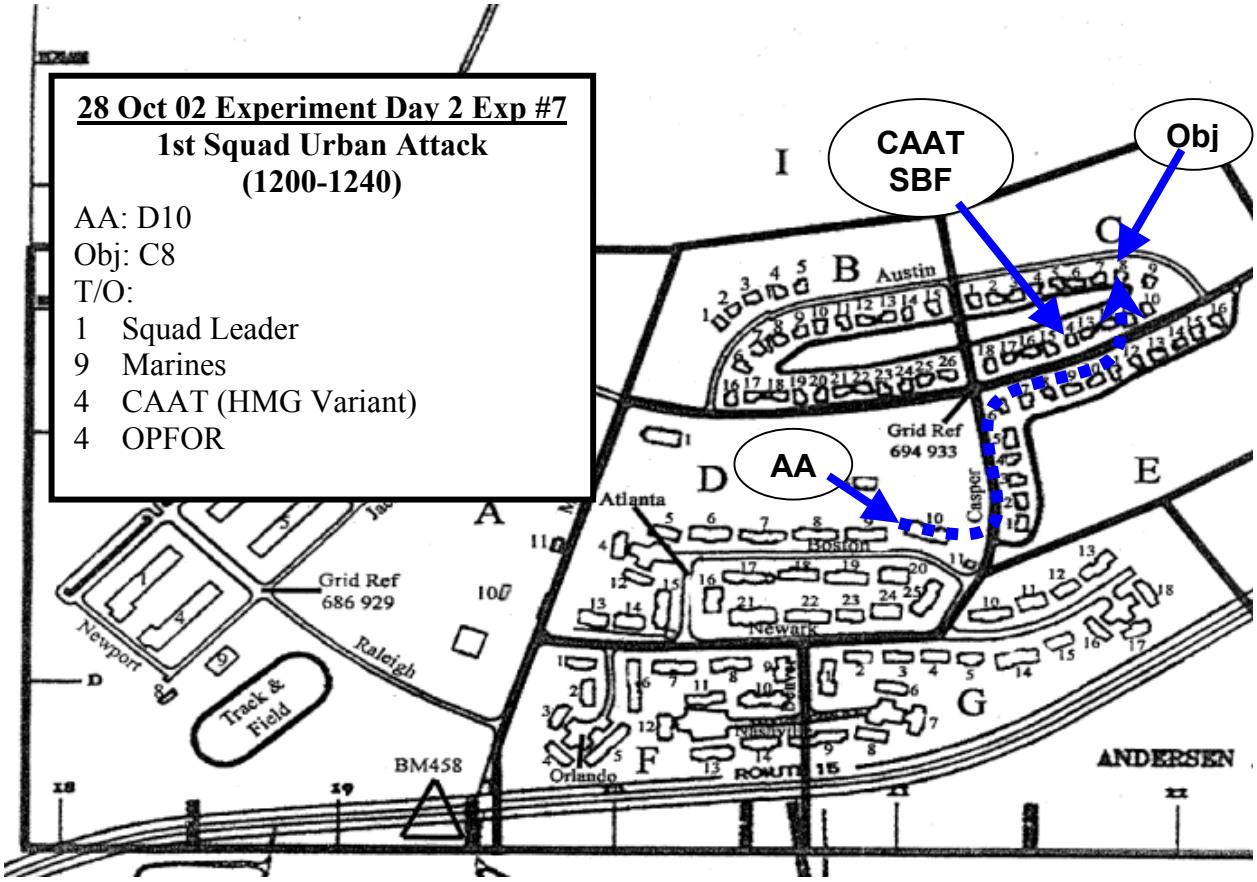
- Squad made good use of the CAAT vehicle.
- Besides being the SBF, the vehicle was used to emplace the SAM on top of rooftops (because the squad did not bring their ladder).
- Overall communication was difficult.
  - Lacked *"No-Comm"* plan.
  - However, the SAM aided in relaying message traffic.
- Smoke was employed to cover the assault element movement from assault position to the objective.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Red fire extinguisher	No				C17	
2. Wire obstacles	Yes	Yes	No		C8/C11-C12	Reported C8 wire at 1426 south of C8. Only told team leader about C11-12
3. Red box	Yes	Yes	No		C9	O/C did not hear transmission
4. Red, white, blue can	No				Vic C7	
5. Green marker	No				C8	
6. SAW gunner	No				C8	
7. Runner w/drawer	No				C12	

SAM's Impact.

- Identified wire obstacles around the objective and informed his team leader of the obstacle.
- Provided overwatch and observation for squad's movement.
- Was on C12 in overwatch position when attack began. Identified two (2) OPFOR fleeing from the NE side of C8.
  - SAM killed both of them.



Description of Events:

- 1st Squad tasked to conduct an urban attack on C8 defended by 4 OPFOR.
  - Objective was lightly reinforced.
- At 1200, the squad departs for their assault position at C12.
- CAAT tasked to provide a SBF position between C14 and C15.
- Squad leader controlled the squad's movement to the objective.
- SAM was emplaced on the rooftop of C6 for over watch and eventually C13.
- SAM did not initially report wire obstacle on south side of C8.
- When in position, SBF kicks off assault.
- Lead fire team attempts to enter the objective.
- Shortly thereafter, the support FT is called.
- Squad then enters the building
- Lead elements have difficulty using grenades.
  - They dropped them attempting to enter.
- Squad received nine (9) casualties.
- Three of the four OPFOR are KIA.

Overall Comments:

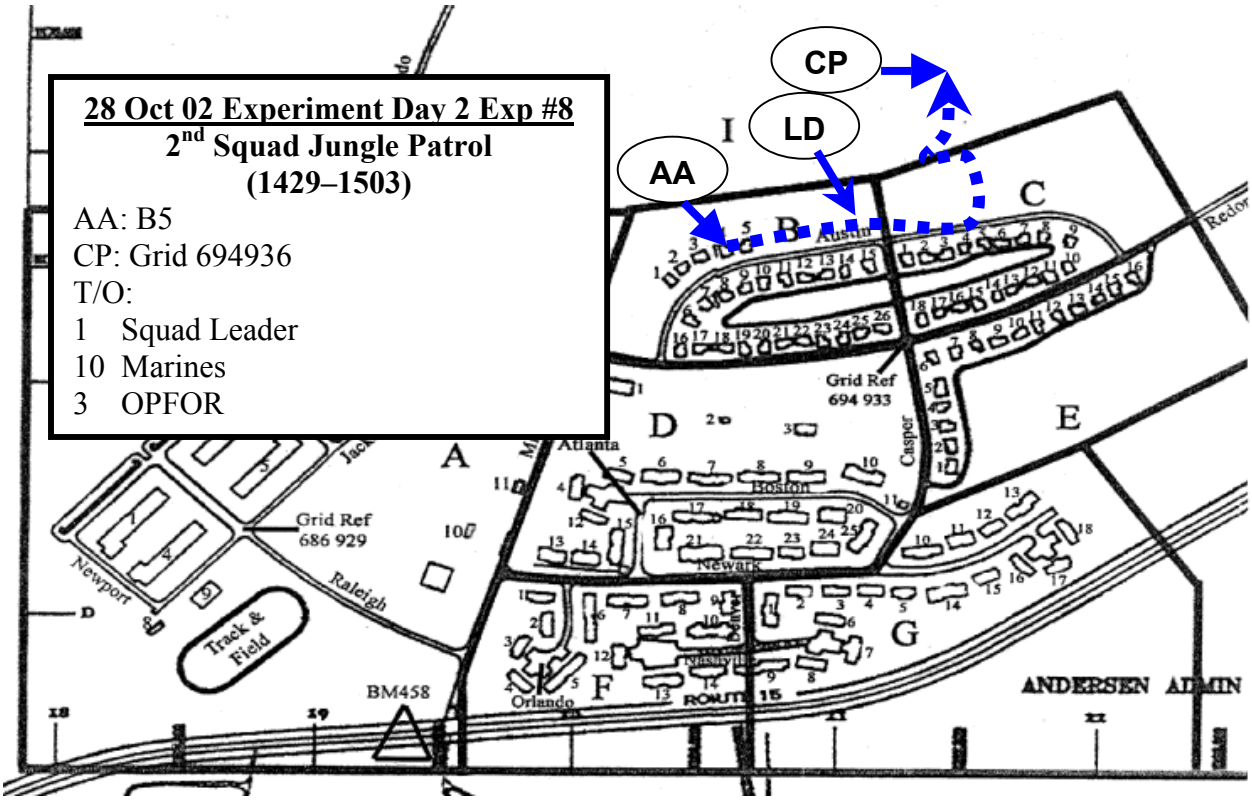
- FTs bounded and provided each other over watch.
- Good employment of SAM.
  - On rooftops and side of buildings.

  - Good use of ladders to put SAMs on rooftops.
- CAAT used cold and hot positions; however, they kept their engine running which caused it to be heard all the way to the objective.
- CAAT lacked any semblance of security.
  - All CAAT personnel remained inside their vehicle throughout the entire event.
- Squad had good overall momentum after LD.
- Poor grenade employment.
  - Four (4) friendlies killed by own grenades.
  - Two (2) others wounded.

SAM Score Card						
Opportunity	**Observed**	**Reported**	**Engaged**	**Hit**	**Location**	**Remarks**
1. Red fire extinguisher	Yes	No			C17	Bad comm. Tried to tell team leader.
2. Wire obstacles	No	Yes			C8/C11-C12	Not seen with optic.
3. Red box	Yes	No	No		C9	Spotted by Team leader
4. Red, white, blue can	No				Vic C7	
5. Green marker	No				C8	
6. SAW gunner	No				C8	
7. Runner w/drawer	No				C12	Spotted by someone else

SAM's Impact.

- 1st Squad had two (2) SAMs in their squad.
- SAMs reported that having the radios made them feel more "in the loop" during the attack and this eased the passing of information that that observed/obtained.
- Provided overwatch and observation for squad's movement.
- One of the SAMs was KIA during the attack.
  - His optic was also shot during the attack.



Description of Events:

- 2nd Squad tasked to conduct jungle patrol as shown.
- SAM emplaced to cover avenues of approach.
- At C6, squad conducts security halt before moving north into the jungle patrol route.
- Point man identifies the cache site.
- SAM moves forward to identify cache content as an AT4, MREs, and ammo.
  - Squad bypasses.
- Squad reaches an open area in the jungle.
- SAM moves forward to observe what seems to be a dead OPFOR.
- OPFOR was supposed to be dead per the MSEL, but he kept moving around.
- SAM scans the area and sees three OPFOR in a covered area behind their dead comrade.
- Squad deploys into an attack formation.
- Squad throws a grenade and WSP to initiate an attack on the OPFOR.
- Squad assaults through and consolidates.
- They maintained their position to await a counterattack that never occurred.
- Squad searches dead OPFOR, gathers KIAs and retrogrades.
- Three (3) BLUFOR casualties.
- Three (3) OPFOR KIA.

Overall Comments:

- Speed of movement was good.
- Noise discipline was excellent.
- SL was definitely in control.
- SAM and point man worked well together.

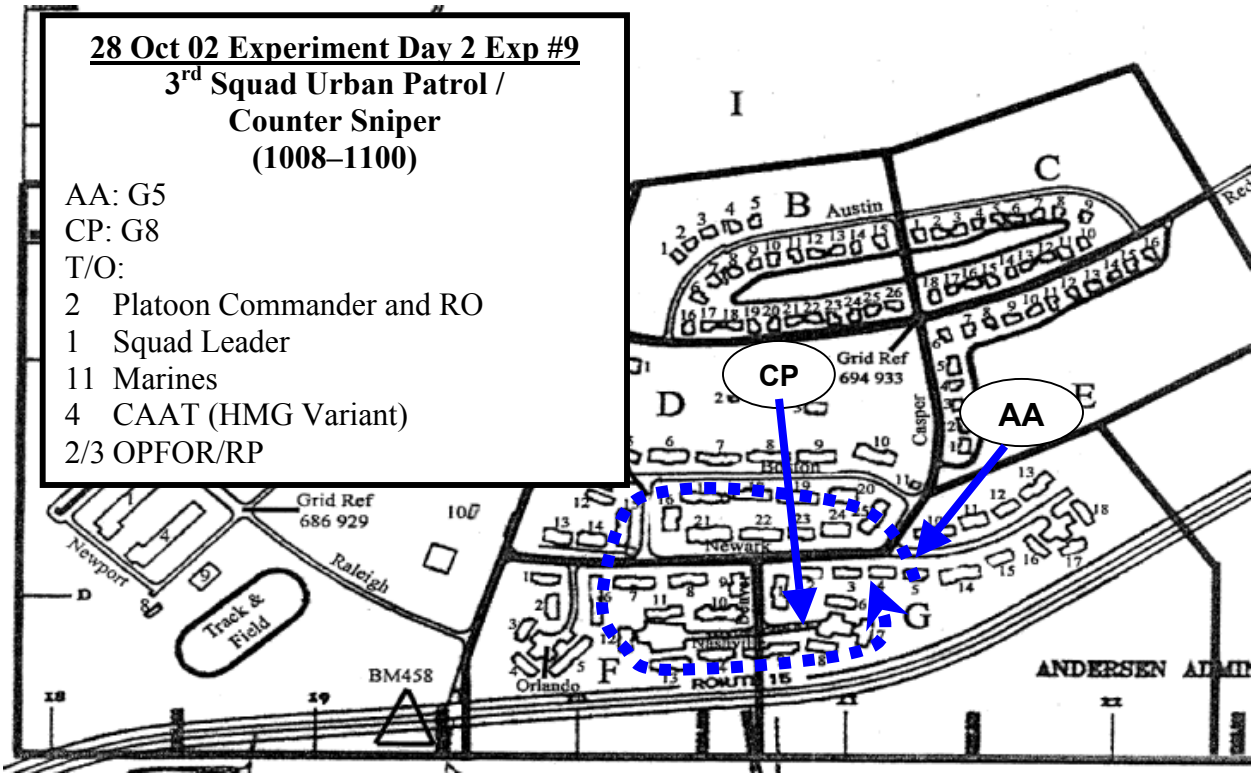
- Good patrolling techniques.
- Squad lost element of surprise when grenade and WSP were used.
- Search techniques of KIA were poor.
  - SOPs need to be established and rehearsed.
- Navigation was easy due to the fact that the route was cut out for them.
- SL controlled consolidation and emplaced his elements where he believed was best to deal with a counterattack.
- Communications were excellent internal to the squad.
  - As well as to higher.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Cache site (ammo, MREs and AT-4)	No	Yes			50 meters into patrol	Point man sees cache and call SAM up to confirm. SAM reports to squad leader
2. Wounded enemy	Yes	Yes	Yes	Yes	694936	SAM located, engaged and reported.
3. Locate OPFOR	N/A	N/A			694936	OPFOR was on the objective using the dead body to bait the squad into an ambush

SAM's Impact.

- SAM gave a detailed description of the items in the cache to squad leader. This alerted the squad to the possibility of enemy in the area and some of their capabilities.
- Located and identified the dead OPFOR while scanning the open area. He engaged the "dead" OPFOR because he was moving.
- During the assault, SAM located and identified behind some cover and engaged with a lethal shot.



Description of Events:

- 3rd Squad tasked to conduct an urban patrol in area D, F, and G.
- At 1157, the squad departs their AA along their prescribed route.
- Squad emplaces one FT and SAM in overwatch while other two FTs maneuver on route.
- SAM emplaced on rooftops of D16, D8.
- Platoon commander moved on route with SAM.
- At D20, squad receives fire. Nobody is sure of enemy location.
- Squad eventually reports sniper and SAW gunner on rooftop of D8.
- Both OPFOR killed by SAW gunner from across the street.
- FT dispatched to clear the building and squad resumes movement.
- At F6, squad leader reports his position incorrectly to PC.
- Another FT reports movement at F6 and requests permission to open fire.
- SAM observes and confirms that the movement is friendlies.
  - It was the CAAT that was tasked to provide SBF on F6.
  - This prevents a blue-on-blue engagement.
- Squad continues on route and reenters friendly lines with no casualties.
- Both OPFOR are KIA.

Overall Comments:

- FTs bounded and initially provided each other overwatch—then it just fell apart.
- Good employment of SAM, especially on rooftops.
- SAM properly used the optic to differentiate between friendlies and OPFOR.
  - This prevented a potential fratricide.

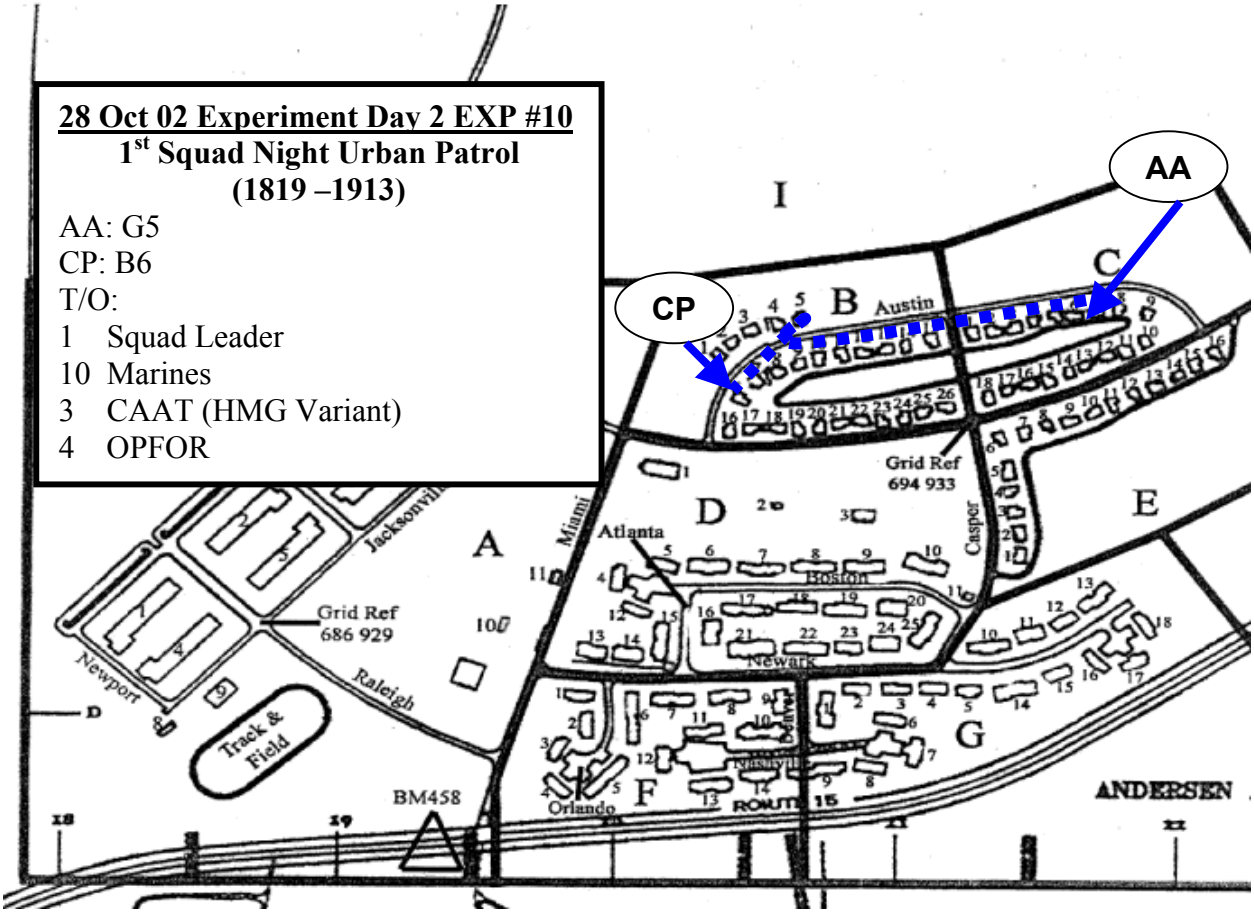
- Overall communication was difficult—lacked *"No-Comm"* plan.
- Leaders were not reporting up.
- Despite use of "Go Firm" SA was very poor.
- Land navigation was a friction point. Poor position reporting almost killed the squad leader and the FT he was traveling with.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Man with stick outside	Yes	Yes	No		D19	SAM makes initial sighting and then his team moved forward to investigate.
2. Man in window with no gear	Yes	Yes	No		D15	SAM ID's and reports man in window. Squad leader orders team to clear building.
3. 782 gear laying in yard	Yes	Yes			F6	SAM spots and reports.
4. Ammo can on roof	No	No			F12	
5. Man with radio – no weapon	No	Yes	No		G7	Team sees man initially and SAM confirms no weapon.
6. Sniper(s)	Yes	Yes	Yes		D22	SAM identified sniper and reports and suppresses. Directs nearby SAW to fire on the snipers.

SAM's Impact.

- SAM was able to position himself to observe and direct effective fires. If he had live ammo rather than short-range simunitions/SESAMS, he could have eliminated the snipers himself.
- Despite navigation errors, SAM was able to stop an attack on a friendly position.
  - This prevented blue-on-blue / fratricide event.
- Sam's ability to direct the SAW fire on the snipers resulted in both snipers being killed.
- SAM provided overwatch and observation for squad's movement.
- SAM admitted that he was focusing on engagement techniques and forgot about reporting the things he saw.



Description of Events:

- 1st Squad tasked to conduct an urban night patrol in areas B and C.
- At 1819, the squad departs AA along the prescribed route.
- Squad moves out with CAAT initially in the lead and sets into position at C5.
- Squad continues along route and emplaces a SAM at C1.
  - CAAT is now in the tail end.
- Contact initiated by OPFOR from the NW area of B buildings.
- SAMs attempt to engage snipers but it is CAAT that moves up and engages snipers located at B6.
- Endex is called.
- BLUFOR suffers four (4) casualties.
- Two (2) snipers are killed.

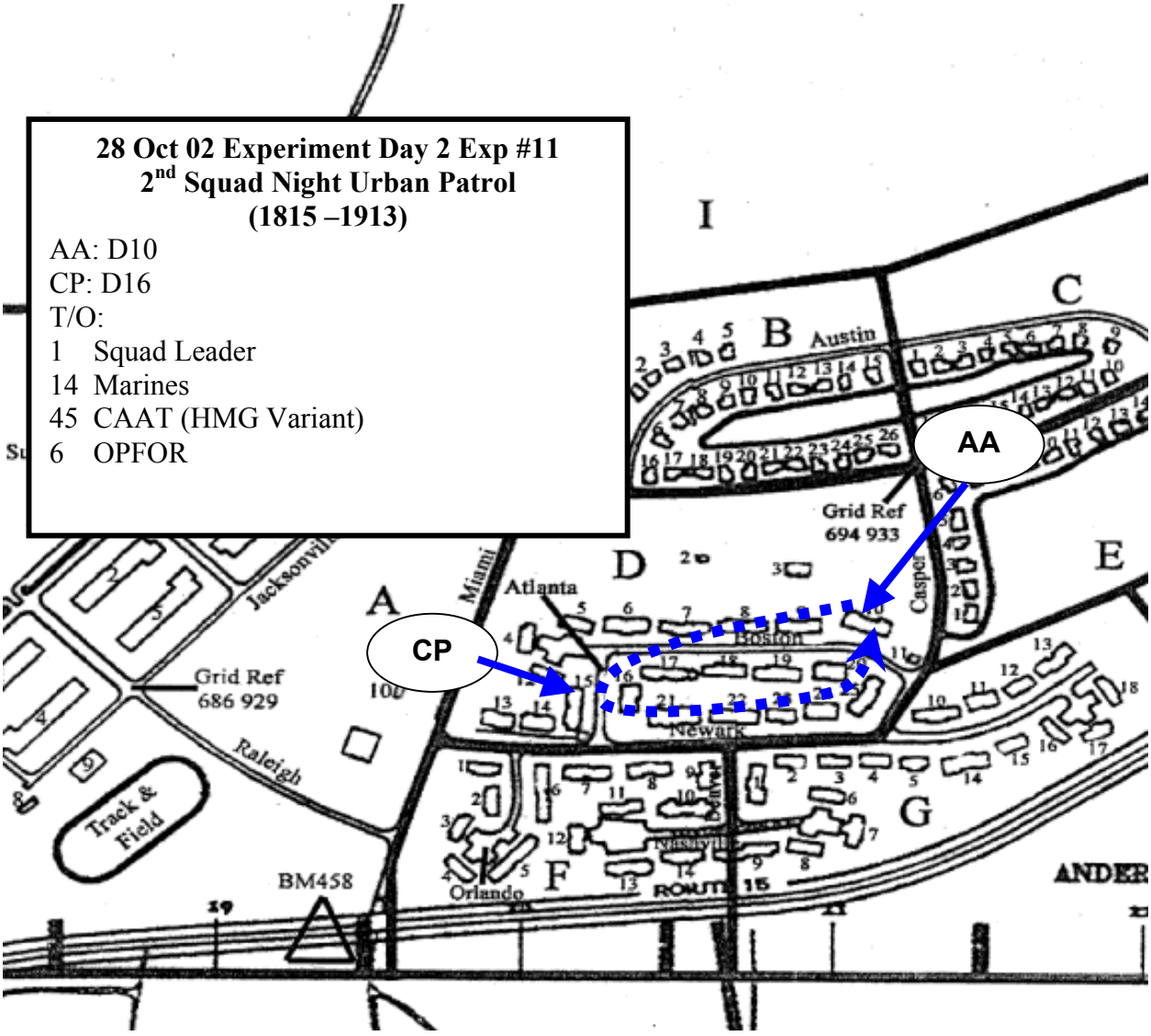
Overall Comments:

- FTs bounded and provided each other overwatch.
- Satelliting was present throughout the conduct of the patrol.
- Good employment of the SAM, especially on rooftops.
- BLUFOR did not use NVD nor were they accustomed to using it.
- The fogging of the goggles and masks defeated the advantage of the ANPVS-17

SAM Score Card						
Opportunity	**Observed**	**Reported**	**Engaged**	**Hit**	**Location**	**Remarks**
1. Runner with smoke	No	No			B6 to B7	
2. Chem light #1	Yes	Yes			B16	Reported to squad leader
3. Chem light #2	Yes	Yes			B8	Reported to squad leader
4. Chem light #3	Yes	Yes			B18	Reported to squad leader

SAM's Impact.

- 1st squad had two (2) SAMs in the squad.
- One of the SAMs engaged the sniper. He suppressed him but did not eliminate him.
- Neither SAM had a significant impact on the fight in that they did not acquire the threat before contact was initiated by the OPFOR.



Description of Events:

- 2nd Squad tasked to conduct an urban night patrol in area D.
- At 1815, squad departs the AA along their prescribed route.
- Squad emplaces the SAM at designated buildings to cover its movements.
- In one instance, members of the squad saw two persons.
- SAM confirms that the two persons were O/Cs and not civilians or OPFOR.
  - This happened several times throughout the conduct of the patrol.
- Eventually, the lead trace reaches D16.
- Lead FT with a SAM engages movement on the rooftop of D15.
  - There was no positive identification of OPFOR—just their movement.
- TL orders cease-fire until the SAM could confirm OPFOR on the rooftop of D15.
- SAM confirms that he sees an AT4 and the FT reengages.
- The hesitation gives the OPFOR time to fire their AT4 effectively killing the SAM and injuring two of his teammates.

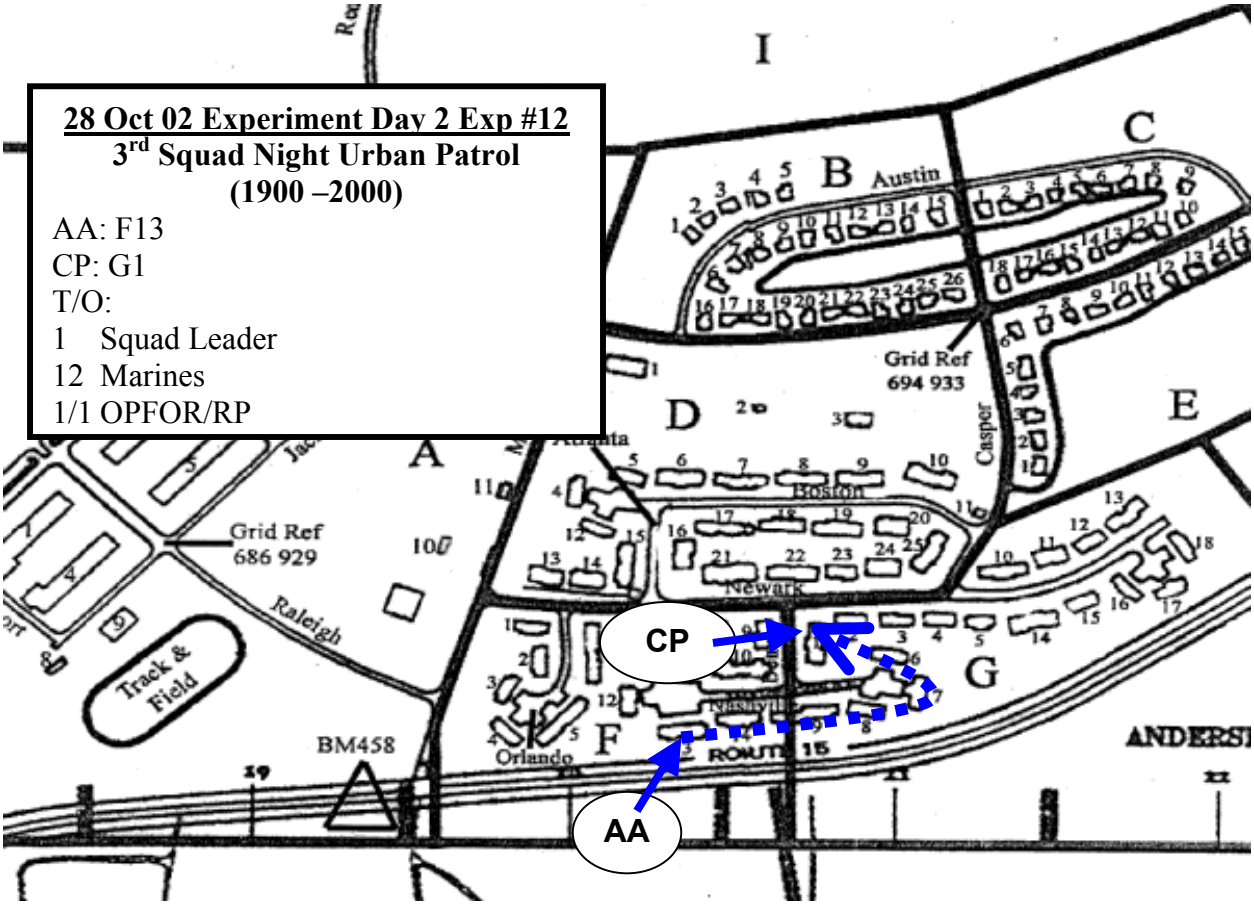
- Following the engagement, three casualties are resurrected and the patrol continues.
- Endex is called.
- BLUFOR suffers five casualties during the engagement.
- Two snipers are killed.

Overall Comments:
- FTs bounded and provided each other overwatch.
- Satelliting was present throughout the conduct of the patrol.
- Good employment of the SAM, especially on rooftops.
- BLUFOR did not use NVD nor were they accustomed to using it.
- SAM was able to identify OPFOR during the low visibility engagement; however, it was a little too late.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1 Prayer	Yes	Yes	No		D19	
2. Sniper	Yes	Yes	Yes	Yes	D16	SAM spotted
3. Spotter	Yes	Yes	Yes	Yes	D16	SAM spotted
4. Man in window	No	No			D15	

SAM's Impact.
- Used in overwatch position throughout the patrol.
- When a FT engaged personnel on a rooftop, they stopped their engagement because they were unsure if the personnel were friendly or enemy.
  - SAM was able to positively ID that they had weapons (AT-4s) and that they were enemy.



Description of Events:

- 3rd Squad tasked to conduct urban night patrol in areas F and G.
- At 1900, squad departs the AA along their prescribed route.
- Squad emplaces the SAM at designated buildings to cover its movements.
- A civilian is reported and a security halt is called.
  - At G7/8
- A squad member speaks with the civilian who reports activity near G1 and F10.
- Squad continues along their route.
- OPFOR initiates contact with lead FT at G1.
- OPFOR eventually surrenders because he is out of ammo.
- This conflicts with the fact that the SAM believes that he engaged and killed the sniper.
- Squad enters and clears building G1.
- During the firefight, the SAM and the FT he was traveling with disappear and do not show up again until after endex is called.
- BLUFOR suffers no casualties.
- One sniper was killed.

Overall Comments:

- FTs bounded and provided each other overwatch.
- Satelliting was present throughout the conduct of the patrol.

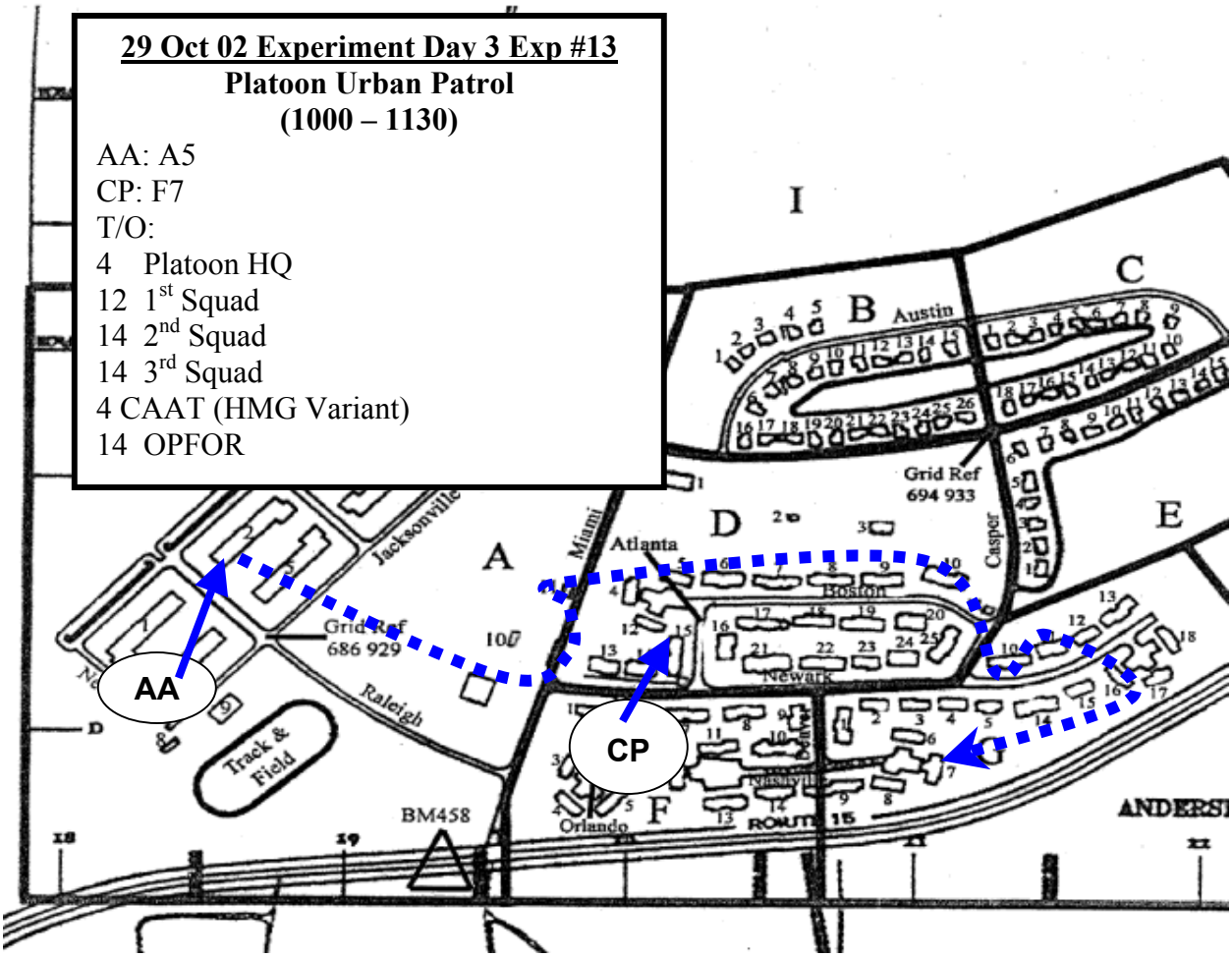
- Good employment of the SAM, especially on rooftops.
- BLUFOR did not use NVDs nor were they accustomed to using them.
- Squad was not prepared to depart on time.
- Squad was moved back to the AA shortly after step off in order to re-cock.
- Squad made some use of intelligence given to them by the civilian they encountered.
- SL orders SAM to scan the areas reported by the civilian to be showing some enemy activity.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Two men running	No	No			F10 to G7	
2. Civilian	Yes	Yes	No		G7	SAM spots civilian and positively Ids and reports to squad leader.
3. Weapon in window	No	No			G1	
4. Sniper	No	No	Yes	Yes	F10	SAM locates sniper after he initiated contact. Sees sniper muzzle flash through PVS-17 and engages.

SAM's Impact.

- PVS-17 night scope enabled SAM to positively ID the civilian and avoid a possible a casualty. Point man could not identify the man with PVS-14.
- Positive ID of the civilian allowed the squad leader to decide to stop and talk to the civilian to get intelligence from him.
- PVS-17 night scope enabled the SAM to see the muzzle flash of the sniper and locate his position.
- SAM said he engaged the sniper and was confident that he killed him. It turned out that sniper was killed by somebody else first.



Description of Events:

- Platoon tasked with conducting an urban patrol of Areas D, F, and G.
- Patrol was reinforced with a CAAT vehicle (HMG variant).
- At 1000, platoon departs AA and crosses Area A field.
- Shortly before crossing Miami, 2nd Squad spots two civilians on Newark with straw hats, radios and binoculars at F6.
- PC moves CAAT to D5/6.
- CAAT reports one enemy on the rooftop of F7.
  - 3rd Squad confirms this report.
- 3rd Squad receives fire from vicinity of F Area.
- PC instructs 3rd Squad to eliminate the enemy threat and orders the other two squads to continue west along the route.
  - 3rd Squad reports enemy sniper killed.
- 3rd Squad reports enemy spotter position at D25 and eliminates the enemy.
- CAAT positioned to cover Boston.
- Platoon continues movement into the G area and then turns west heading back to the F area.
- 2nd and 3rd Squads eventually link up and endex is called.
- Platoon suffers one (1) casualty.
- OPFOR has five (5) casualties.

Overall Comments:

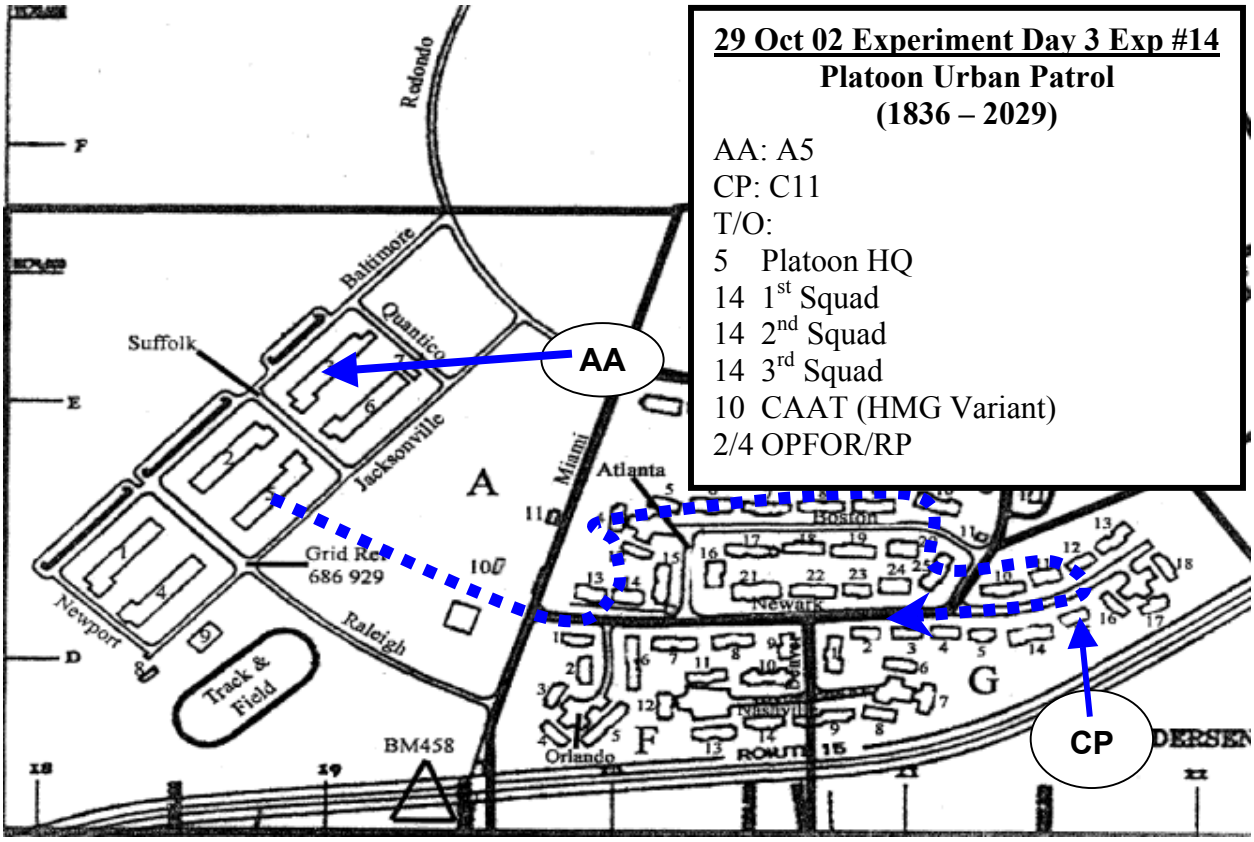
- Movement from AA through patrol route was done well.
- FTs bounded and provided each other overwatch.
- SAMs placed on rooftops to cover movements.
- The satelliting effort proved worthwhile.
- 3rd Squad was in position to engage the snipers once located.
- CAAT was effectively employed to move SAMs rapidly from one position to another.
- Because of the inability to pinpoint OPFOR positions after shots were fired, the platoon was distracted from their mission of patrolling.
  - This was remedied by advising the PC to keep pushing his other two squads.
- Link-up with 3rd Squad proved to be consuming.
  - There was no link-up plan in the order.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Man	Yes	Yes	No		A6	SAM from 2nd Squad reports to squad leader
2. Man	Yes	Yes	No		Corner of Redondo and Miami	SAM from 2nd Squad sees man with naked eye. Spots M16 on man's back with muzzle up. TL from 1st Squad also reports hi.
3. Man in window	No				F2	
4. Man	Yes	Yes	No		Intx of Boston and Atlanta	Seen by SAMs from 2nd and 3rd Squads. 2nd Squad SAM reports man.
5. Two bush cutters	No				D18, 20	
6. Sniper /Spotter	Yes	Yes	Yes	Yes	D15	3rd Squad SAM heard sniper fire and moved to rooftop and located sniper. He engaged and killed sniper.
7. Man cleaning window	No				G13	

SAM's Impact.

- All SAMs were employed in overwatch / cover positions.
- SAMs gave the PC the SA on personnel in the AO relative to friendly or enemy.
- Positive ID of personnel was crucial for PC to determine which COAs to take.
- 3rd Squad SAM killed the sniper.



Description of Events:

- Platoon tasked with an urban patrol of Areas D, F, and G.
  - Patrol was reinforced with a 2 CAAT vehicles (HMG variant)
- At 1832, crosses Area A field using the cover of night to move across the open area.
- Shortly before crossing Miami, a civilian is spotted on Newark by 2nd Squad.
- 2nd Squad also reports F4 lit up with lights.
- 1st Squad captures an EPW at D7.
- Platoon eventually reaches D25 and prepares to move into the G area.
- SAM emplaced on rooftop of D25 to cover platoon's movement.
- Smoke used to cover the platoon's crossing of Casper.
- PC informs CAAT that enemy has been spotted in the vicinity of G14.
- PC shoots pop-up over what he thinks is the enemy location but flies directly over his position.
- CAAT (E1) opens up in the direction of the platoon HQ.
- Four Marines from 1st Squad and HQ are killed by friendly fire (PC and SL included).
- After reorganizing, a squad crossed into G15 and clears the building.
- Smoke used to cover platoon's crossing of Casper.
- SAM on top of D25 shoots and suppresses the sniper position on the rooftop of G15.
- SAM is credited with one kill.
- Platoon suffers seven (7) casualties (4 WIA, 3 KIA).
- OPFOR suffers one (1) WIA and one (1) KIA.

Overall Comments:

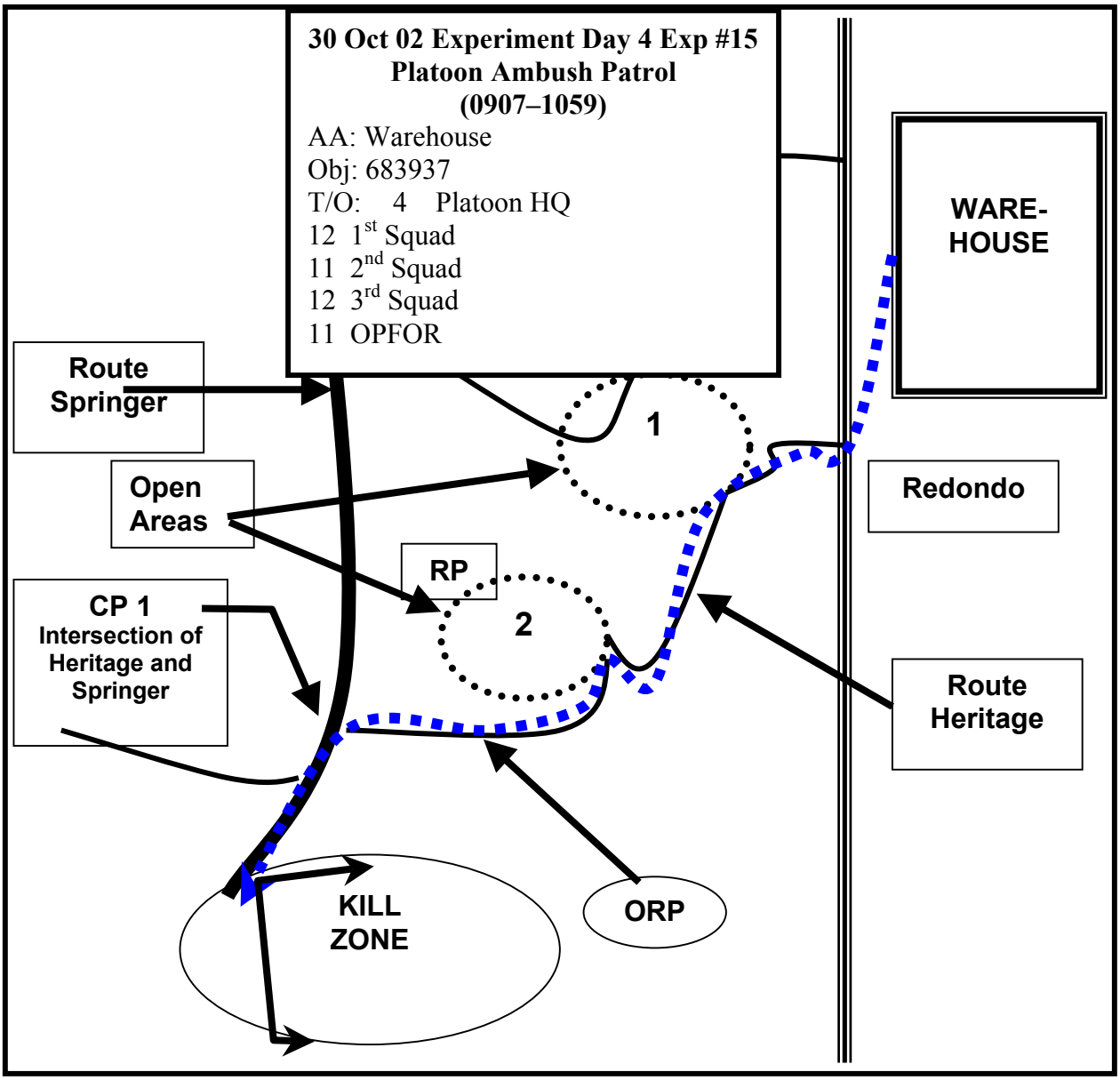
- Movement from along route was done well.
- FTs and SAMs bounded and provided each other with overwatch.
- Noise discipline was lacking.
  - For example, instead of using the available radios, commands were shouted.
- Comm with all units was difficult—lacked a *"No-Comm"* plan.
- Smoke employed to cover platoon's movement across Casper.
  - OPFOR was not able to get good visibility of platoon's crossing.
- Good use of SAM to cover crossing of open areas.
- Bad use of pop-ups to mark target reference points.
  - Wind took the pop-up directly over the HQ's position and caused a blue on blue incident.
- Very few members of the platoon brought their NVGs.
- CAAT did not bring any.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. OPFOR runner	Yes	Yes	No		D7	
2. Lights in building	Yes	Yes			D4, G1, E1	2nd Squad SAM sees D4, 3rd Squad sees G1
3. Sniper	No	Yes			D10	Sniper engages platoon and then moves to G15
4. Sniper team with SAWs	Yes	Yes	Yes	Yes	G15	1st and 3rd Squad SAMs see snipers; 3rd Squad SAM engages
5. Two men	Yes	Yes	No		Corner of Atlanta & Newark (F7)	2nd and 3rd Squad SAMs observe and report

SAM's Impact.

- 3rd Squad SAM engages two SAW positions on G15; credited by O/C with one kill.
- SAM prevented fratricide by identifying friendlies during satellite patrolling because he had the ability to differentiate between OPFOR and friendly.
- SAM placed effectively on rooftops to provide overwatch and accurate fires during contact.
- Because the SAM was in a good overwatch position and could provide accurate suppressive fires, Marines stated that they felt more secure when moving across open areas into the attack.
- SAM's ability to see through windows in buildings depended on his positioning and sight angles.



Description of Events:

- Platoon tasked with conducting an ambush patrol.
- At 0907, platoon departs AA at the warehouse and travels along route shown above.
- Platoon goes firm at open area 2.
- SAM scans the area and identifies two civilians (RPs) in the northwest edge of the clearing.
- PC orders a bypass and patrol continues to checkpoint 1.
- PC designates the ORP and issues his five paragraph contingency plan for the leader's reconnaissance of the ambush site.
- Leader conducts reconnaissance.
  - Leader's recon returns to the ORP and reconfirms plan with the remainder of platoon.
- Security is emplaced at CP1 oriented north along Springer as well as at the ORP.
- Platoon emplaces at the ambush site.

- Shortly, thereafter, enemy movement is detected moving towards the kill zone.
- Seven OPFOR enter the kill zone, and the point man makes visual contact with BLUFOR and attempts to signal back to his SL.
- At that point the ambush is initiated by BLUFOR.
- Command to cease-fire is given.
- PC orders search of dead bodies.
- Platoon then pops smoke and begins movement back the ORP.
- A four-man OPFOR reinforcement moving south along Springer engages and kills the security unit emplaced at CP1 (two Marines).
- OPFOR continue south and run head on with the main body of the platoon.
- After a major engagement, all eleven (11) OPFOR are killed.
- Sectors of fire were not deconflicted at the ambush site
  - This resulted in fratricide.
- Platoon conducts consolidation and picks up casualties and return to the ORP.
- Endex is called at the ORP. Platoon suffers 18 casualties.
  - Friendly fire killed nine (9) BLUFOR.
- OPFOR suffers 10 KIA 1 WIA.

Overall Comments:

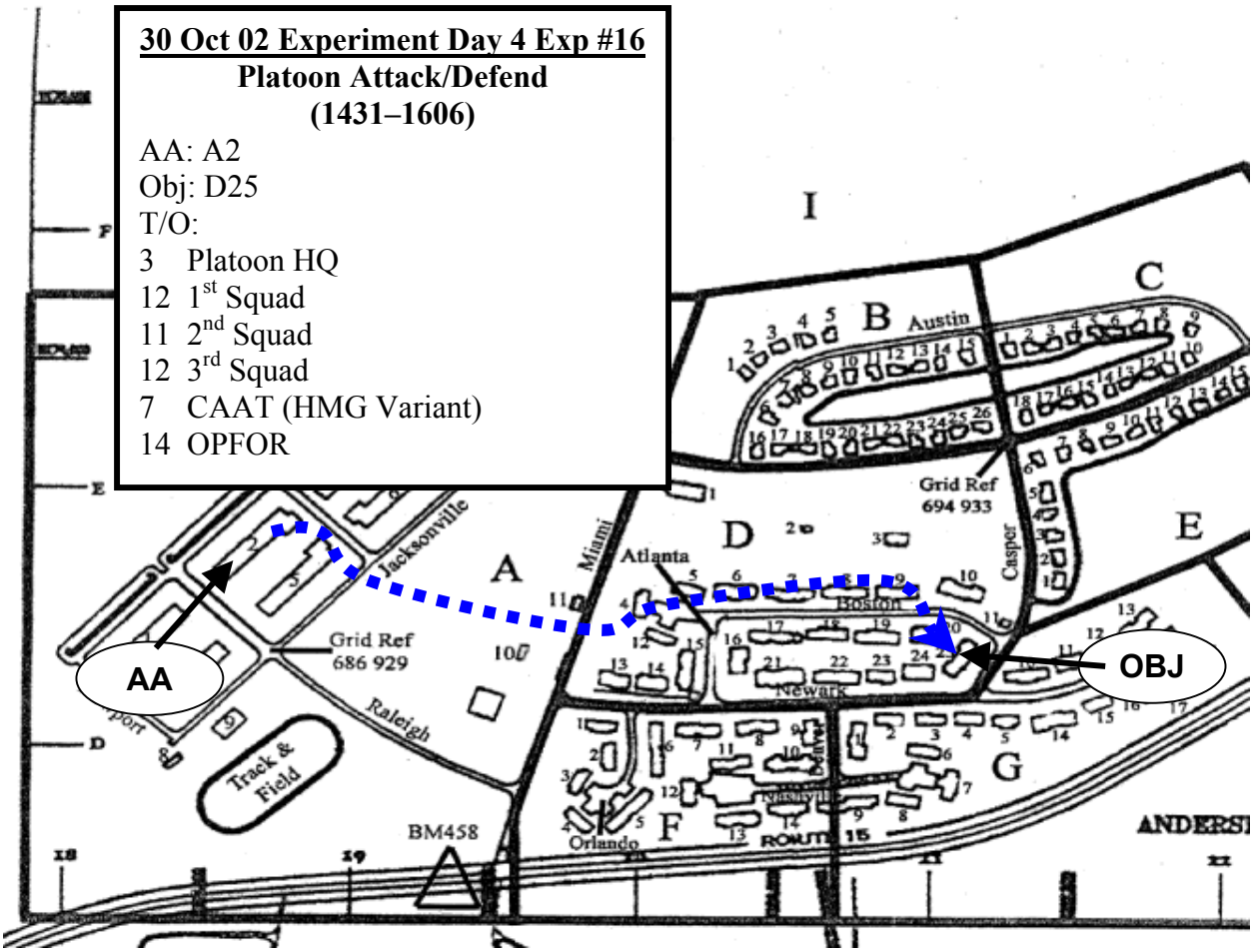
- SAM was not often in a favorable position to take advantage of optic capabilities.
- Inept security caused multiple casualties for the BLUFOR.
- Volume of fire in the kill zone was excellent.
- Hesitancy on the part of the OPFOR resulted in a successful ambush by the BLUFOR.
- Unfortunately, sectors of fire were not deconflicted at the ambush site, which resulted in friendly fire incidents.
- OPFOR counterattack/reinforcement compromised BLUFOR's rear security and caused havoc/casualties for the BLUFOR.
- Good use of communication assets, however, there were still a lot of verbal commands.
- Leaders recon did a good job of picking kill zone.
- Platoon had a good understanding of the conduct of the ambush.
  - HOWEVER, they overlooked the importance of deconflicting fires by all shooters.
- Once the casualty numbers started rising, accountability and reporting were inaccurate.

SAM Score Card

Opportunity	Observed	Reported	Engaged	Hit	Location	Remarks
1. Two civilians	Yes	Yes	No		NW corner of Open Area 1	3rd Squad SAM identified civilians and tries to report to his SL but radio is not working
2. Enemy at ambush site	Yes	No	Yes	Yes	683937	Noise of OPFOR alerted platoon. 3rd Squad SAM counts number in kill zone and reports to PC
3. Enemy reinforcements	No	No			Springer / Heritage Intersection	SAMs were not in the security position where enemy reinforcements came through

SAM's Impact.

- Alerted the PC on the size and disposition of the OPFOR at ambush site.
- During ambush SAMs killed two OPFOR. O/Cs could not verify which specific SAM.
- During movement to ambush site, SAM was used to cover long avenues of approach.



Description of Events:

- Platoon tasked to conduct a deliberate attack on D25.
  - Platoon reinforced with two HMG vehicles (.50 cal).
- At 1431, platoon crosses the LOD.
- Two OPFOR emplaced at D18 and D22 (4 total).
- Ten OPFOR emplaced at D25.
- Four OPFOR's mission at D18 and D22 was to delay and harass the attack.
- Platoon receives fire from D18 as it reaches D8.
- SAM is deployed to the rooftop of D8 to get a better view of the situation.
  - SAM reports that OPFOR have already fled.
- Platoon pushes on and reaches D9—and receives fire from D25.
- Platoon prepares to move into assault position at D10.
  - CAAT moved to provide supporting fires for the assault.
- Attack initiated when CAAT is in place.
- PC ceases the fires and 2nd Squad moves into D25 and begins to systematically clear the building (Top/down, north to south).
- 3rd Squad is eventually called in to support 2nd Squad.
- D25 is effectively isolated from the N, W, E side.
- Platoon clears D25 and begins consolidation.

- **PAUSE EX**.
  - BLUFOR had 17 casualties.
  - OPFOR had 7 (of 14) casualties.
- All casualties revived.
- The platoon sets in the defense and prepares for the counter attack.
- Platoon's defensive plan:
  - 1st Squad in D10, D20, oriented N, W, and S.
  - 2nd Squad at D25 oriented E and W covering the G area.
  - 3rd Squad is located at D24 and G10, oriented S and SW.
  - CAAT is located at G10, G11 oriented N on Casper.
  - SAMs are located on the rooftops of their respective squads.
- OPFOR counterattack comes from the SE and moved NW.
  - Straight into the defenses of the platoon.
- OPFOR attempt to infiltrate with little success.
  - They receive heavy casualties.
- One OPFOR FT is able to infiltrate the SBF position (CAAT) and knock out a vehicle.
- Eventually, all OPFOR are killed.
- Endex is called.
- During the Defense:
  - OPFOR suffers fourteen (14) casualties.
  - BLUFOR has three (3) casualties.

Overall Comments:

- Movement from AA to Assault Position was done well.
- FTs bounded and provided each other overwatch.
- Smoke was employed to cover movements across open areas.
- Comm with CAAT was difficult—lacked a *"No-Comm"* plan.
  - Additionally, SBF was out of ammo due to lack of fire discipline.
- -Excellent use of ladders to clear from top/down.
- 2nd Squad leader did a very good job at the systematic clearing of the objective.
- In the defense, squads were well emplaced to cover any possible avenue of approach.
- Casualty reporting was not good.
  - The numbers reported to the PC were not accurate.
- The overall plan was simple—and it worked.

SAM Score Card						
Opportunity	**Observed**	**Reported**	**Engaged**	**Hit**	**Location**	**Remarks**
1. Sniper	No	Yes	No		D18	SAM located sniper after being engaged. He then reported to PC
2. Sniper	No	Yes	No		D22	SAM located sniper after being engaged. He then reported to PC
3. Sniper	Yes	Yes	Yes	Yes	D25	SAM located, reported and engaged
4. OPFOR maneuvering for counter attack					G5, 14, 15	SAN located, reported and engaged

SAM's Impact:

- SAMs were tactically emplaced at different locations along the platoon's route to the objective in order to provide over watch.
- During platoon movement they received fire from D18.
  - The SAM is emplaced on the rooftop of D8 to get a better view.
  - Platoon is temporarily halted while they figure out a course of action.
  - SAM sees that OPFOR has fled D18.
  - Platoon is able to continue with their movement.
- During the attack, a SAM was able to locate a sniper in the rooftop of D25.
- SAM reported its position to his PC, who in turn reported the situation to the assault force.
- In another instance, the SAM effectively engaged and eliminated an OPFOR in the open.
- During consolidation, all SAMs emplaced on rooftops to cover long avenues of approach.
- SAMs were able to see and provide ample warning of incoming OPFOR.
- During the counterattack, SAMs provided deadly accurate fire on OPFOR attempting to infiltrate.

Annex F – Casualty Summaries: Baseline and Experiment Events

Numbers extracted from O/C Activity Logs, Casualty Forms, and downloaded MILES data. The MILES data has been sorted by event times and scrubbed using "Reset" data to eliminate spurious kills.

Baseline Events.

- One (1) Platoon Event
  - Urban Security Patrol.
- Six (6) Squad Events:
  - Two (2) Urban Security Patrols (Counter Sniper).
  - Two (2) Urban Security Patrols.
  - Two (2) Jungle Patrols (Chance Contact / Meeting Engagement)

Experiment Events.

- Twelve (12) Squad Events.
  - Three (3) Urban Security Patrols (Counter Sniper).
  - Three (3) Urban Security Patrols.
  - Three (3) Jungle Patrols (Chance Contact / Meeting Engagement).
  - Three (3) Night Urban Security Patrols

- Five (5) Platoon Events.
  - Two (2) Urban Security Patrols.
  - One (1) Urban Attack.
  - One (1) Urban Defense.
  - One (1) Jungle Ambush Patrol.

Findings.

Impact of Optic on Casualties.

1. When SAMs or Team Leaders (TLs) with optics were casualties, average BLUFOR casualties tended to be higher and average OPFOR casualties tended to be lower than in events where they were not casualties.

	Average Casualties	
	BLUFOR	OPFOR
When SAM / TL were not casualties	19%	72%
When SAM / TL were casualties	35%	53%

2. SAMs/TLs with optics comprised 9% of the BLUFOR during all events and accounted for 24% of total OPFOR casualties.

3. One SAM accounted for 71% of SAM OPFOR KIAs in the initial twelve (12) squad events; i.e., 5 of 7 kills.

4. The average BLUFOR casualty and fratricide rate was lower during comparable experiment events than during baseline events. Specifically:

a. Platoon Baseline Events; i.e., *no* SAM /optic involved:
   (1) 41% casualty rate.
   (2) 19% fratricide rate.
b. Platoon Experiment Events; with SAM / optic involved:
   (1) 18% casualty rate.
   (2) 4% fratricide rate.
c. Squad Baseline Events; i.e., no SAM /optic involved
   (1) 35% casualty rate.
   (2) 6% fratricide rate.
d. Squad Experiment Events *with* SAM / optic involved:
   (1) 25% casualty rate.
   (2) 0% fratricide rate.

5. Fratricide and casualty rates during experiment events would have been higher, but SAMs on at least three (3) occasions identified/alerted that personnel who were about to be engaged were *friendlies* and prevented the engagement.

Legend. The abbreviations listed below are used in the charts for this section.

Cas - Casualty
Exp - Experiment
FF - Fratricide
UCS - Urban Security Patrol (Counter Sniper)
UP - Urban Security Patrol
UP - Urban Security Patrol
NUP - Night Urban Security Patrol
UAtk - Urban Attack
UDef - Urban Defense
J - Jungle Patrol (Chance Contact)
JA - Jungle Ambush Patrol

Comparison of Baseline and Experiment Casualties

SQUAD EVENTS								
	BLUFOR					OPFOR		
	Total In box	Cas	Cas (%)	FF	FF as % of Cas	Total In box	Cas	Cas (%)
Baseline Events	98	34	35%	2	6%	22	17	77%
Exp w/o Night Events	126	32	25%	0	0%	28	23	82%
All Exp Events	173	41	24%	2	5%	39	28	72%

Note: There were no night squad level baseline events.

PLATOON EVENTS		
	BLUFOR	OPFOR

	Total In box	Cas	Cas (%)	FF	FF as % of Cas	Total In box	Cas	Cas (%)
Baseline Events	51	21	41%	4	19%	14	10	71%
Exp w/o night and Jungle Events	138	25	18%	1	4%	42	26	62%
Exp w/o Jungle Event	195	28	14%	6	21%	44	28	64%
All Exp Events	234	46	20%	15	33%	55	39	71%

Note: There were no night or jungle platoon level baseline events.
There was only one platoon level baseline event.

BASELINE EVENTS CASUALTY SUMMARY

		BLUFOR					OPFOR				
Event	Type	Total In box	Cas	Cas (%)	FF	FF as % of Cas	Total In box	Cas	Cas (%)	FF	FF as % of Cas
1-Sqd	UCS	18	1	6%	0	0%	2	2	100%		
2-Sqd	UAtk	18	10	56%	1	10%	5	1	20%		
3-Sqd	J	13	8	62%	1	13%	4	4	100%		
4-Sqd	J	13	3	23%	0	0%	4	4	100%		
5-Sqd	UCS	18	5	28%	0	0%	2	2	100%		
6-Sqd	UAtk	18	7	39%	2	29%	5	4	80%		
7-Plt	UAtk	51	21	41%	5	24%	14	10	71%		
Total		**149**	**55**	**37%**	**9**	**16%**	**36**	**27**	**75%**		

EXPERIMENT EVENTS CASUALTY SUMMARY

		BLUFOR					OPFOR				
Event	Type	Total In box	Cas	Cas (%)	FF	FF as % of Cas	Total In box	Cas	Cas (%)	FF	FF as % of Cas
1-Sqd	UCS	15	0	0%			2	1	50%		
2-Sqd	UAtk	14	6	43%			4	4	100%		
3-Sqd	J	12	0	0%			4	3	75%		
4-Sqd	J	10	2	20%			3	3	100%		
5-Sqd	UCS	16	1	6%			2	1	50%		
6-Sqd	UAtk	16	11	69%			4	3	75%		
7-Sqd	UAtk	14	9	64%			4	3	75%		
8-Sqd	J	11	3	27%			3	3	100%		
9-Sqd	UCS	18	0	0%			2	2	100%		
10-Sqd	NUP	14	4	29%	1	25%	4	2	50%		
11-Sqd	NUP	20	5	25%	1	20%	6	2	30%		
12-Sqd	NUP	13	0	0%			1	1	100%		
13-Plt	UP	48	1	2%			14	5	36%	3	
14-Plt	NUP	57	7	12%	5	71%	2	2	100%		

EXPERIMENT EVENTS CASUALTY SUMMARY											
		BLUFOR					OPFOR				
Event	Type	Total In box	Cas	Cas (%)	FF	FF as % of Cas	Total In box	Cas	Cas (%)	FF	FF as % of Cas
15-Plt	JA	39	18	46%	9	50%	11	11	100%		
16-Plt	UAtk	45	17	38%	1	6%	14	7	50%		
17-Plt	UDef	45	3	7%			14	14	100%		
Total		**407**	**87**	**21%**	**17**	**20%**	**94**	**67**	**71%**	**3**	

SAM / TL EFFECTIVENESS FOR ALL EXPERIMENT EVENTS										
		OPFOR			BLUFOR					
Event	Type	Total In Box	Cas	Cas (%)	KIAs by SAM or TL	KIAs by SAM or TL (%)	SAM or TL Cas	SAM or TL as % of Cas	No FF Cas	FF as % of Cas
1-Sqd	UCS	2	1	50%	1					
2-Sqd	UAtk	4	4	100%	1	25%				
3-Sqd	J	4	3	75%	3	100%				
4-Sqd	J	3	3	100%						
5-Sqd	UCS	2	1	50%			1	100%		
6-Sqd	UAtk	4	3	75%	1	33%				
7-Sqd	UAtk	4	3	75%			1	11%		
8-Sqd	J	3	3	100%						
9-Sqd	UCS	2	2	100%	1	50%				
10-Sqd	NUP	4	2	50%					1	25%
11-Sqd	NUP	6	2	30%			1	20%	1	20%
12-Sqd	NUP	1	1	100%						
13-Plt	UP	14	5	36%	1	20%				
14-Plt	NUP	2	2	100%					5	71%
15-Plt	JA	11	11	100%	3	27%	4	22%	9	50%
16-Plt	UAtk	14	7	50%					1	6%
17-Plt	UDef	14	14	100%	5	36%				
Total		**94**	**67**	**71%**	**16**	**24%**	**7**	**8%**	**17**	**25%**

SAM or Team Leaders with optics accounted for 24% of overall OPFOR casualties.
SAM or Team Leaders with optics accounted for 8% of overall BLUFOR casualties.

Annex G – End of Experiment Questionnaire Summary

After Action Review Results. At the end of the experiment phase, an *After Action Review* was conducted in the AAFB Theater to gather final comments—in writing—from the leaders and SAMs. Here is a summary of their comments gleaned from the final questionnaires. It is question – response format.

1. *Question:*
   - What is the greatest value for having the optic?

   Response:
   - Most stated that the greatest value the optic provides is accurate target ID

2. *Question:*
   - What is the greatest of the SAM?

   Response:
   - Most stated the greatest value of the SAM is providing SA to the unit and positive ID

3. *Question:*
   - Where is the best location for SAM during movement, attack and consolidation?

   Response.
   - Movement – overwatch.
   - Attack – overwatch or base of fire.
   - Consolidation – covering avenues of approach

4. *Question:*
   - Who should the SAM should be teamed with during movement, attack and consolidation?

   Response:
   - Movement – Fire team leader
   - Attack – Fire team leader
   - Consolidation – fire team leader

5. *Question:*
   - How important is it for the SAM to have communication?

   Response:
   - Very important.

6. *Question:*
   - Who should have an optic (other than the SAM)?

   Response:
   - Five (5) of seven (7) members of the platoon felt that <u>all</u> leaders should have one.

7. *Question:*
   - How long would it take to train a Marine to use the optic?

   Response:

- Most felt that the average Marine could learn to use the optic in three (3) to five (5) days.

8. *Question:*
   - How many training days should a Marine have to become familiar with being a SAM?

   Response:
   - Responses varied from less than three (3) days to as much as fourteen (14) days.
   - ProMet SMEs felt that it would take about ten (10) days.

9. *Question:*
   - What is the recommended distribution for the optic in the infantry platoon?

   Response:
   - All said that the optic should be at the fire team level, IF you could not give everybody one.

10. *Question:*
    - Who should be trained as a SAM in the infantry platoon?

    Response:
    - Most felt that everyone should be trained to be the SAM in case the SAM became a casualty.

11. *Question:*
    - What are the prerequisites for being a SAM?

    Response:
    - The most common response was, that he had to have common sense.
    - The other suggested prerequisites were – good marksmanship and general military skills.

12. *Question:*
    - Is the SAM concept a good idea?

    Response:
    - All personnel stated that they thought the SAM concept was valid.

13. *Question:*
    - Rate how useful the optic aided in target ID.

    Response:
    - All rated the optic as OUTSTANDING.

14. *Question:*
    - Rate how valuable the bipod was in assisting in target engagement.

    Response:
    - All but one rated the bipod as OUTSTANDING; the one rated it as IMPORTANT.

15. *Question:*
    - Was the 4X magnification adequate?

    Response:
    - All rated the magnification as adequate.

16. Question:

- What other equipment should the SAM have?

Response.

- The two most common responses were – communication and a ladder.

There were two additional questions asked relative to the experiment that were not part of the SAM evaluation. The results of those are:

17. Question:

- Is satelliting a good technique to use in the urban area?

Response:

- All responded that they thought it was a good technique to use.

18. Question:

- What do you think of ASTA as a training area for urban and/or jungle?

Response:

- Urban training:
  - Statements included adjectives such as - awesome, great, best I have seen, very good.
- Jungle training:
  - Statements included adjectives such as – great, very good, not too bad, sub par.

Post Event Questionnaires. Here are the responses to the questionnaire responses filled out by participants after every event.

Legend

PC - Platoon Commander
PS - Platoon Sergeant
1st - 1st Squad Leader
2nd - 2nd Squad Leader
3rd - 3rd Squad Leader
W - Sergeant 3rd Squad Leader (assigned squad leader for experiment)
S - Corporal 3rd Squad Leader (normal squad leader)

1a. What was the greatest value of the optic?	
Platoon Commander	Accurate target ID
Platoon Sergeant	Target ID
1st Squad Leader	Better view of targets, windows, doors, shadows.
2nd Squad Leader	Viewing down avenues of approach/overwatch for rest of squad. Better eyes on. SA/positive ID
3rd Squad leader (Sgt)	Better view of objective.
3rd Squad Leader (Cpl)	ID individuals you might not be able to do with the naked eye

1b. What was the greatest value of the SAM?	
Platoon Commander	Greater SA for unit and thus better, faster reaction to enemy.
Platoon Sergeant	Stable shooting position.
1st Squad Leader	Positive ID of targets.
2nd Squad Leader	Providing overwatch/SA/covering movement while patrolling.
3rd Squad leader (Sgt)	Positive ID on targets.
3rd Squad Leader (Cpl)	Confident that the SAM has movement covered in overwatch.

2a. Where was the best place for the SAM during movement?	
Platoon Commander	Overwatch or lead element.
Platoon Sergeant	Overwatch.
1st Squad Leader	2nd in each fire team, overwatch.
2nd Squad Leader	2nd man first team while patrolling/overwatch/SA.
3rd Squad leader (Sgt)	2nd in fire team.
3rd Squad Leader (Cpl)	Point/2nd in movement/overwatch.

2b. Where was the best place for the SAM during attack?	
Platoon Commander	Overwatch for subordinate units.
Platoon Sergeant	SBF.
1st Squad Leader	Rooftops or building corners.
2nd Squad Leader	Overwatch/positive ID/SA/base of fire.
3rd Squad leader (Sgt)	Where the best overwatch position IS.
3rd Squad Leader (Cpl)	Base of fire position.

2c. Where was the best place for the SAM during consolidation?	
Platoon Commander	Avenues of approach/with SAW.
Platoon Sergeant	Overwatch, avenues of approach.
1st Squad Leader	Anywhere.
2nd Squad Leader	Covering avenues of approach/better eyes on/SA.
3rd Squad leader (Sgt)	
3rd Squad Leader (Cpl)	Covering avenue of approach with AR.

2d. Where was the best place for the SAM during ambush?	
Platoon Commander	EW, eng crit (lead, trace, radio, etc.).
Platoon Sergeant	AA.
1st Squad Leader	On the outer flanks/avenues of approach.
2nd Squad Leader	On the flanks and center to inform how many/early warning/have designated targets/covering EPW search teams.
3rd Squad leader (Sgt)	
3rd Squad Leader (Cpl)	Placed where he can observe the whole ambush site.

3a. Who should the SAM be teamed with during movement?	
Platoon Commander	Fire team leader.
Platoon Sergeant	Fire team leader.
1st Squad Leader	Fire team leader.

3a. Who should the SAM be teamed with during movement?	
2nd Squad Leader	Fire team leader.
3rd Squad leader (Sgt)	Squad leader.
3rd Squad Leader (Cpl)	Fire team leader.

3b. Who should the SAM be teamed with during attack?	
Platoon Commander	Fire team leader.
Platoon Sergeant	Fire team leader.
1st Squad Leader	Fire team leader or automatic rifleman.
2nd Squad Leader	Fire team leader.
3rd Squad leader (Sgt)	Fire team leader or automatic rifleman
3rd Squad Leader (Cpl)	Fire team leader or automatic rifleman.

3c. Who should the SAM be teamed with during consolidation?	
Platoon Commander	Fire team leader.
Platoon Sergeant	Fire team leader.
1st Squad Leader	Fire team leader.
2nd Squad Leader	Fire team leader.
3rd Squad leader (Sgt)	Squad leader.
3rd Squad Leader (Cpl)	Fire team leader.

3d. Who should the SAM be teamed with during ambush?	
Platoon Commander	Fire team leader.
Platoon Sergeant	Fire team leader.
1st Squad Leader	Fire team leader.
2nd Squad Leader	Fire team leader.
3rd Squad leader (Sgt)	Squad leader.
3rd Squad Leader (Cpl)	Fire team.

4. How important is it for the SAM to have Communication?					
	Useless	**Not Useful**	**Important**		**Very Important**
	1	**2**	**3**	**4**	**5**
Platoon Commander					X
Platoon Sergeant					X
1st Squad Leader					X
2nd Squad Leader					X
3rd Squad leader (Sgt)					X
3rd Squad Leader (Cpl)					X
Platoon Commander					X

5. Who should have an optic?				
	Platoon Commander	**Squad Leader**	**Team Leader**	**Others**
Platoon Commander	Yes	Yes	Yes	
Platoon Sergeant	Yes	Yes	Yes	
1st Squad Leader	Yes	Yes	Yes	All
2nd Squad Leader	No	No	No	SAW
3rd Squad leader (Sgt)	Yes	Yes	Yes	All
3rd Squad Leader (Cpl)	No	No	No	AAR

6. How long would it take to train a Marine to use the optic?	
Platoon Commander	Five (5) to six (6) days.
Platoon Sergeant	No response.
1st Squad Leader	Accurately: one (1) day books and three (3) days PracAp.
2nd Squad Leader	No response.
3rd Squad leader (Sgt)	To have a good concept of the SAM: Two (2) months.
3rd Squad Leader (Cpl)	Three (3) to five (5) days.

7. How many training days for a Marine to become familiar with being a SAM?	
Platoon Commander	Five (5) to six (6) days.
Platoon Sergeant	Ten (10) to fourteen (14) days.
1st Squad Leader	Less than three (3) days.
2nd Squad Leader	No response.
3rd Squad leader (Sgt)	Seven (7) days.
3rd Squad Leader (Cpl)	Three (3) to five (5) days.

8. How many training days for a Marine to become proficient with being a SAM?	
Platoon Commander	Two (2) to three (3) days.
Platoon Sergeant	All depends on unit training.
1st Squad Leader	Depending on how well they learn (15) days.
2nd Squad Leader	No response.
3rd Squad leader (Sgt)	Two (2) weeks.
3rd Squad Leader (Cpl)	Six (6) days.

9. What is the recommended distribution for the optic in the infantry platoon?	
Platoon Commander	One (1) per fire team.
Platoon Sergeant	One (1) per fire team or buy one for everyone.
1st Squad Leader	All around.
2nd Squad Leader	No response.
3rd Squad leader (Sgt)	One (1) per team..
3rd Squad Leader (Cpl)	No response.

10. Who should be trained as a SAM in the infantry platoon?	
Platoon Commander	No response.
Platoon Sergeant	Rifleman.
1st Squad Leader	Possibly every Marine.
2nd Squad Leader	Everyone, but only have one SAM per fire team.
3rd Squad leader (Sgt)	All leadership billets so they know the best way to use it.
3rd Squad Leader (Cpl)	Everybody.

11. What, if any, are the prerequisites for being a SAM?	
Platoon Commander	Have common sense, >30 on KD/Sharpshooter.
Platoon Sergeant	Someone with G2.
1st Squad Leader	Good marksman, patient, common sense.
2nd Squad Leader	G2, be tactically sound.
3rd Squad leader (Sgt)	Good map reading skills, good communication skills.
3rd Squad Leader (Cpl)	No response.

12. Is the SAM concept a good idea?			
	Yes	**No**	**Remarks**
Platoon Commander	X		
Platoon Sergeant	X		It enhances the squad's combat power.
1st Squad Leader	X		
2nd Squad Leader	X		
3rd Squad leader (Sgt)	X		But we need more SAM Marines in squad
3rd Squad Leader (Cpl)	X		

13. Rate how useful the optic is for in target ID; e.g., friend from foe, noncombatants from enemy					
	Useless	**Not Useful**	**Useful**	**Excellent**	**Outstanding**
	1	**2**	**3**	**4**	**5**
Platoon Commander					X
Platoon Sergeant					X
1st Squad Leader					X
2nd Squad Leader					X
3rd Squad leader (Sgt)					X
3rd Squad Leader (Cpl)					X
Platoon Commander					X

14. How valuable was the bipod—in live fire training—in assisting accurate target engagement?					
	Useless	**Not Useful**	**Useful**	**Excellent**	**Outstanding**
	1	**2**	**3**	**4**	**5**
Platoon Commander					X
Platoon Sergeant					X
1st Squad Leader					X
2nd Squad Leader					X
3rd Squad leader (Sgt)					X
3rd Squad Leader (Cpl)					X
Platoon Commander					X

15. Do you think the optic's magnification is adequate?					
	Useless	**Not Useful**	**Useful**	**Excellent**	**Outstanding**
	1	**2**	**3**	**4**	**5**
Platoon Commander					X
Platoon Sergeant					X
1st Squad Leader					X
2nd Squad Leader					X
3rd Squad leader (Sgt)					X
3rd Squad Leader (Cpl)					X
Platoon Commander					X

16. Is there any other equipment the SAM should have to do his job?	
Platoon Commander	Communication; a night vision device that attaches to optic.
Platoon Sergeant	Communication; a ladder.
1st Squad Leader	No response
2nd Squad Leader	A ladder; communication.
3rd Squad leader (Sgt)	No response
3rd Squad Leader (Cpl)	No response

Other questions.

1. Do you think satelliting is a good technique to use in the urban area?	
Platoon Commander	Yes.
Platoon Sergeant	Yes. This is a new technique but it allowed the Marines to shoot, move and communicate and also does not give the enemy and accurate account o moving elements.
1st Squad Leader	Yes. If you have good comm. between teams and squads its easy and you cover more ground.
2nd Squad Leader	Yes.
3rd Squad leader (Sgt)	Yes. But if we don't have comm., it is hard to control.
3rd Squad Leader (Cpl)	Yes.

2a. What do you think of ASTA as a training area for MOUT?	
Platoon Commander	Awesome! Eventually will need to replace windows and doors.
Platoon Sergeant	The area was very good because it had different structures and layouts so it kept you on your toes and it changes the scenario very often.
1st Squad Leader	Great. Best I have seen.
2nd Squad Leader	Outstanding (needs furniture/cars/civilians).
3rd Squad leader (Sgt)	Good. Has very thick vegetation, but building structure was good.
3rd Squad Leader (Cpl)	Great.

2b. What do you think of ASTA as a training area for Jungle operations?	
Platoon Commander	Sub-par. Other than trails, almost no-go terrain (ambush sites were all that I visited).
Platoon Sergeant	The entire area was sound and it is worth to train in a different environments.
1st Squad Leader	Not too bad, I guess.
2nd Squad Leader	Change of pace.
3rd Squad leader (Sgt)	Very good.
3rd Squad Leader (Cpl)	Great.

Annex H – Andersen Logistics Brief

Prior to conducting any training aboard Andersen Air Force Base (AAFB), you should contact 36th Operational Support Squadron (36th OSS). They will provide you with a training requirement checklist and assign a Logistics Liaison to your unit to help coordinate all training requirements and provide you with the appropriate documentation to be submitted. The liaison will schedule meetings with all entities involved such as:

1. **Contracting**. Contracting will assign a cardholder who will be responsible for all purchases conducted on and off base. Monies will be sent to the AFB Comptroller via Military Interdepartmental Purchase Request (MIPR) and will be directed to the cardholder's account. This will cover:
    a. Billeting.
    b. Purchases such as water, cell phones, vehicle rentals or any other training requirement that cannot be accommodated on base.
2. **Civil Engineering (CE)**. They handle contracts such as port-a-potties, dumpsters, and fees involved with the use of space on base such as utilities.
3. **Ammo Supply Point (ASP).** Establish a courtesy storage agreement with ASP (Exhibit 2).
    a. The Air Force ASP provides a storage facility only. All other ammunition perspectives are the unit's responsibility.
    b. Ammo arrives and is delivered by the Naval Base.
    (1) The standing POC is Mr. Larry Clap.
4. **Rifle Range.** Submit an Entry Authorization List (Exhibit 3) to the Range SNCOIC on Andersen AFB. This will be used for:
    a. Access to the armory, located at building _____which will house all weapons
    b. Scheduling of the range.
5. **Medical Facilities**. There is a medical clinic aboard Andersen AFB that can deal with minor problems. Emergencies are coordinated through the island 911-telephone system. In the event a medical evacuation is needed, the island dispatch system will coordinate who conducts the evacuation.
    a. Both the Coast Guard and HC-5 have aircraft available to assist in the event of a life-threatening situation.
6. **Communications.** Frequency management issues are resolved by 3rd Marine Division (or other parent unit) prior to the arrival of the training unit.

Andersen South Training Area (ASTA).

1. ASTA is roughly a 1500-acre parcel of land, south of AAFB. It is an abandoned housing area that includes about 240 houses/apartments and six large, three-story barracks buildings. ASTA was previously controlled by the Air Force but is being turned over to the Marine Corps. MCB Butler has been designated as the site manager and should be contacted for scheduling. MCB Butler has a site manager, Ed Batanga, on Guam to assist units in conducting training.
2. The MOUT portion of Andersen South is shown on map on the next page. The MOUT area can be separated into three training areas (TAs). Buildings in areas B, C and E are single family, simple buildings. Area D, F and G are made up of one and two story multiple family style homes. Area A is the area with 6 large multi-story complex buildings.

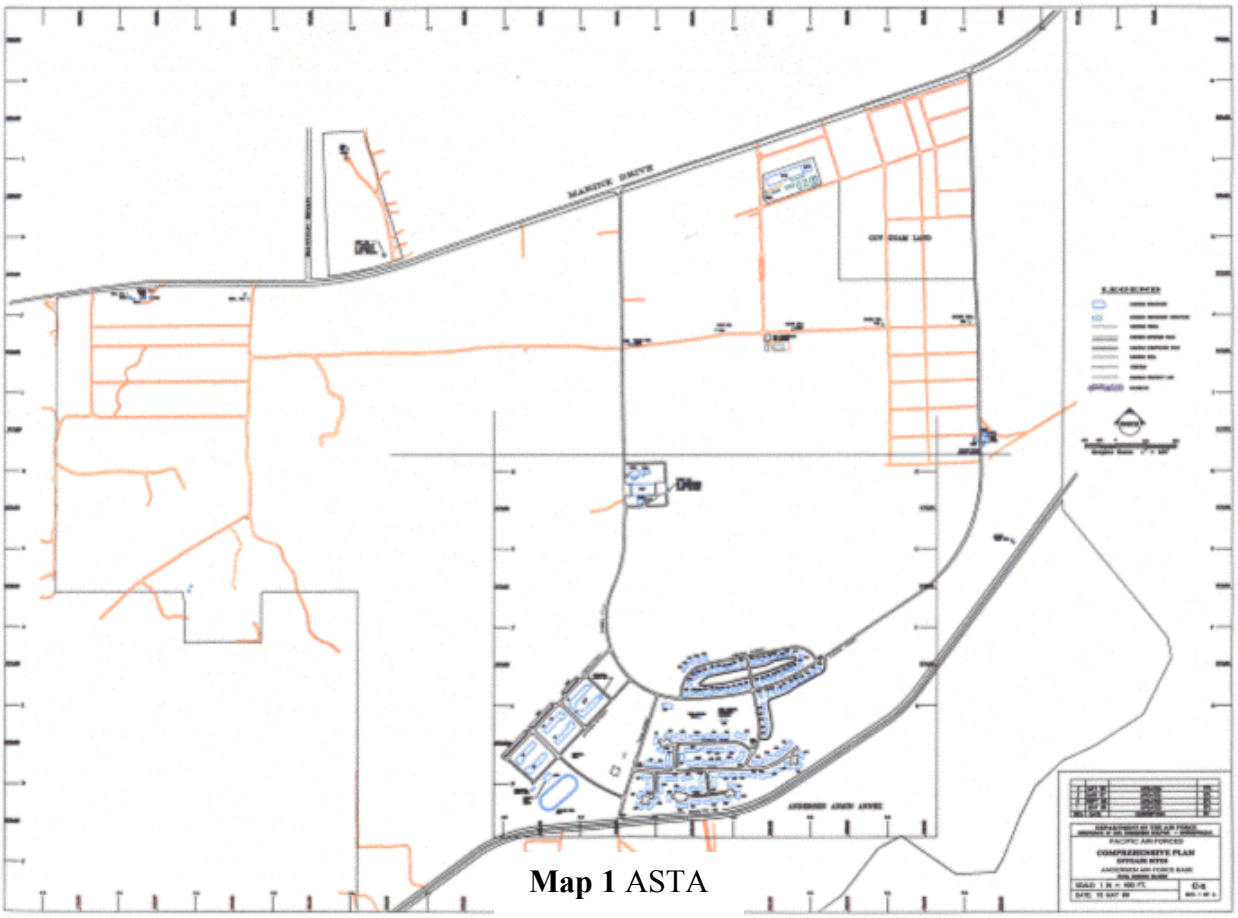
3. The single story buildings are ideally suited for introductory MOUT training. The two story buildings in areas D, F and G are well suited for more advanced MOUT training. There are three styles of two story structures: two with outside stairs and one with internal stairs. The ones with external stairs (shown in the photo at the right) have multiple apartments stacked on top of each other. The ones with internal stairs are two story apartments.

4. Area A is an area composed of six large three story complex buildings of generally the same configuration. These buildings have both internal and external stairwells. The photo at the left shows one of these buildings/

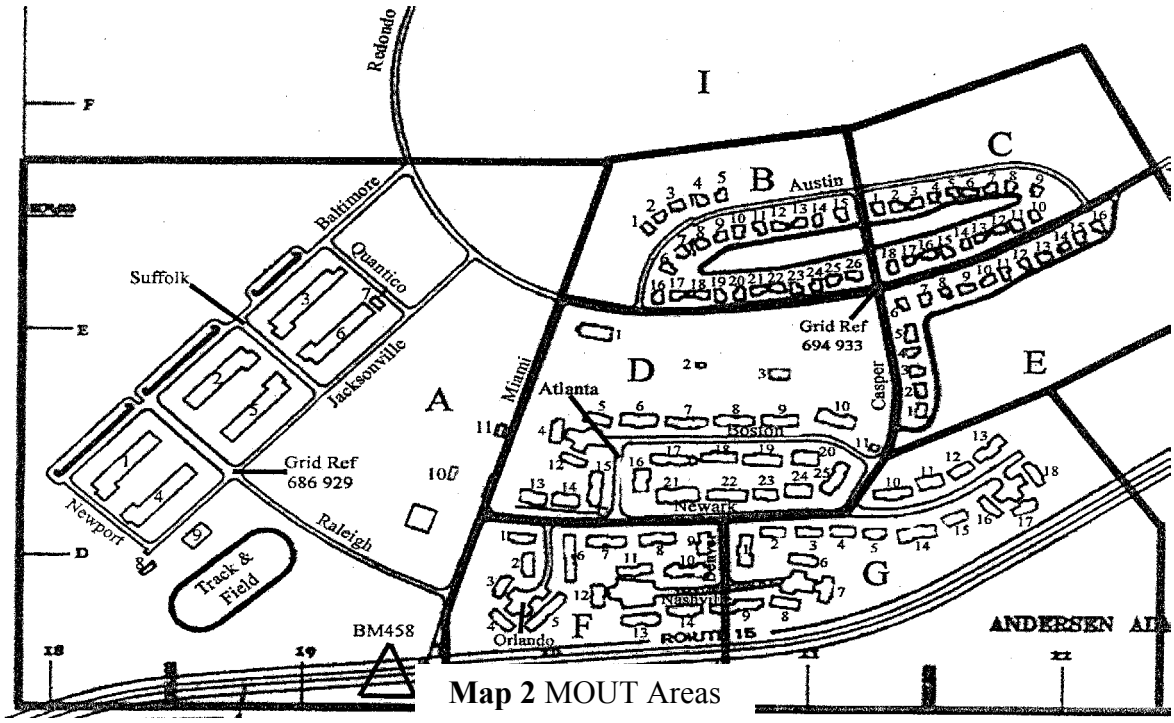
5. The Community Center is located at the intersection of Miami and Redondo in area D. This former recreation center has two large rooms as well as offices. This building was originally going to be used as the range control office/ administrative command center and Battalion Aid Station (BAS). However, to enhance the training value of keeping the entire area "in-play" you should locate the administrative building outside the site. The large warehouse located to the North of the "play box" is the preferred administrative area.

Non-MOUT Training Areas. The built up areas comprise about 400-500 acres. There are numerous suitable landing zones and other areas that could be used for other training, such as, patrolling, land navigation, etc. The maneuver areas consist of primarily "secondary growth." This is thick bush-like growth that reaches a height of about eight feet. The terrain is generally flat with micro-terrain. The roads are paved, two lane, and light duty. The sub- terrain is coral. Digging fighting positions without major effort is impractical and is not envisioned.

Facilities. ASTA does not have electricity, head facilities, or water. ProMet used a portable generator, bottled water, and contracted porta-jons and dumpsters. An eight-foot concrete fence bounds the southern edge of the housing area. Two hard surface roads enter ASTA. Each has a large chain link gate that can be secured. ProMet used the western gate and access road because the eastern road (entrance adjacent to the fire station) is used frequently by civilians for walking and running. The western access road is adjacent to the large warehouse that ProMet recommends as the future administrative site. This very large warehouse is well outside the MOUT training area but centered in the overall site. It is the closest building to existing electricity and water.



Map 1 ASTA



Map 2 MOUT Areas

Key Documents for Guam Operations

POCs for Ops in Guam

Department	Area	POC	Phone Number
COMNAVMAR (Navy)			
Medical	Immunization Clinic	Petty Officer Lee	671-635-5656 (pager) 671-344-9444
Transportation	Dispatcher	Larry Naputi	688-1655
ASP	Ammunition	Julia Roberto	339-5115
		Larry Clap	333-2140
DRMO	DRMO	Mr. Camacho	339-4058
Sea Bees	HMMWV	Chief Hair	339-5244
Naval Contracting		Lt (jg) Cook	339-7070
Navy	Ops	Lt Mike Brady	671-339-4157
Army National Guard	Motor Pool	Spc Fernandez	647-2838 Cell 888-3016
	Vehicles	Capt Perez	734-4553
III MEF AMMO			
Sasebo, Japan	Ammo	CWO3 Marchand	DSN: 252-5530
III MEF HQ	Ammo	Capt Gonzalez	
Miles 2000 Contractor		Bob Brock	321-231-2602
Guam National Guard			
HMMWVs	Ops	Maj Legaspi	671-647-6022
		WO Davis	671-647-2729
Operations Command		Capt Delphin	671-647-2713
	Motor Pool	SFC Fernandez	647-2838
Army National Guard	Vehicles	Capt Perez	734-4553
MCB Butler			
MCB Butler	Range Safety (ASTA)	CWO3 Cole	DSN: 623-4823
	ASTA Project Mgr	LtCol Moore	DSN: 645-7221
Range Control	ASTA	Ed Batanga	777-6969/687-6210/734-1637
Andersen AFB			
Commanding Officer:	36th Air Base Wing	Colonel Joseph F. Mudd	Unit 14003 APO AP 96543-4003
Medical	Immunization Clinic	SSgt Hunter	671-366-2873/8220
		SSgt Alexander	
Intelligence		Lt Gookins	671-366-1307
		Capt Lyons	
36 OSS	Logistics Liaison	SSgt Guzman	366-3291
	Andersen South	Capt Conseldane	366-3291
Ranges	Andersen Rifle Range	TSgt Breitegan	366-2254
Billeting	Andersen Lodging	Pat Patterson	362-2804
ASP	MS1	SMSgt Torelli	366-7278
	MS1	SSgt Knight	366-6393/6300
Civil Engineering	Maintenance	Barbara Guerrero	366-5061
	Dumpsters	Mr. Shaft	366-3559

POCs for Ops in Guam

Department	Area	POC	Phone Number
	Porta Potties	Vic	472-5596
TMO	Trends Western	Greg	366-3872
Freight	Forklift/Shipments/Bad Attd.	Jessica	366-2800
Chow	Dining Facility	MSgt Smith	366-5201
		SSgt McAfee	366-2195
Law Enforcement	Armory Admittance/ASP		366-2910
	Flight Armory		366-3110
Telephone	Morale Call	MSgt Cotera	366-2774
Finance	Comptroller	MSgt Sommers	366-1234
	Contracting	SSgt Warner	366-3004
Fuel	Fuel Keys	Mr. Peredo	653-9050
	Fuel Farm	SSgt Worrall	366-6291
Communications	ISMO	TSgt Gorden	366-4622
Weather	Weather Report	MSgt Vandenheyvel	366-5230
Audio Visual	Equipment	TSgt Brown	366-2228/2666
Protocol	VIP's		366-1320
Airfield Operations	Base Ops Center	Bldg 17002	366-5212
Tropic Topic	Base News Paper	Airman Strang	366-4202
Coast Guard	Emergency Line		671-339-6100
	General Line		671-339-2001
HC-5 (Helicopter)	Scheduling	Lt Sean Dark	671-366-6419
	Quarterdeck		671-366-6410

Exhibit 1 Arrival/Departure Checklist

Receptions Checklist	Please be thorough in reviewing/completing this checklist. The support requested below is what we will try our best to support. If it is not on the checklist—you will not get that support!

Concept of Operations	**The Marine Corps Warfighting Laboratory from Quantico, Virginia will conduct an Urban Warfare Experiment in the Anderson South Training Area and at COMNAVMAR in September, October, and November 2002. The experiment is the second in a series of experiments titled Tactical Warrior (TACWAR) and the tactical focus is on developing tactics, techniques and procedures for the Squad Advanced Marksmanship program.**

Unit: Project Metropolis, Marine Corps Warfighting Laboratory, Quantico, Virginia	**Dates: 30 September – 2 November**
LOG POC/DSN: Mr. David Bedworth. 278-0322	**OPS POC/DSN: Captain Joe Tamminen, 278-1077**
Email: bedworthd@mcwl.Quantico.usmc.mil	**Email: tamminenjc@mcwl.usmc.mil**

Action/ Event	Insert data in blocks below. Identify Advon Aircraft with Red Font							
Aircraft	**No.**	**AC Type**	**Arrival Date**	**Depart Date**	**Quantity**	**AC Type**	**Arrival Date**	**Depart Date**
Action/ Event	Identify download/upload support required. Identify pallets needing special handling in red font							
Airlift	**AC Type**	**Arrive Date**	**Depart Date**	**Pallet Posit**	**AC Type**	**Arrive Date**	**Departure Date**	**Pallet Posit**
	Provide a short description of pallets needing special handling							

Action/ Event	Insert data in blocks below. Identify Advon Personnel with Red Font								
Personnel	**#**	**Arrive dd mo**	**Depart dd mo**	**#**	**Arrive dd mo**	**Depart dd mo**	**#**	**Arrive dd mo**	**Depart dd mo**
	3	**15 Sep**	**2 Nov**	**4**	**22 Sep**	**2 Nov**	**3**	**24 Sep**	**2 Nov**
	5	**26 Sep**	**2 Nov**	**22**	**27 Sep**	**2 Nov**	**1**	**30 Sep**	**2 Nov**
	63	**7 Oct**	**2 Nov**	**1**	**10 Oct**	**2 Nov**	**1**	**24 Oct**	**2 Nov**

ACTION/EVENT	Identify Dates (dd-mo – dd mo) & Personnel numbers requesting each location			
Training Fields	Andy South Dates	Andy South Personnel	NW Field Dates	NW Field Personnel
	30 Sept – 2 Nov	100	30 Sep – 9 Oct	20
	Identify Training objectives below			
Andy South	Conduct Basic Urban Skills Training and Squad Advanced Marksman Experiment			
Rifle Range	Conduct Unknown Distance shooting for Squad Advanced Marksman training			

ACTION/ EVENT	Insert the number of personnel needing billeting & the dates the rooms are needed				
Billeting	**Dates dd-mo–dd-mo**	Officer Rooms	**Enlisted Rooms**	**0-6+**	**E-9s**
	15 Sep – 1 Nov	**0**	**3**		
	22 Sep - 1 Nov	**2**	**2**		
	24 Sep – 1 Nov	**0**	**3**		
	26 Sep- 1 Nov	**2**	**3**		
	27 Sep – 1 Nov	**1**	**22**		
	30 Sep 1 Nov	**1**	**0**		
	11 Oct – 1 Nov	**6**	**56**		
	7 Oct – 1 Nov	**1**	**0**		
	10 Oct – 1 Nov	**0**	**1**		
	26 Oct – 1 Nov	**1**			

ACTION/EVENT	Insert Requirements for Magellan Dining Facility & Ground/Flight/MRE meals needed					
Magellan Dining & Food Services See dates above in Billeting Section	**Breakfast: 0500-0800 # Expected**	**Lunch: 1100-1300 # Expected**	**Dinner: 1630-1930 # Expected**	**# of Ground Meals needed ($3.25)**	**# of Flight Meals needed ($2.70)**	# of MREs needed **($3.25)**
	103		103			103

ACTION/ EVENT	Identify the facilities & amount of rooms needed for your operations center

Facilities	**One office (30'x30') with five desks and conference table** **One classroom to seat 100 with training and audio-visual support capability**
	Identify the facilities & amount of rooms needed for your maintenance operations
	Identify what aircraft/quantities of aircraft need hangar space

ACTION/ EVENT	Insert the number of AGE/GSE equipment needed below							
AGE/GSE								

ACTION/ EVENT	Insert the number of Material Handling Equipment needed for support below						
MHE	**6K Forklift**	**10K Forklift**	10K AT Forklift	5 Ton Tractor	7.5 Ton Tractor	25 Ft Trailer	40 Ft Trailer
	For Ammo						

ACTION/ EVENT	Insert number of vehicles needed for support below							
Vehicles	**3 Pax Truck**	**6 Pax Truck**	**¼ Ton Truck**	**½ Ton Truck**	**1 Ton Truck**	**7 Pax Van**	**9 Pax Van**	
					1			
	15 Pax Van	**16 Pax Bus**	**28 Pax Bus**	**44 Pax Bus**	**Jeep**	**Station Wagon**	**Flatbed**	**Metro/Bread Truck**
	5	**5**			**2**			

ACTION/ EVENT	**Insert munitions type & quantities required for support below**					
Munitions	**Type**	**Quantity**	**Type**	**Quantity**	**Type**	**Quantity**
	A059	**50700**	**A080**	**5000**	**AA21**	**45000**
	A075	**14000**	**AA12**	**30000**	**G878**	**2400**
	G930	**60**	**G940**	**24**	**G945**	**24**
	G955	**24**	**L312**	**150**	**L367**	**200**
	L598	**95**	**L602**	**100**	**Linked Simms**	**15000**
	Insert Download/Upload support Required					
	All Ammunition will come from Navy Ordnance. Request an ammunition					

	storage bunker be provided from 29 September to 1 November. It is intended that Marine personnel will draw ammunition from the bunker each day as required to support the training/experiment schedule
	Insert building/delivering Support Required
	Per above request, an ammunition storage bunker with a download upon delivery and an upload upon retrograde

Exhibit 2 Courtesy Storage Agreement

MEMORANDUM FOR 36 MXS/LGMW

FROM: Marine Corps Warfighting Laboratory

SUBJECT: Courtesy Storage Agreement for Marine Corps Warfighting Lab (MCWL)

1. We request courtesy storage space in building (We will fill this in) to store our munitions listed in the table below. This letter constitutes a formal agreement between our organization and the 36th Maintenance Squadron. Additionally, procedures and responsibilities outlined in PACAFI 21-201 must be adhered to. In the event operational requirements dictate, 36 MXS/LGMW reserves the right to utilize these facilities to temporarily store munitions assets, with prior notification to **MCWL**.

National Stock Number	Nomenclature	Hazard Class Division/CIC	Maximum Quantity
1305011555469	CTG, 5.56mm, BALL, M855	1.4S	55000
1370002839443	SIMULATOR, FLASH, BOOBY TRAP	1.3G	100
1305001823217	CTG, 5.56mm, BLANK	1.4S	5000
1305010784879	CTG, Cal .50, BLANK, LINKED	1.4C	5600
1330001788515	GRENADE, HAND PRACTICE BODY	INT	200
1370010852601	SIMULATOR, AT GM AND RKT, M72 (ATWSS)	1.3G	200
1305011555464	CTG 5.56MM BLANK, LINKED	1.4S	14000
1305014242401	SESAMS, RED	1.4S	30000
1305014493208	SESAMS, BLUE	1.4S	45000
1330001685502	FUZE DELAY, F/G811 PRAC GREEN	1.4B	2400
1330001713112	GRENADE, HAND, SMOKE, TA M83	1.4G	60
1330002896851	GRENADE, HAND, SMOKE, GREEN	1.4G	24
1330002896854	GRENADE, HAND, SMOKE, YELLOW	1.4G	24
1330002896853	GRENADE, HAND, SMOKE, VIOLET	1.4G	24

1370007531859	SIGNAL, WHITE STAR PARACHUTE	1.3G	150
1370010341397	SIMULATOR, FLASH, ARTY, M21	1.3G	100
No NSN (EXPERIMENTAL)	LINKED GREEN SESAMS	1.4S	15000

2. Specific items covered by this agreement are munitions items issued to our section for mobility and training.

3. The following restrictions/responsibilities apply:
   a. **RESPONSIBILITIES:**
   (1) 36 **MXS/LGMW:**
      (a) Provide storage space.
      (b) Provide escorts to access courtesy stored munitions.
      (c) Provide technical assistance upon request.
      (d) Munitions Control will schedule lock maintenance with Munitions Storage and Handling.
      (e) Comply with AFI 21-201, AFMAN 91-201, and item technical orders regarding the proper storage and identification of courtesy stored munitions. Responsibilities include, but are not limited to, posting applicable fire symbol/hazard markers, housekeeping, assigning proper storage locations, monitoring N.E.W. limits, and notifying Munitions Control (366-6393/4) of any fire symbol/hazard marker or Controlled Item Code (CIC) changes.
      (f) Repairing packing discrepancies caused by storage conditions.
   (2) **Owning Organization: MCWL:**
      (a) Provide personnel, handling equipment, and transport vehicles required for transporting munitions items within, to, and from courtesy storage location.
      (b) Comply with the requirements specified in AFMAN 91-201 regarding transport vehicles and transportation of munitions.
      (c) Non-DoD owned explosives and other hazardous and toxic materials will not be stored in the MSA. Refer to AFI-21-201 and AFMAN 91-201 for guidance.
      (d) Technical data for non-USAF materials must be provided by the owning organization, prior to storage.
      (e) Owning organization will be responsible for the care and preservation of munitions/materiel. Responsibilities include, but are not limited to, repairing packing, lot separation, and marking discrepancies resulting from use. Maintain munitions in original packaging I.A.W. "T.O." 11A1-10 for all issued munitions, except those in use.
      (f) Report any theft, suspected theft loss of destruction of a munitions item (other than fair wear and tear, authorized expenditure, installation or disposal), to the MASO and applicable authority.
      (g) Comply with requirements specified in AFMAN 91-201 regarding housekeeping.
      (h) Responsible for accounting and reporting supply point munitions.

4. **ANNUAL REVIEW:** This agreement is in effect for a period of 1 year from the approval date and will be reviewed each **October**.

5. **PERSONNEL AUTHORIZED ACCESS:** Only the personnel identified on the Entry Authorization List or in writing, by their respective commanders, are authorized access to courtesy stored munitions.

6. **ACCESS PROCEDURES:** Access to courtesy stored munitions will be on an escorted basis. Keys to munitions storage structures will not be issued to individuals from the using organization. Access to courtesy stored munitions is limited to normal duty hours, 0700-1600, Monday-Friday. To gain access, notify Munitions Control at 366-6393/4, 5 duty days prior to date/time requiring access. To support emergency mission requirements during after duty hours, contact the 36th ABW Command Post at 366-2981. The approximate after duty hours response time is 2 hours.

7. **INVENTORY MANAGEMENT:** All inventory and status reporting requirements remain the responsibility of the owning organization. All munitions movements must be tracked on a AF Form 4147 Munitions Movement Control Worksheet. All movements of assets will be reported to Munitions Storage and Handling Dispatch.

8. **FACILITY INSPECTIONS:** 36 MXS/LGMWMS (Storage and Handling section) will conduct random inspections on courtesy storage facilities for compliance with explosives safety and storage requirements (**NOTE**: as a courtesy 36 MXS personnel will attempt to contact the custodian prior to entering the facility). This inspection will ensure munitions are properly stored, the proper fire symbols are posted, and correct security measures are followed.
    a. Any questions concerning this Courtesy Storage Agreement may be directed to Munitions Storage Dispatch at 366-5166 or 366-4533.

Joseph C. Tamminen
Captain, USMC
Project Metropolis
Marine Corps Warfighting Laboratory

1st Ind: 36 MXS/LGMW

Approved/Disapproved

NEIL A. MAFNAS, 2Lt, USAF
Munitions Flight Commander

Exhibit 3 Entry Authorization List (EAL)

Date

MEMORANDUM FOR 36 MXS/LGMW

FROM: MCWL (PROJECT METROPOLIS)

SUBJECT: Entry Authorization List (EAL)

Request approval for the following personnel to enter the (MSA-1, MSA-2 and/or 9100) controlled area from (15 Sept 02) to (02 Nov 02). This EAL will be re-accomplished on a semi-annual basis. Personnel require access to the controlled areas to Personnel require access to the controlled areas to supervise, distribute and store the ammo which will be used to support TAC Warrior II.

RANK/NAME	**LAST SIX OF SSN**	**SEC CLEARANCE**
Last, First	XXXXXX	EX - Secret

2. Please direct any questions concerning this EAL to GySgt J.D. Foster, PRO MET Log Chief, MCWL, at (703) 784-3785.

Joseph C. Tamminen
Captain, USMC
Project Metropolis
Marine Corps Warfighting Laboratory

1st Ind, 36 MXS/LGMW
Approved/Disapproved

ROGER L. LANTRY, SMSgt, USAF
Munitions Flight Chief

THIS INFORMATION IS PROTECTED BY THE PRIVACY ACT OF 1974

Annex I – Communications Summary

AN/PRC-148 MBITR and Personal Role Radio (PRR) Headset Feedback Report

1. Quality of Training. Rate the training you received on the use of the radio.

Table 1. Quality of Training					
User ID	**Poor 1**	**Average 2**	**Excellent 3**	**Outstanding 4**	**Ways to Improve Training**
Platoon Leader MBITR		1			More practical application and Troubleshooting
Platoon Sergeant MBITR					
Squad Leader MBITR		2		2	
Platoon Leader PRR		1			
Platoon Sgt PRR			1		More detailed class on functions
Squad Leader PRR			3	1	Troubleshooting class
Fire Team Leader PRR		1	5		
SAM PRR		2	2	1	
Total: MBITR		**3/6**	**1/6**	**2/6**	
Total: PRR		**4/17**	**11/17**	**2/17**	

<u>Remarks:</u> Quality of Training.

- MBITR training was focused solely at the operator level. The class did not go in depth into the programming and troubleshooting of equipment. Hence, the Marines were able to operate the radio in a tactical environment but had difficulty troubleshooting it.
- The quality and amount of training conducted on the PRR was sufficient for the Marines to successfully employ it in a tactical environment.

2. Ease of Use. Overall, how easy was the radio to use?

Table 2. Ease of Use					
User ID	**N/A**	**Very Difficult 1**	**Difficult 2**	**Easy 3**	**Very Easy 4**
Platoon Leader MBITR			1		
Platoon Sgt MBITR					1
Squad Leader MBITR		1		1	2
Platoon Leader PRR				1	
Platoon Sgt PRR				1	
Squad Leaders PRR					4
Fire Team PRR				1	5
SAM PRR				1	4
Total: MBITR		**1/6**	**1/6**	**1/6**	**3/6**
Total: PRR				**3/17**	**14/17**

Remarks: Ease of Use.

- The Marines found the MBITR easy to operate when it was pre-loaded with frequencies, keymat, and hopsets/loadsets.
  - Additional training is required to enable the users to properly configure the MBITR.
- The Marines found the PRR and ICOM easy to use.

3. Ease of Changing Frequency. How easy was it to change frequencies?

Table 3. Ease of Changing Frequencies					
User ID	**N/A**	**Very Difficult 1**	**Difficult 2**	**Easy 3**	**Very Easy 4**
Platoon Leader MBITR				1	
Platoon Sgt MBITR					1
Squad Leader MBITR				1	3
Platoon Leader PRR					1
Platoon Sgt PRR					1
Squad Leader PRR					4
Fire Team Leader PRR				2	4
SAM PRR					5
Total: MBITR				**2/6**	**4/6**
Total: PRR				**2/17**	**15/17**

Remarks: Ease of Changing Frequency.

- The Marines found it easy to change frequencies on the MBITR.
  - Some of the Marines suggested the creation of a remote device that would allow them to change frequencies while the radio was still on their back.
- The Marines found it very easy to change the frequencies on the PRR.

4. Difficulty in Using Two Radios. How difficult was it to use two radios?

Table 4. Difficulty in using two radios					
User ID	**N/A**	**Very Difficult 1**	**Difficult 2**	**Easy 3**	**Very Easy 4**
Platoon Leader MBITR / PRR		1			
Platoon Sgt MBITR / PRR					1
Squad Leader MBITR / PRR		1		3	
Total: MBITR / PRR		**2/6**		**3/6**	**1/6**

Remarks: Difficulty in Using Two Radios.

1. The Marines found it very easy to use two radios with the PRR/MBITR single headset two-radio combination.
2. However, some Marines found it difficult to employ two radios when the volume of small unit communication traffic decreased their situation awareness of the leader.

5. Average number of transmissions per hour. On average, how many times per hour did you transmit traffic on the radio?

Table 5. Transmissions Per Hour						
USER ID	1-10 1	11-20 2	21-30 3	31-40 4	41-50 5	51-60 6
Platoon Leader MBITR			1			
Platoon Sgt MBITR				1		
Squad Leader MBITR	2	2				
Platoon Leader PRR					1	
Platoon Sgt PRR				1		
Squad Leader PRR	1	1	1		1	
Fire Team Leader PRR	1	2		1		2
SAM PRR	1	2				2
Total: MBITR	**2/6**	**2/6**	**1/6**	**1/6**		
Total: PRR	**3/17**	**5/17**	**1/17**	**2/17**	**2/17**	**4/17**

Remarks: Average transmissions per hour.

- There were more transmissions made at the Squad Leader/Fire Team Leader/SAM level than at the Platoon Commander/Squad Leader level.

6. Average number of receptions per hour. On average, how many times per hour did you receive traffic on the radio?

Table 6. Receptions Per Hour						
User ID	**1-10 1**	**11-20 2**	**21-30 3**	**31-40 4**	**41-50 5**	**51-60 6**
Platoon Leader MBITR			1			
Platoon Sgt MBITR					1	
Squad Leader MBITR	2		2			
Platoon Leader PRR					1	
Platoon Sgt PRR				1		
Squad Leader PRR	1		1	1		1
Fire Team Leader PRR	1	1	1	1		2
SAM PRR			2		1	2
Total: MBITR	**2/6**		**3/6**		**1/6**	
Total: PRR	**2/17**	**1/17**	**4/17**	**3/17**	**1/17**	**5/17**

Remarks: Average receptions per hour.

- There were more receptions received at the squad leader/fire team leader/SAM level than at the platoon leader/squad leader level.

7. **Frequency of type of Message—most frequent (1) to least frequent (4).** What type of message did you send most, (1 being the MOST FREQUENT, 2 being the second most, etc.)

Table 7a Frequency of Type of Message – Part 1								
User ID	**POSREP**				**SITREP**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Platoon Leader MBITR	1					1		
Platoon Sgt MBITR				1	1		1	
Squad Leader MBITR	2	2			1	2	1	
Platoon Leader PRR	1					1		
Platoon Sgt PRR		1				1		
Squad Leader PRR	3		1		1	3		
Fire Team PRR	4	2			2	4		
SAM PR	1	3	2		4			
Total: MBITR	**3/6**	**2/6**		**1/6**	**2/6**	**3/6**	**2/6**	
Total: PRR	**9/17**	**5/17**	**3/17**		**7/17**	**6/17**		

Table 7b Frequency of Type of Message – Part 2												
User ID	**Contact**				**CASREP**				**Call for Fire**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Platoon Leader MBITR			1					1				
Platoon Sgt MBITR						1						
Squad Leader MBITR	1		3					4				
Platoon Leader PRR			1					1				
Platoon Sgt PRR			1					1				
Squad Leader PRR		1	3					4				
Fire Team PRR			5					2				3
SAM PR		2	3					5				
Total: MBITR	**1/6**		**4/6**			**1/6**		**5/6**				
Total: PRR		**3/17**	**13/17**			**1/17**		**13/17**				

<u>Remarks:</u> Frequency of Type of Messages Transmitted.

- The position report and the situation report were the most frequent types of messages sent.

8. Mission Effectiveness. Did the radio allow you to perform your mission more effectively?

Table 8. Mission Effectiveness						
User ID	**Not at All 1**	**Same 2**	**Some-What Better 3**	**Better 4**	**Much Better 5**	**Remarks**
Platoon Leader MBITR			1			Number of Marines on net at times hindered certain information flow among leaders. MBITR would override PRR traffic.
Platoon Sgt MBITR					1	Greatly enhanced mission effectiveness. Easy to use.
Squad Leader MBITR				1	2	Gave better SA among key leaders. Can get position reports in order to coordinate attacks with combined arms.
		1				Creates an additional burden during mission preparation time. The timing would drift and battery life was short.
Platoon Leader PRR					1	Allowed greater dispersion and SA throughout the unit.
Platoon Sgt PRR					1	Gave key leaders communications with higher.
Squad Leader PRR					4	Key leaders did not have to congregate at one position to pass information on the situation. Teams could move more independently.
Fire Team Leader PRR				2	3	Constant information flow allows coordination with other teams and SA improved with the team.
	1					It did not work at all.
SAM PRR				2	3	Key element locations were identified without being compromised by shouting voice commands. Information passed faster and situational awareness was improved.
Total: MBITR		**1/6**	**1/6**	**1/6**	**3/6**	
Total: PRR	**1/17**			**4/17**	**12/17**	

<u>Remarks:</u> Contribution to Mission Effectiveness.

1. Marines found the MBITR increased mission effectiveness, but difficulties with establishing communication offset the improved capabilities.
2. The lack of adequate training and familiarity resulted in an inefficient use of the MBITR.
3. PRR was found to substantially increase mission effectiveness at the lowest levels.
   a. It was easy to operate and integrate with legacy radios.

9. Problems. Did you experience any problems with the radio?

Table 9. General Problems			
User ID	**Yes**	**No**	**Remarks**
Platoon Leader MBITR	1		Too many Marines on the net made passing information difficult at times due to interference by other communication traffic.
Platoon Sgt MBITR	1		Interference from other communications nets.
Squad Leader MBITR	4		The timing in SINCGAR mode would drift. It cut off communications on the PRR
Platoon Leader PRR	1		The headset was not waterproof enough in the jungle environment. Sweat coupled with humidity had an adverse on the radio. Dual mode PRR had a connection with MBITR
Platoon Sgt PRR		1	
Squad Leader PRR	2	2	The MBITR interfered with communication and not enough range. The rainy jungle environment created operational problems for it.
Fire Team PRR	6		Moisture in the headset and microphone appeared to short them out. Communication while inside a HUMVEE was difficult.
SAM PRR	3	2	Sometimes radio communications would break up. Batteries would require changing everyday.
Total: MBITR	**6/6**	**5/17**	
Total: PRR	**12/17**	**0**	

Remarks: General Problems.

1. The main problem the Marines had with the MBITR was it had precedence over the PRR, which meant traffic on the PRR was sometimes cutoff due to traffic on the MBITR.
2. The timing issue occurred in SINCGARS mode if a radio was on a different channel and was not transmitting to remain synchronized with the rest of the SINCGARS network.
3. The complaints with the PRR were:
   a. not long enough range,
   b. headset needed to be a bit thinner when worn with the Kevlar helmet.
4. In addition, the climate for this experiment was a very high humidity jungle environment. The amount moisture created by the Marines sweating coupled with the moisture in the air did not allow the headsets and microphones to dry quickly. This led to electrical shorts and increased corrosion in the PRRs.

10. Radio Ruggedness. Was the radio rugged enough to support your mission? Yes / No

Table 10. Rugged Enough?			
User ID	**Yes**	**No**	**Remarks**
Platoon Leader MBITR	1		
Platoon Sgt MBITR	1		
Squad Leader MBITR	3	1	
Platoon Leader PRR	1		
Platoon Sgt PRR	1		
Squad Leader PRR	4		
Fire Team PRR	4	2	It needs more waterproofing.
SAM PRR	5		
Total: MBITR	**5/6**	**1/6**	
Total: PRR	**15/17**	**2/17**	

Remarks: General Ruggedness.
The radios were rugged enough to support the mission.

11. Radio Carry Position. Where on your body did you carry the radio?

Table 11. Carry Location					
User ID	**Waist**	**Shoulder**	**Back (Camel Bak)**	**Other**	**Preference**
Platoon Leader MBITR			1		
Platoon Sgt MBITR		1			
Squad Leader MBITR		1	3		
Platoon Leader PRR		1			
Platoon Sgt PRR		1			
Squad Leader PRR		3		1	The chest was an alternate position.
Fire Team PRR		6			
SAM PRR		5			
Total: MBITR		**2/6**	**4/6**		
Total: PRR		**16/17**		**1/17**	

Remarks: Radio Carry Position.
1. The MBITR was carried in the MOLLE patrol pack.
2. The PRR was worn on the shoulder.

12. Radios, Headset, and Push-To-Talk Button Interference With Use of Weapon. Did the radio, headset, or push to talk button cause you any problems in using your assigned weapon?

Table 12. Interference With Use Of Weapon							
User ID	**Radio**		**Headset**		**Push-to Talk**		**Remarks**
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	
Platoon Leader MBITR		1		1		N/A	
Platoon Sgt MBITR		1		1		N/A	
Squad Leader MBITR		4		4		N/A	
Platoon Leader PRR		1		1		1	
Platoon Sgt PRR		1		1		1	
Squad Leader PRR		1		1		1	
Fire Team Leader PRR		6	2	4		6	Moisture created a short in microphone and earpiece.
SAM PRR	1	4	1	4	1	4	Wireless PTT was inconsistent in operation. Radio covered grenade pouch. Headset was to Bulky and was hard to wear with Kevlar.
Total: MBITR		**6/6**		**6/6**		**N/A**	
Total: PRR	**1/17**	**16/17**	**3/17**	**14/17**	**1/17**	**16/17**	

<u>Remarks:</u> Interference with Use of Weapon.

1. PRR headset earpiece was too thick when worn under Kevlar helmet.
2. Marines liked the wireless PTT that came with the PRR very much.
3. Marines want a better location to place the MBITR or a remote that allows them to change the channel without assistance from another Marine when MBITR is worn on the back.
   a. They need to be able to reach the channel selector while not getting the radio in the way of the weapon or gear.

13. Use of Headset. Did you use a headset with the radio? Yes / No

Table 13 Use of Headset				
User ID	**Hard Headset**	**Head Band**	**Problems**	
			Yes	**No**
Platoon Leader MBITR		1		1
Platoon Sgt MBITR		1		1
Squad Leader MBITR		4		4
Platoon Leader PRR		1		1
Platoon Sgt PRR		1		
Squad Leader PRR		4		4
Fire Team Leader PRR		6		6
SAM PRR		5		5
Total: MBITR		**6/6**		**6/6**
Total: PRR		**17/17**		**17/17**

Remarks: Use of Headset.
1. All of the Marines used the PRR headset the radios.
2. The headset of preference was the PRR style. The only complaint was that it was a bit snug under the Kevlar helmet.

14. Headset Comfort. How comfortable was the headset?

Table 14. Headset Comfort				
User ID	**Uncomfortable**	**OK**	**Comfortable**	**Very Comfortable**
Platoon Leader MBITR		1		
Platoon Sgt MBITR	1			
Squad Leader MBITR		3	1	
Platoon Leader PRR		1		
Platoon Sgt PRR	1			
Squad Leader PRR		3	1	
Fire Team Leader PRR	1	3	2	
SAM PRR	1	3		1
Total: MBITR	**1/6**	**4/6**	**1/6**	
Total: PRR	**3/17**	**9/17**	**3/17**	**1/17**

Remarks: Headset Comfort.
1. All Marines used the headset for the PRR even with the MBITR due to the dual mode of the PRR.

15. What recommendations do you have to improve the radio?

Table 15. Ways to Improve the Radio	
User ID	**Remarks**
Platoon Leader MBITR	
Platoon Sgt MBITR	Better for the antenna for the VHF.
Squad Leader MBITR	Better holster or harness. Allow user to set precedence of which radio will be allowed to override the other. A more ruggedized antennae for the VHF.
Platoon Leader PRR	
Platoon Sgt PRR	
Squad Leader PRR	Increase range. Employ the radio in the fleet
Fire Team PRR	Improve waterproofing and increase the range.
SAM PRR	Decrease the size of the radio.

16. What recommendations do you have to improve the headset?

Table 16. Ways to Improve the Headset	
User ID	**Remarks**
Platoon Leader MBITR	Make the earpiece thinner
Platoon Sgt MBITR	Make the earpiece thinner.
Squad Leader MBITR	
Platoon Leader PRR	
Platoon Sgt PRR	Make earpiece smaller so it can fit under the Kevlar helmet.
Squad Leader PRR	
Fire Team PRR	
SAM PRR	Need to be able to rotate the earpiece closer to the ear.

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

Table 17. Should Every Rifle Platoon Have this Capability			
User ID	**Yes**	**No**	**Remarks**
Platoon Leader MBITR	1		It takes practical application to get used to the radio, after that the radio would be beneficial.
Platoon Sgt MBITR	1		It gives the squad leaders the means to communicate with higher levels of command.
Squad Leader MBITR	4		Communication is a huge element in coordination of missions. In addition, it allows faster dissemination of situational awareness
Platoon Leader PRR	1		
Platoon Sgt PRR	1		FT leaders and squad leaders have the ability to control movement without having to move to different positions to pass information.
Squad Leader PRR	4		SLs can deploy FTs more effectively—with on the spot reporting.
Fire Team PRR	6		Enhances coordination and dispersion
SAM PRR	5		Accurate position reports.
Total: MBITR	**6/6**		
Total: PRR	**17/17**		