

battle drills for reacting to near and far ambushes.

- We must develop and refine standard unit procedures to address these tactical considerations.

- We must improve the quality of our marksmanship training, because weapon proficiency forms the very foundation of an infantryman's strength. Toward that end, we must place more emphasis on firing our weapons in various settings. Although qualification ranges are important,

they should make up only a part of a marksmanship program. Known distance firing does develop shooting fundamentals, provide downrange feedback, and instill in us confidence in our weapons. But we must also use special ranges that have been tailored to unique missions such as this platoon live fire ambush.

Tomorrow's battlefield will have indistinct boundaries, and battle in depth will be the norm. An ambush offers one of the most efficient

methods of fighting outnumbered and winning. Imagination and a little work can provide realistic training for this method of fighting. Incorporating these lessons and recommendations will increase our combat readiness.

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Mortars in Urban Combat

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Commanders operating in conventional environments are accustomed to quick, responsive, and effective indirect fire from their mortar platoons. Faced with operating in an urban environment, however, these same commanders are likely to see a significant reduction in the effectiveness of their mortar platoons.

As leader of a mechanized infantry 81mm mortar platoon in the Berlin Brigade for the past year, I have noted several problems unique to an urban environment that substantially reduce my mortars' ability to provide effective fire support. Most of these problems do not apply when attacking a built-up area from open terrain, but all of them arise to some degree when fighting within a built-up area.

These problems include interference with radio communications, reduction of weapon range, reduction of ammunition effectiveness, increased difficulty in acquiring and hitting targets, increased ammunition expenditures with the attendant strain on supply and transportation systems, unrealistic tar-

get planning, and difficulties the mortar platoons themselves have in operating in a new and difficult environment. (See also "Mortars: Able to Leap Tall Buildings," by Captains Stewart E. Goesch and Robert A. Lambert, *INFANTRY*, July-August 1985, pages 38-40; "Mortars in MOUT," by Major Thomas H. Whitley and Captain Carl W. Riester, *INFANTRY*, September-October 1983, pages 37-38; and "Mortars in Cities," by Captain William B. Crews, *INFANTRY*, March-April 1983, pages 13-15.)

These limiting factors do not totally negate the effectiveness of mortars though. In fact, the very high angle of fire of a mortar round can make it extremely useful in urban terrain. But urban terrain varies in density and construction materials, which can cause variations in the effectiveness of mortar fire, and operational requirements can affect the employment and capability of mortars.

Communications. The canyon-like nature of heavily urbanized inner city terrain can severely limit the range of

FM radios. A commander or FIST element calling a fire mission often needs an RC-292 antenna or a powerful vehicle-mounted radio. All the FDC vehicles in my battalion, for example, are equipped with VRC-47s because GRC-160s are not powerful enough.

In the defense, wire communication should be used whenever possible because of its increased reliability and security. Civilian telephones can also provide reliable communications, but they are not secure.

Range of Weapons Systems. Tall, well-constructed buildings offer excellent protection against counter-battery fire and enemy air attack. Because of this, unit mortar SOPs in Berlin call for locating firing sections close to tall concrete and stone buildings, with FDCs operating from nearby basements. Unfortunately, to fire over these buildings, a platoon has to use high minimum elevations.

For an 81mm mortar, our standard minimum elevation (based on being within 40 meters of a building at least three stories tall) is 1331 mils. This

reduces the gun's maximum range from 4,595 meters to less than 3,000 meters on charge nine. By comparison, 4.2-inch mortars must fire on their maximum elevation of 1065 mils, which reduces their maximum range to 5,860 meters using M329A2 ammunition.

Commanders, fire support planners, and mortar platoon leaders must be aware of, and plan for, this reduction in capability.

Ammunition Effectiveness. The presence of buildings in an impact area reduces the effectiveness of both high explosive and illumination rounds. In some cases it will also affect the performance of white phosphorous rounds. (Anyone interested in a detailed study of the effects of indirect fire on targets in urban areas should read the Department of Defense reports based on actual tests conducted at White Sands, New Mexico.) Generally, built-up areas absorb much of the blast of artillery

and mortar rounds.

Because of the cover urban terrain provides, 4.2-inch mortars will be the most effective. Although my experience with 60mm mortars is limited, my impression is that they are generally not powerful or accurate enough for use in urban areas where there is a lot of concrete and stone construction. If most of the buildings are wood or fiberboard, though, the 60mm will have some utility.

Even with 81mm and 4.2-inch mortars, urban combat will require pinpoint accuracy to inflict heavy casualties on the enemy. If a target is in or around buildings that are more than four stories tall, rounds will have a tendency to hit the roof of a building between the gun and the target, or the wall of a building beyond the target. Any lateral error in the strike of a round will often result in the blast being absorbed by a building between it and the target.

Detailed, large-scale maps of the area of operations will help the FDCs achieve the necessary accuracy. The Berlin Brigade keeps 1:1,500 scale maps on hand for use in its FDCs. If the situation permits, careful registration and the use of registration corrections and meteorological data will make a unit's mortars much more accurate.

Finally, it may be possible to adjust pre-planned targets before actual combat begins. In this ideal circumstance, the commander's mortars would be more effective.

Because of the numerous shadows the buildings will cast, illumination rounds also require precise adjustment. Again, adjustment before battle may be possible, especially in the defense.

White phosphorous ammunition has two primary uses; as an incendiary and as an obscurant. It can be highly effective as an incendiary when used against wood or fiberboard structures, but tactical and political considerations may



A mortar unit's normal procedures will have to be modified when it is operating in an urban environment.

limit its usefulness in this capacity. Specifically, commanders must be sure that any fires that are started can be confined to the enemy's areas of the battlefield. They must also consider the effect fires will have on civilians in the area. Burning local residents out of their homes in many instances can have adverse effects on future military operations in the area.

White phosphorous used as an obscurant will be effective in most cases, but rapidly changing air currents around buildings may blow the smoke in the wrong direction. Also, phosphorous rounds can displace or consume enough oxygen to asphyxiate personnel in nearby buildings. This is obviously something to consider when firing rounds near friendly troops.

It is ironic that while mortar fire will have to be highly accurate to be effective, it will also be more difficult to spot and adjust. Because of the visibility restrictions an urban environment usually imposes, getting rounds on target requires particularly well-trained forward observers. At times, however, an observer may have to rely on just plain guesswork to adjust fires.

Target Planning. When conducting

a defensive operation or deliberate attack, commanders and fire support planners often try to put far too many targets on the overlays for their area of operations. The three-dimensional urban battlefield will have many locations for the enemy to use, and commanders naturally want to plan for all contingencies. But targeting every possible enemy location is ineffective and counter-productive. It is much better to pre-plan a few of the more dangerous key targets, adjust the guns before the battle, if possible, and rely on well-trained observers, gunners, and FDCs to do the rest.

The personnel in a mortar platoon will have to learn to cope with the numerous challenges an urban area presents. Their normal procedures will often have to be modified to unique situations—baseplates must be sand-bagged if firing ground-mounted on a hard surface; improvised aiming points often have to substitute for aiming stakes; and sections often have to be deployed in nonstandard formations requiring sheaf adjustment. Terrain mortar positioning corrections (TMPC) as described in FM 7-90 can be used to compensate for nonstandard

formations.

Concentrations of steel and wire in urban areas may make it impossible to use the magnetic compass on the M-2 aiming circle. If this occurs, a platoon leader can lay a section using non-magnetic lay techniques. To do this, in simplest terms, he declinates the aiming circle using map deflections, emplaces a north reference stake, and the operator then lays the mortar section. These and other changes to SOPs may slow a platoon's operations.

Urban combat will challenge all the elements of the fire support team and will require commanders to familiarize themselves with the limitations built-up areas can impose on their mortars. Staff sections will also have to plan for the higher ammunition expenditures that may be necessary to accomplish the mission.

Despite these difficulties, given well-trained observers and mortar platoons, unit mortars can still be effective during operations on urban terrain.

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SWAP SHOP



NBC training, although extremely crucial, is often boring and redundant. Soldiers strongly dislike wearing MOPP uniforms and reacting to contaminated areas, especially when it is 95 degrees outside and they already know there was never any danger in the first place.

As the NBC officer of my unit, I have been faced with these negative responses along with the lack of motivation that comes with this training. Knowing these problems, I have tested a few safe but effective methods of NBC training that have helped make it more interesting.

One effective method involves two resources--a ten-pound bag of flour and a single-engine airplane. The pilot loads the plane with flour and flies over the troops, releasing the flour as he goes by. Although this may sound foolish, the men don't think so when I tell them it is CS powder as I get into my protective clothing. They react as fast to the flour as they would if it were the real thing.

(Submitted by Lieutenant Shawn R. Mell, scout platoon leader, 3d Battalion, 109th Infantry, Pennsylvania Army National Guard.)

Another method involves a jar of molasses. I dip a stick into the jar and, while in MOPP 4, walk up to some of my soldiers and touch their hands with the molasses. I tell them it is an extract of poison sumac that is very allergenic. The men decontaminate their skin in a matter of seconds.

Ideas such as these can be used over and over again, and the men don't have to be conducting NBC training to do it. These methods work even during missions where there is not a high chance of an NBC attack. This allows a leader to evaluate how well his men will react to an unplanned attack.

NBC training is one of the most difficult tasks for a leader to train effectively. If it is scheduled training, the men usually know what is going to happen next. The secret to successful NBC training is never to tell the men what the real substance is but to make them react to an unexpected situation.