own backyard.

For the small unit commander, the principle of surprise is of paramount importance in all operations—the offense, defense, patrols of all types, road and motor marches, ambushes. If he is to attain success in battle comparable to that achieved by this platoon of the 173d Airborne Brigade in War Zone D, he must deny the enemy the advantage of surprise while gaining and maintaining the ability to surprise the enemy.

# Mortars
## Tactical Employment

COLONEL ROBERT D. SANDER

The tactical employment of mortars and the effects that mortars produce have been documented at our combat training centers (CTCs) and, in simple terms, mortars are not producing the results that their potential promises. Typical observations that support this statement include the following:

- Mortars make no contribution. They are not effective.
- Fire support teams (FISTs) and forward observers (FOs) send all fire missions to the field artillery.
- Mortars are not integrated into the fire support plan.
- The effects of mortars are not assessed realistically by the simulation systems used at the CTCs.
- Mortars do not stay within range and are not available when needed.
- Mortars are inaccurate; they seldom use surveyed positions and do not apply meteorological corrections.
- Staff responsibilities for mortars are not clearly established in doctrine and unit SOPs.

(These employment problems are the focus of a study being conducted by the Infantry School, the Center for Army Lessons Learned (CALL), and the Rand Corporation. Although the results of the study are not yet available, the specific observations noted above reflect valid concerns. Because mortars involve both the fire support and the maneuver arms communities, a combined effort is required if we are going to make substantial progress.)

The allegation that we are failing to use mortars to their full potential is absolutely true, and I believe the principal reasons for this failure lie outside the mortar platoon. We do not use mortars to their full potential because we fail to complete the detailed planning and preparation that is needed, and we fail to support planning with the required training.

### PLANNING

There is a fundamental difference between the planning process for field artillery targets and the process for mortar targets. After a field artillery target is planned and approved in the fire support coordination and maneuver command channels, it is passed to the field artillery battalion headquarters where there is a staff available to continue the planning process and to determine such details as required positioning, most effective ammunition, the number of volleys required to achieve the desired effects, and logistical requirements.

The mortar platoon leader has no such subordinate staff or dedicated representative on the battalion staff. While the mortar platoon leader and his platoon sergeant are capable of performing this function, their primary duties are those of combat leaders, and the current operation normally requires their full attention.

The commander and his staff, therefore, must develop a concept that includes consideration of calls for fire or execution responsibilities, communication requirements, positioning and movement, and the terminal effects the mortars are expected to achieve on each target. The missions they assign to their mortars must be defined in terms of targets that are critical to the success of the battalion or task force mission, the effects required on those targets, and the specific time and circumstances in which these fires are required.

The platoon leader's role in the planning process is to take this detailed concept for employment and the accompanying fire plan (which together state *what* is to be done) and continue the planning process to determine *how* it will be done. The mortar platoon leader can then add the resolution required to convert this concept into a detailed plan.

Equally important is the concept of purpose. The platoon leader must understand not only how his fires will support the maneuver elements, but also the role of the other fire support systems so that he can implement any changes that may become necessary on a battlefield peopled with an uncooperative enemy.

Maneuver company commanders and

platoon leaders also play a critical role in planning and executing the mortar fire plan. As the plan for fire support is developed during the top-down fire-planning process, therefore, call for fire or execution responsibility must be established, and observers, both primary and back-up, must be assigned for each target.

Because fire support teams and forward observers work for the company commander or rifle platoon leader they support, responsibilities for calls for fire are established through command channels, not fire support channels. While this requirement is generally understood and accepted, the detailed planning a company commander and his fire support officer must do is frequently overlooked.

For example, they must position observers to observe the targets and the trigger lines, refine the target locations as required, and plan and coordinate fires on additional targets in accordance with the fire support plan. To make sure fires are synchronized with maneuver, the observers must have a complete understanding of their targets and of the timing and control required in calls for fire.

This portion of the company plan has to be coordinated with the staff and the mortar platoon, briefed to the battalion commander by the company commander, and rehearsed. Other details must be addressed and understood by both the observers and the fire direction center—which communications net the observers will use, for example, along with alternate nets, anti-jamming procedures, alternate routing for the call for fire, and alternate means of communication. After all, if the communication plan fails, so does the entire indirect fire support plan.

Before reliable radio communications can be established, the range of and the line-of-sight requirements for the FM radios must be met. While the ranges of the mortar and tactical radios are generally compatible, the observers or fire support officers must also be able to talk to the field artillery fire direction center and the battalion fire support element. The mortars' ability to exploit high angle fires and occupy positions in deep defilade to improve their survivability from counterfire can often contradict the need to maintain line of sight for communications.

The general rule of "supporting to supported" can be applied to the responsibility for establishing communications, but reason and logic must prevail. Retransmission assets are scarce, and mortar platoons can be expected to engage targets called in to them by observers in a variety of locations. In some cases, it may be necessary for company commanders to relocate their observers or adhere to positioning constraints to establish communications.

Line-of-sight problems can be predicted with reasonable accuracy on the basis of a map inspection. This map inspection and the adjustment of mortar or observer locations must be an inherent part of the planning process. Whenever possible, or whenever prudent from an electronic warfare perspective, the communications plan should be tested during the rehearsal process.

## CHANGING NETS

The number of times observers are expected to change nets during battle should be kept to a minimum—not because it is a difficult task but because it is one that can easily be overlooked in the heat of battle. Whenever possible, forward observers should be dedicated to the mortars.

The positioning and movement of the mortars require the attention of both the staff and the mortar platoon leader. While it may seem like a cliche to say that everyone must understand the SOP, it is certainly a fact in this case. Doctrine on the specific responsibilities and roles of the S-3, the FSO, and the mortar platoon leader varies from one publication to another. Stated more positively, doctrine actually gives the commander great latitude in determining these procedures.

In any case, the starting point in planning the movement and positioning of mortars will include the targets, the effects desired, the movement time between positions, and the availability and role of other fire support systems.

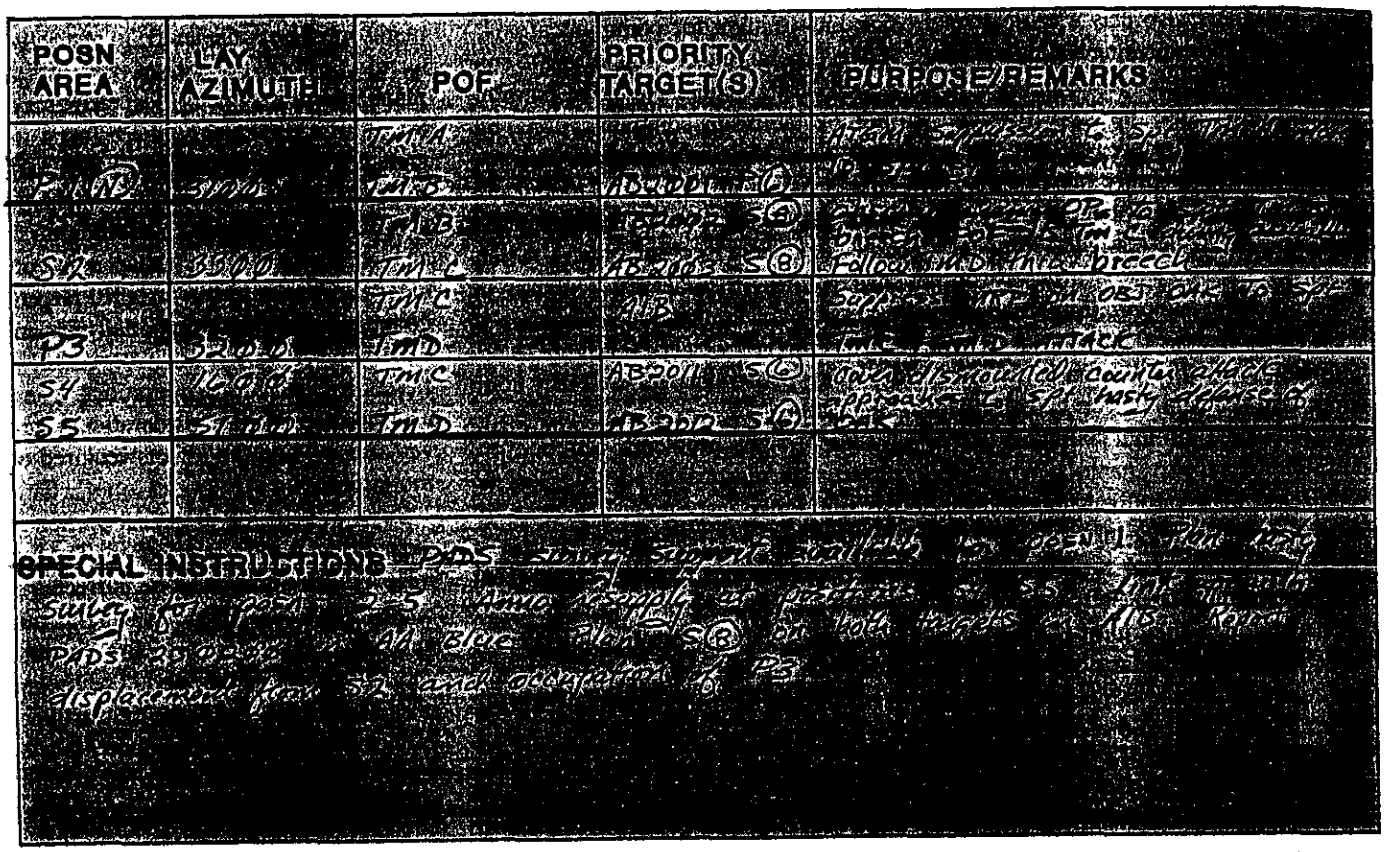
Once the critical mortar engagements have been identified in the planning process, movement to support these engagements must be considered. In restrictive terrain, priority of routes and terrain management may be critical elements of the plan. Obviously, there must be enough movement time, a thorough route reconnaissance, and a movement rehearsal whenever possible. In addition, as in all tactical movements, leaders must consider the ranges to the assigned targets; communications with supported units and observers; security and survivability; flexibility; and future operations. There are two additional considerations—survey support and the effects required on the targets.

Survey support is a critical portion of the plan that is often overlooked. The first misconception that must be corrected is that mortars can get along without surveys because they are area fire weapons and adjustment is expected. The second misconception is that if the field artillery cannot provide survey support, mortar leaders have no other choice but to determine their positions by map spots.

A survey is essential for indirect lay, and indirect lay is rapidly becoming essential for survivability. It is well-documented that self-location by map spot normally involves an error of 400 to 500 meters. In accepting this much error we must also accept loss of surprise, more adjusting rounds, more lost time, more radio transmissions, and greater risk of counterbattery acquisition. It can also lead to a higher risk of fratricide or the discovery at precisely the wrong time that targets that appear to be at the maximum range are, in fact, out of range.

Our doctrine charges the mortar platoon leader with the task of coordinating with the FSO for survey support from the supporting field artillery unit. And obviously, the field artillery unit with its position azimuth determining system (PADS) and organic survey sections is the best remedy until a positive navigation system can be fielded.

PADS and external support, however, are not always available, even for field artillery batteries. The solution then is a hasty survey, and all the equipment required to do one is on hand in the mortar platoon. The only components normally missing are knowledge, training, and prior planning.




Hasty survey procedures are found in Field Manual 23-91 and in the new Field Manual 23-90, which should be in the field later this year. More detailed discussions are in Chapter 5 of Training Circular 6-50. Survey training is not now included in the Infantry Mortar Platoon Course or the Advanced Noncommissioned Officers Course, although projected changes to the course would add this instruction. Training support is available, however, from the direct support field artillery battalion. Within field artillery batteries, hasty survey is practiced routinely, and in many units it is a drill that receives command attention.

A hasty survey works, it is relatively fast (assuming training time is devoted to developing and maintaining proficiency), it is infinitely more accurate than map spotting, and training assistance is available.

As for the terminal effects of mortars, neither fire support officers, commanders, nor mortarmen understand them well. Most seriously underestimate the number of volleys required to achieve a specified level of target coverage. The reason for this is simple: The information is not in our unclassified doctrinal publications. Terminal effects data can be found only in a series of publications referred to as Joint Munitions Effects Manuals (JMEMs), which are classified Confidential.

Within the field artillery system, the process of determining the number of volleys required for a given target normally takes place in the field artillery tactical operation center. The S-3 or fire direction officer makes that decision on the basis of his training and experience. In an automated system, the computer software is programmed with the JMEMs data. Unfortunately, though, there is no such system for mortars. Mortar leaders must rely on "experience," and combat experience in our FDCs has long since faded away. To make better decisions, they are going to have to "hit the books." In this case, the books are:

- For the 60mm mortar—FM 101-60-31, dated 13 October 1988.
- For the 81mm mortar—FM 101-60-1, Revision 2 with Change 1, 17 November 1988.
- For the 107mm mortar—FM 101-60-70, Revision 1 with Change 1, 17 May 1979.

An analysis of the JMEMs data can produce some fundamental conclusions. First, the number of volleys required can significantly affect planning for ammunition resupply actions. Second, depending upon the nature of the targets, the desired effects, and the unit's ammunition haul and resupply capability, the number of targets in the fire plan may have to be reduced. Third, because of the volume of fire or the mass needed to achieve a required effect, deployment and movement by section may not be feasible, and the mortars will have to move and deploy by platoon. In some instances, the requirement for mass and for moving by platoon means that the concept of "continuous fire support" from the mortars may need to be redefined.

The continous support of fast-moving mechanized offensive operations may also call for the piecemeal commitment of the mortars. And there may be some types of targets that are not within the capability of the mortars to attack, regardless of the number of volleys they fire. Again, we must focus the mortar platoon's mission on critical targets that are compatible with its capabilities and then maneuver the platoon into a position to provide these fires at the time and in

the volume needed.

Once the concept of employment has been developed, the next task is to convey this information to the platoon leader in a form that quickly and graphically describes his mission. A matrix is a good technique. The example of a mortar execution matrix shown here represents the minimum detail a battalion commander owes the mortar platoon leader.

The entries across the top of the matrix are the following:

• **Position Area.** An entry under this column means it is the general area the mortars are expected to occupy. The positions are identified by sequential numbers and preceded by either a P, for movement by platoon, or an S, for displacement and occupation by section.

Position 1 in this example is followed by an N to indicate that a night movement and occupation is required. The staff has made certain that use of the terrain has been coordinated and that the mortars will be able to reach the assigned targets from these positions.

• **Lazy Azimuth.** The azimuth is measured from the center of the position area to the center of the area in which mortar coverage is required. This becomes increasingly important when working in non-linear tactical situations or with carrier mounted mortars that have traverse limitations.

• **Priority of Fires (POF).** No change from current doctrine.

• **Priority Targets.** The matrix not only identifies the priority targets that correspond with the task force's forward movement but also indicates the number of volleys that will be required to achieve the desired effect. The letters P or S indicate whether platoon or section volleys are desired, and the number that follows indicates the minimum number of volleys. A review of the total number of volleys provides the basis for initial ammunition resupply considerations.

• **Purpose/Remarks.** A statement of purpose is entered in this column so that the platoon leader can better understand his platoon's role in the coming battle and how his unit is expected to support the commander's intent. Given this information, he can better anticipate the requirements generated by enemy action or by a changing tactical situation.

Admittedly, this approach to mortar fire planning can be said to contradict current doctrine. Some will say that the mortar platoon must be given the entire indirect fire target list and be prepared to fire any or all of those targets. In theory, it is hard to disagree with this view. But this approach sets an unrealistic goal for the mortar platoon to reach and gives the mortar platoon leader a mission he cannot possibly complete. When any system fails as often as our current system (as it is practiced), it is time for a change.

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# Heavy Mortars
## New Thoughts on Tactical Employment

LIEUTENANT CHRISTOPHER J. L. ALLEN

The Army's doctrine and methods for employing mechanized infantry have changed radically in the past five years. The introduction of the M1A1 main battle tank and the M2 Bradley fighting vehicle has contributed to the intensity of mechanized warfare. In addition, at the National Training Center (NTC) at Fort Irwin, California, inventive commanders are now pushing their mechanized forces toward deeper and swifter offenses and defenses. The heavy mortar platoons in these units must either adapt to the changes or be relegated to the role of a garrison detail force.

Most mortar platoons are underused and neglected, as numerous rotations to the National Training Center have painfully illustrated. This state of affairs has resulted partly from too much adherence to the doctrine in Field Manual 7-90, Tactical Employment of Mortars, and partly from too few commanders who are willing to "waste time" ensuring that their organic fire support assets are employed effectively.

In some offensive operations, heavy mortar platoons receive few if any calls for fire. In defensive operations, they usually go through the motions of setting up but chiefly to appease an evaluator. Commanders, all too often, seem to expect to receive reports during after action reviews on the way the mortar platoon "messed up."

In light of all this, I believe that some