all Infantry Pre-Command Course students while they are at Fort Benning.)

In preparing soldiers to attend the Ranger Course, there is no substitute for leader training in the parent unit. As an example, in comparing students who had pre-ranger training with those who had not, current figures indicate that at least 13 percent more of those who had had this training passed prerequisite testing, and that at least 13 percent more of those with pre-training successfully passed the course. A more thorough screening and pre-training by the chain of command will go a long way toward laying a foundation for success.

The Ranger Course continues to produce tough, confident leaders who are capable of pushing themselves to the limit of physical endurance. Course graduates are prepared to live up to the Ranger motto so valiantly earned by the 5th Ranger Battalion on D-Day 1944: *Rangers Lead the Way.*

Understanding Fire Support

CAPTAIN JONATHAN D. THOMPSON

Field artillery is undoubtedly the infantry's most important source of fire support. It is therefore essential that each branch understand the way the other functions. Unfortunately, though, many company grade officers of both branches know little about the other. This lack of understanding and experience prevents both the maneuver company commander and the fire support officer (FSO) from taking full advantage of the fire support means available.

In an effort to improve understanding on both sides, the Infantry School at Fort Benning, Georgia, and the Field Artillery School at Fort Sill, Oklahoma, have started a program in which graduates of the Infantry Officer Advanced Course (IOAC) attend a portion of the Field Artillery Officer Advanced Course (FAOAC).

An Infantry officer attending FAOAC explains maneuver doctrine and tactics to the Field Artillery officers as they prepare their orders. To do this, he fills a staff position such as the S-2 and advises the student S-3 during the planning. In exchange, he receives a full understanding of what fire support can do for him. As a result, when he becomes a company commander and a battalion staff officer, he will be far better able to integrate fires into a maneuver plan.

While at Fort Sill, the Infantry officers go through the small group instruction (SGI) phase, which lasts 12 weeks. This instruction focuses on preparing Field Artillery officers to serve as battery commanders and battalion and brigade FSOs. A Field Artillery major leads each small group, which consists of 15 to 18 students.

The small group leader teaches primarily through practical exercises in which the students receive a tactical scenario and then use the estimate process to develop a five-paragraph operations order. While this process is similar to that in IOAC, the FAOAC concentrates more on battalion and brigade level orders.

I attended FAOAC as a member of the second test group to participate in the program. The course taught me several important lessons. While these lessons are not new, they may serve as reminders for future company commanders who have had no combat experience.

Fire support is the maneuver commander's responsibility. Of course, at company level, the fire support officer will advise the maneuver commander and coordinate fires. This lesson implies two things. First, the maneuver commander must know the language of fire support. *(See "The Language of Fire Support," Lieutenant Colonel Robert D. Sander, INFANTRY, March-April 1990, pages 21-24.)* Secondly, the FSO must understand maneuver tactics, control measures, and terms. Since a company FSO is usually a junior Field Artillery lieutenant with little or no experience with maneuver forces, the commander should sit down with him before they go to the field to make sure they understand each other.

The commander's next step is to explain his scheme of maneuver to the FSO and the way he wants the available fires to support it. This results in the commander's concept for fires, which the FSO will write in the Fires paragraph of the operations order. The FSO can then plan the use of supporting fires to assist the commander in accomplishing his mission.

The commander's responsibilities do not end with the planning phase. He also needs to include the FSO and the fire plan into all rehearsals. During the battle, he needs to ensure that the FSO executes fire missions when and where

he wants them. A failure during any part of this process rests squarely on the maneuver commander's shoulders. Thus, he and not the FSO is responsible for fire planning and execution.

Fires must be planned with a purpose. This second lesson derives from the first. Once again, the success at this point depends on the commander's understanding of the language of fire support. He not only needs to know the definition of *targets, series, groups,* and the like, but he must know what fire support he has available. In addition, he should have a realistic picture of what he can accomplish with the resources he has available. For example, if only the battalion mortar platoon will support the unit, he cannot expect that unit to stop a motorized rifle company.

Another problem with fire planning is where to put targets. In my IOAC class, we often planned targets on such major terrain features as hills and road intersections. Then, as the situation required, we would shift from those known points.

The battalion FSO, however, may *allocate only 8 to 15 targets to a* company FSO. With this limited number, the company commander and his FSO need to plan their targets at critical locations on the battlefield. For example, if the commander's purpose is for the fires to suppress all enemy observation points (OPs), then a critical target might be any known or likely OP. Another critical location might be a river crossing site where the commander may want smoke.

By identifying a purpose and carefully planning their supporting fires, the commander and FSO will reduce the response time the artillery needs. More important, the fires will, indeed, support the scheme of maneuver.

The commander must know and use fire support coordination measures. Fire support coordination measures (FSCMs) are an important tool for the commander to use in protecting his soldiers while providing timely fires. Since the maneuver commander must approve any FSCMs recommended by the FSO, it is imperative that he understand their meaning.

At company level, the commander will most commonly use a coordinated fire line (CFL), a restrictive fire line (RFL), and an airspace coordination area (ACA).

A CFL is permissive in that it allows units to fire across boundaries without further coordination. Thus, before putting a CFL into effect, the commander must ensure that all the troops are behind the line.

An RFL prevents converging units from firing at each other, and it applies to both indirect and direct fires. The headquarters common to both converging units will establish an RFL, but the approving authority for fires is the commander into whose area the fires will go.

An ACA allows simultaneous engagement by both indirect fire and air

support. In other words, it prevents artillery units from shooting into an aircraft's flight path. The easiest and most preferred method of establishing an ACA is informally, on the basis of major terrain features. To be effective, the commander needs to know where the aircraft are coming from and by what routes they will leave the area. If an ACA is informal, the FSO can turn it on and off as required.

Other FSCMs include free fire areas, restrictive fire areas, no fire areas, and a fire support coordination line. Most of the time, a headquarters higher than brigade will establish these, but commanders at all levels need to know their definitions.

The maneuver commander must understand the capabilities and limitations of munitions. Since the M712 Copperhead projectile is a limited resource, normally either the battalion or brigade commander will retain control over it. If brigade gives Copperhead priority to a battalion, however, the battalion commander can further delegate that priority to one of his companies or teams. If this happens, the responsible company commander must understand its limitations so he can achieve the greatest effect in the engagement area.

In an armor or mechanized company, the FSO's fire support vehicle (FSV) contains a ground or vehicle laser locator designator (G/VLLD) with which the FSO can designate targets. The company may also have a combat observation laser team (COLT) attached, which has the same capability as the FSV. If the company commander has Copperhead responsibility, he must carefully plan the location of the designating source, keeping in mind the following points:

- The location must permit the observer to designate the target for at least 20 seconds. Thus, he will need a tracking window similar to the one a TOW system requires.
- The angle between the gun-target line and the observer-target line (angle T) cannot exceed 800 mils. Otherwise, the target will not reflect enough laser energy for the round to acquire it.
- Since the M113-based FSV cannot keep up with the M2 Bradley fighting vehicle or the M1 tank, if the unit will be moving, the commander also needs to consider the time it will take the FSV to move. This will help him plan positions so he will always have the designating capability available.

Another limitation with the Copperhead is the effects of smoke and dust on the round. Too much obscuration will diffuse the energy reflected off the target, and once again, will prevent the round from acquiring the target. Thus, if a company commander is going to fire Copperheads in an engagement, he needs to do it early before subsequent rounds create too much smoke and dust.

The commander must know the limitations of artillery-delivered minefields. Rarely will a company commander be given the authority to emplace a FASCAM (family of scatterable mines) minefield in or near his area of operations. But if he is given that authority, he must know something about FAS-

CAM. In addition, the battalion commander may ask his subordinates to nominate areas for minefields.

Once a unit employs FASCAM, the mines have a pre-set self-destruct time so that units can use the area after the mines have exploded. But the commander should not count on every mine to self-destruct, and he should use caution if he must move through a former FASCAM area.

Another concern of the company commander should be what will happen to his fire support if the supporting artillery unit shoots FASCAM. It will take a 155mm field artillery battery 20 minutes to fire a planned minefield of 400 x 400 meters and an additional amount of time to displace to reduce the counterfire threat. During this time, no other artillery fires will be going out. If the direct support field artillery battalion is not reinforced, this will take away one-third of the brigade's artillery support while the unit emplaces the mines.

Lastly, if a company commander is asked to nominate a target area to the battalion, he should realize that the mines are not good on all terrain. They will be less effective if employed on hard areas such as those in cities or on soft areas such as marshes or snow-covered terrain. (It is well to note that remote antiarmor mine system (RAAMS) mines will not deploy their tripwires if they tilt more than 50 degrees. Thus, they should not be used on steep or broken terrain.)

Although these are not new lessons, in a peacetime Army many infantry units may not get to train with the artillery units and other fire support elements they may work with in combat.

Fire support will play as important a role in the future as it has in past wars. As the OAC infantry-artillery program develops more fully, it will play a part in teaching company grade infantry officers about fire support and future FSOs about maneuver. The end result will be better synchronization between artillery and maneuver forces, with correspondingly better results on the battlefield.

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Artillery Effects Test

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As part of a study of artillery effects, the following scenario was fired three times in a test at Fort Sill in June 1990:

A mechanized infantry team commander is given a mission to defend and hold key terrain. After a review of the area, he develops a plan and assigns areas of responsibility to each of his subordinate platoon leaders. With engineer support, fighting positions with overhead cover are prepared for the infantry. Turret and "hull-down" positions are prepared for the Abrams tanks and Bradley fighting vehicles. Obstacles consisting of a tank ditch, minefields, and wire are emplaced in front of the infantry positions.

Enemy intelligence units monitor this activity and information is collected. The enemy commander is ordered to attack. As part of his plan, an artillery preparation is ordered with a criterion of 30 percent destruction. Three enemy artillery battalions fire 2,600 rounds of conventional munitions and 15 minutes later, 50 percent of the defenders are dead or wounded.

This test was designed to examine both U.S. and threat doctrine and to measure artillery effects on troops and equipment entrenched in a defensive position. The effects were more devastating than our Joint Munitions Effects Manuals (JMEMs) predict. They clearly demonstrated that an artillery unit firing Soviet norms can achieve the desired degree of destruction. At the same time, though, they also demonstrated that properly constructed defensive fighting positions and properly protected soldiers will help units survive artillery fires.

Our "target" was a defensive position designed by representatives of the U.S. Army's Armor and Infantry Schools. The position design was based on a European scenario (see diagram). The doctrine used to establish dismounted defensive positions is essentially the same, however, for either a European or a Southwest Asia (SWA) scenario. The threat forces that U.S. Army ground forces faced in SWA used essentially the same doctrine as that of the Soviets. Thus, the results obtained from the test are valid for either situation.