

TOC Counterfire Battle Drill

by Captain Robert D. Kirby and
Chief Warrant Officer Three Robert A. Nelson, Jr.

The opposing force (OPFOR) 120-mm mortars fired on the brigade's breaching force, violating an active critical friendly zone (CFZ). Five minutes later, Paladin battery fire suppressed the mortars and destroyed two tubes.

While the first mission was being processed, the Q-36 Firefinder radar acquired a battery of 2S1 howitzers firing, violating a call-for-fire zone (CFFZ). The direct support (DS) battalion tactical operations center (TOC) cleared the mission and passed it to the reinforcing (R) artillery battalion. Minutes later, multiple-launch rocket system (MLRS) launchers destroyed the 2S1s.

In this scenario, the DS battalion executed the brigade's essential fire support task (EFST) of suppressing the enemy's artillery to protect the breaching force. The battalion's success was, in large part, due to a counterfire battle drill in its TOC that dramatically reduced acquire-to-fire times.

This article summarizes the counterfire tactics, techniques and procedures (TTP) employed by successful units at the National Training Center (NTC), Fort Irwin, California. We discuss the TOC's counterfire battle drill within the context of the targeting process, from planning through execution. The TTP work equally well in DS and R battalion TOCs.

The Counterfire TOC

To succeed in the counterfire battle drill, the battalion TOC must set the conditions to function quickly and efficiently. The battalion establishes conditions in terms of the TOC's physical layout, communications, computer setup, information management and TOC training.



Iraqi 122-mm
Howitzers, 1991

Target Number	Point-of-Origin	Point-of-Impact	Time Acquired	Time Mission Fired	Acquire-to-Fire Time	Rounds Fired	Probable Target Type	Estimated BDA
AD8004	28522214	—	1401	1403	2	12 Rkts	2S19	4
AD8005	28532165	46321478	1402	1406	4	Bn ③ DP	2S1	3
AD8006	28582170	46321478	1402	—	—	—	2S1	Did Not Fire

Legend: BDA = Battle Damage Assessment Bn = Battalion DP = Dual-Purpose Improved Conventional Munition Rkts = Rockets

Figure 1: Sample Counterfire Log

TOC Layout. The layout must facilitate rapid information flow and cross-talk among staff members, particularly the S3 and battalion fire direction officer (FDO). The fire direction center (FDC) vehicle should be centrally located in the TOC. The FDO's battle station, the place where he sits or stands during the battle, should be where he can easily talk to the S3 yet supervise the FDC.

The TOC's operations situation map (SITMAP), the focal point of activities, also should be centrally located. If other sections maintain working maps, such as the intelligence section, TOC personnel must update the SITMAP in accordance with the unit's standing operating procedures (SOP).

Communications. The TOC's common net structure depends on the mission and equipment available. The seven inherent responsibilities of a Field Artillery tactical mission establish the nets for the four standard missions. However, in addition to these nets, the S2 section should monitor the maneuver brigade operations and intelligence (O&I) net if a radio is available.

Another useful net is the division artillery (Div Arty) counterfire net. On this net, the S2 can coordinate zone coverage with radars supporting the Div Arty when the DS battalion's Q-36 is moving or not mission-capable. Again, using this net depends on the equipment available.

Computer Setup. This setup assumes the TOC has two computers: a light-weight computer unit (LCU) with initial fire support automated system software (IFSAS) in the operations section and one in the FDC. MLRS battalions have an LCU with fire direction system (FDS) software.

Two factors have an impact on how radar acquisition information should flow into the TOC. First, the FDC should process only voice and digital calls-for-

fire—not operational or intelligence messages, such as movement orders and spot reports. Second, the Q-36 and Q-37 radars only can send messages to one subscriber at a time. To send messages to multiple subscribers, the radar crew must switch its communications system to each subscriber, increasing the time to send an acquisition. Considering these two factors, the radar should send all messages to the operations section.

The radar messages stop at this computer, with the exception of FM;CFFs. The operations section computer can be set up to automatically route FM;CFFs to the battalion FDC. This computer should be hard-wired to the FDC's LCU to prevent competition with other messages on busy FM digital nets, which could delay the information flow between the two computers.

Information Management. For the counterfire battle, the S2 maintains a counterfire log (see Figure 1). Similar to a fire mission log, this log records the information produced during the counterfire battle, including radar acquisitions tracked by the S2 or targeting officer. In addition to normal fire mission data, the log has entries to record the predicted point-of-impact and time of acquisition. In the *assess* function of

the *decide-detect-deliver-assess* targeting process, this log is an invaluable tool for the S2 to determine the effectiveness of the counterfire fight.

Decide: EFSTs

During the tactical decision-making process, the brigade commander decides what he wants to achieve with counterfire and when he wants to achieve it. He states this as part of his intent and force protection priorities, which are translated by the fire support coordinator (FSCOORD) and brigade fire support officer (FSO) into EFSTs. The EFSTs, in turn, drive the positioning of the radar and placement of radar zones.

Counterfire against a regimental artillery group (RAG), for example, is typically the DS battalion's responsibility. The DS battalion may be assisted by an R or general support reinforcing (GSR) unit in the artillery organization for combat.

The brigade fire support element (FSE) and artillery battalion staff consider several factors in organizing for the counterfire fight (see Figure 2). The bottom line for the staff is to establish a responsive counterfire system that can achieve the brigade commander's intent—accomplish the EFSTs.

- Who will be responsible for firing counterfire in the brigade zone or sector—the direct support (DS) or reinforcing (R) unit?
- To whom will the Q-36 radar send acquisitions?
- Who will receive this information message-of-interest (MOI)?
- Who will analyze the data from the acquisitions to determine and refine the template for the enemy artillery?
- Who will he report this data to, and will it be in raw or analyzed form?
- What information does the division artillery counterfire cell need to provide?
- Who will be responsible for planning, refining and cueing radar zones?

Figure 2: Factors to Consider in Organizing Artillery for Counterfire. The answers to these questions are based on the mission, enemy, terrain, troops and time available (METT-T).



Q-36 Firefinder Radar Setup at the NTC

the number of weapon systems destroyed at any time during the battle.

But a specific end state defines more than success. During the staff planning process, the required end state is the start point for determining the amount of ammunition the battalion must dedicate to counterfire. Using the number of systems to be destroyed and a standard fire order for counterfire, the staff does the battlefield calculus to determine how much ammunition is needed to accomplish the task.

For force protection, the brigade commander should state his priorities in terms of assets, functions or positions critical to the brigade's mission, and when they are critical. Because the radar only can have nine zones active at a time, the brigade commander must provide his protection priorities, based on critical locations or events. His priorities could include, for example, the breach site or zone of penetration, the main effort's battle position or a refuel-on-the-move site. By stating where he wants the priority for counterfire radar coverage, he helps ensure the coverage plan will achieve his intent.

Detect: Focusing Assets

During this function of the targeting process, the battalion staff and FSEs

focus the assets that will acquire and attack enemy artillery systems. The driving force in this step is the brigade commander's intent for counterfire. The staff's intelligence preparation of the battlefield (IPB) and the radar zone plan are the critical elements in the *detect* function.

IPB. The S2 is a key player in counterfire. He must be able to answer several key counterfire questions during IPB process (see Figure 4). The last question in the figure is the most important. The S2 must be able to portray how, when and where the enemy artillery will fire against friendly forces. It isn't enough for him to restate the definitions of the enemy's phases of fire; instead, he must answer the question in terms of time and space on the battlefield.

A useful technique is to develop a time line that depicts when the enemy artillery will move, set and fire in relation to the friendly scheme of maneuver. When briefed with the situation template (SITEMP), the time line shows when friendly artillery must be in position ready to fire and when the radar must cue. If conflicts arise between competing EFSTs or the requirement to reposition, the battalion should request reinforcing fires and (or) zone coverage from Div Arty.

The S2 and targeting officer must consider the enemy's firing of family of scatterable mines (FASCAM) and chemical munitions. Just as with our artillery, the enemy must fire large volumes of these munitions to employ them effectively. When firing chemical munitions, the enemy unit must stay in position to fire the volleys while its soldiers wear an equivalent to our mission-oriented protective posture gear (MOPP-4), which degrades their ability to fire rapidly. In terms of counterfire, this equates to a high-volume acquisition and is a prime opportunity to kill enemy artillery systems.

The radar won't acquire a "high-volume acquisition," as such. The targeting personnel determine what constitutes a high-volume acquisition. The S2

Standard Fire Order. In the artillery battalion TOC, the staff should determine a standard fire order for counterfire targets. This is primarily the work of the S3, battalion FDO and S2. The fire order must be based on analysis of the expected target type and the Joint Munitions Effects Manuals (JMEMS). The S4 also should be involved in this process to determine if any ammunition shortfalls or restrictions exist. A standard fire order determined during planning greatly speeds the delivery of fires during battle.

EFST Format. The brigade commander's intent for counterfire is stated in a force protection EFST, using the task, purpose, method and end-state format.

A well-defined end state is particularly helpful in planning for the counterfire fight. The end state should be expressed as a number of enemy artillery and (or) mortar systems destroyed. If the commander wants these systems destroyed by a certain point in the battle, this should be stated in the end state.

For example, the commander may desire an end state of "18 weapon systems of the RAG destroyed prior to Phase III breaching operations" in an offensive operation. This also could be expressed as a percentage—say, 50 percent of the RAG—with the staff computing the exact number of systems based upon the expected composition and strength of the RAG. Figure 3 is an example of a counterfire EFST.

A specific end state does two things for the battalion staff. First it helps define when the artillery battalion has succeeded in the counterfire fight. The S2's analysis of acquire-to-fire times and the volume of fires delivered against the enemy's artillery helps him estimate

Task: Destroy the RAG

Purpose: To provide force protection to the brigade's support-by-fire and breaching force during Phase III breaching operations.

Method: DS fires Bn 6 volleys DPICM per acquisition.
MLRS fires 12 M26 rockets per acquisition.
Q-36 is positioned to acquire the templated RAG.
Supplemental Q-37 coverage is coordinated for.

End State: 18 systems/50% of the RAG destroyed before Phase III starts; RAG is suppressed during breaching operations.

Legend:

Bn = Battalion
 DPICM = Dual-Purpose Improved Conventional Munition
 DS = Direct Support
 MLRS = Multiple-Launch Rocket System
 RAG = Regimental Artillery Group

Figure 3: Sample Essential Fire Support Tasks (EFSTs) for Counterfire

should recognize this when the predicted impacts of a large number of acquisitions are at the same grid or in its vicinity. Based on the enemy template for FASCAM and chemical strikes, he can assess what munitions may have been fired.

The S2 can use this data to inform friendly forces of the danger and, in conjunction with spot reports from other units, to confirm or refine his assessment of the enemy's plans. If he has accurately templated these strikes in time and space during the IPB, both the radar and firing units will be in position to respond effectively and destroy the weapon systems firing the munitions.

Radar Zone Plan. A good zone plan—one based on the enemy situation and friendly scheme of maneuver that has been waged, rehearsed and properly linked to a firing unit—is the critical element in the counterfire fight.

The zone plan, just like the fire plan, is a top-down process, starting with the brigade FSO and ending with zone refinement from the bottom up. (This article doesn't cover the TTP for zone planning in the close fight. For such a discussion, see the article "Radar Zone Management in the Close Fight" by Chief Warrant Officer Two Donald F. Cooper in the "National Training Center's Fighting with Fires" Center for Army Lessons Learned (CALL) Newsletter, Number 95-6, May 1995.)

A good zone plan has several characteristics. First, the plan satisfies the brigade commander's intent. Each zone has a clear purpose and a cueing agent who can best determine when to turn on and off the radar or refine that zone. The zones have a clear trigger based on a friendly or enemy event. Communications are established among the sensor, shooter and cueing agents. The fire support plan identifies clear attack guidance for the designated shooter when the zone is violated by enemy fires. Finally, the zone plan has been *wargamed* and *rehearsed*.

Deliver: The Counterfire Battle Drill

The counterfire battle drill is executed as a reaction to an acquisition sent to the TOC by a counterfire radar. The TOC receives an acquisition via two methods. The first is when enemy fires violate a CFFZ or a CFZ, generating a digital call-for-fire message (FM;CFF). The second method results from enemy

- What is the disposition, composition and strength of the RAG and (or) DAG, including the number of systems by type of weapon?
- What are the capabilities of these weapons (emplacement and displacement times, range and type of munitions they can fire)?
- What is the counterfire threat against friendly artillery (how the enemy will acquire and attack us)?
- What is the ELINT threat (enemy's systems that can locate and target the radar)?
- How will the enemy commander employ his artillery (phases of fire, possible position areas and any special munitions, such as FASCAM or chemical fires)?

Legend:

DAG = Divisional Artillery Group FASCAM = Family of Scatterable Mines
ELINT = Electronic Intelligence RAG = Regimental Artillery Group

Figure 4: Counterfire Considerations During the Intelligence Preparation of the Battlefield (IPB) Process

fires violating an artillery target intelligence zone (ATIZ) or when those fires are detected in the radar's search fence but do not violate an active Firefinder radar zone. This second method generates an artillery target intelligence message (ATI;CDR). Both methods result in the execution of similar procedures.

Ideally, the TOC processes the call-for-fire or ATI message within one minute—a tough standard. The time starts when the TOC receives the acquisition and ends when the FDC transmits the call-for-fire to the unit to fire. Many actions must occur in this time, but units can meet the standard with enough training.

FM;CFF Processing. This call-for-fire message enters the TOC through the operations section computer. The message is automatically routed to the FDC LCU. When the call-for-fire is displayed on the screen, the FDC computer operator announces, "Fire Mission!" This alerts the remainder of the TOC to start the counterfire battle drill. The FDC operator then reads aloud the following data: target number, target grid location, target type and time of receipt. The designated recorders enter the data in the FDC fire mission log and counterfire log.

As the operator reads off the target location, the battle captain, battalion S2 and FDO check and plot it simultaneously. The battle captain plots the grid on the operations SITMAP to check for any fire support coordinating measure (FSCM) violations. If the target does not violate an FSCM, he announces, "Target number _____, clear!" If the target violates an FSCM, he announces, "Target number _____, not clear; violates FSCM [the reason why it isn't]."

He then tries to clear the target through doctrinal channels.

The S2 also plots the target on the SITEMP to determine where the enemy fires originated and what weapon system or unit may have fired. He then announces the result as, "Target number _____, RAG [or specific type of weapon]." He can have the recorder enter this determination in the counterfire log for battle tracking and periodically assessing the results of the battalion's counterfire efforts.

The FDO also plots the grid to conduct two checks. The first is a backup clearance-of-fires check. (The battle captain's clearance check is the primary check.) The second check determines which unit(s) can range the target. He then determines which unit is available to fire. If a unit is in range and is available to fire, the FDO announces "Target number _____; A Battery [the unit]."

The FDO then formulates his fire order. A standard fire order greatly expedites this process. The FDC computer operator can make the appropriate entries in the message format and await the command to send it to the unit to fire. If the battalion can't attack the target, the FDO announces, "Target number _____; out of range [the reason why]."

The reason for announcing the results of the three checks is to provide the S3 the information he needs to approve or disapprove the fire mission. If the target meets the attack guidance, is cleared, a firing unit is available and no other EFSTs have priority, the target is approved. The S3 then commands, "Fire target number _____!" If the S3 disapproves the target for attack, he must

issue guidance to the FDO concerning what to do with the mission (e.g., send it to a reinforcing unit).

The FDC takes the appropriate action by sending the mission to the unit to fire (or wherever the S3 directs). Recorders update their respective logs and await the mission-fired report.

ATI;CDR Processing. The battle drill procedures for processing the artillery target intelligence message are similar.

The ATI;CDR arrives at the operations section computer. When the message is displayed on the screen, the IFSAS operator announces, "Acquisition!" This alerts the remainder of the TOC to start the counterfire battle drill and that ATI;CDR data will follow.

The operations section computer operator then reads aloud the data from the message format: target number, point-of-origin location, point-of-impact location, time of acquisition and target type. Recorders make the appropriate entries on their forms.

The battle captain, S2 and FDO make the same checks and announce the same information as described for an FM;CFF. In addition, the S2 and battle captain plot the point-of-impact to determine what friendly units are affected by the enemy. This can help in prioritizing which acquisitions to fire first. Clearance of fires is especially critical in processing an ATI;CDR. These acquisitions can occur anywhere in the radar's search fence without regard to coordinated radar zones or FSCMs.

The S3 also must approve the acquisition as a fire mission. He uses the same criteria listed before. If approved, he directs the FDO to fire the target; if not, he issues guidance to the operations section computer operator. If the mission is disapproved the operator sends the ATI;CDR to the appropriate unit or ends the mission.

If approved, the operator processes the ATI;CDR, sending it to the FDC. When the acquisition, now an FM;CFF, is displayed in the FDC computer, the operator and FDO verify the target number as the same as the ATI;CDR just cleared and approved. (New FM;CFFs could come into the FDC that start the counterfire battle drill or that may be calls-for-fire against maneuver targets.)

If the target number matches the approved ATI;CDR number, the FDO issues his fire order. The FDC computer operator makes the appropriate entries and then transmits the mission to the unit to fire. Recorders then update their logs.

MFR Processing. In MLRS units, the mission-fired report (MFR) ends the counterfire battle drill for a specific target. When the MFR is displayed or reported to the FDC, the computer operator announces "MFR, target number _____; A Battery fired at 1403 12 rockets [time the unit fired and any changes to the fire order originally sent to the unit, particularly the number of rounds, or rockets fired]."

For cannon battalions, a report from the battery FDCs that the target was fired will end the counterfire battle drill. Recorders complete the entries in their logs for that target. The FDC updates the battalion's ammunition status. The TOC reports in accordance with its SOP. If the firing unit must move or reload, the FDO notes when that unit will be available to fire again.

Assess: Counterfire Effectiveness

The staff *assesses* the effectiveness of the counterfire fight, starting with a review of the counterfire log. Assessment is an ongoing process, not something done only after the battle. To estimate the damage to the enemy's artillery systems, the staff must have several pieces of information: the friendly force acquire-to-fire times (time of the acquisition to the time the unit fired), enemy weapons emplace and displace times, JMEMs predicted effects on enemy artillery, an assessment of friendly artillery fires accuracy, and enemy fires points-of-origin and points-of-impact.

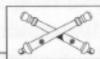
The time of the acquisition is determined two ways. It's an entry in the ATI;CDR format that shows when the radar actually acquired the target. For an FM;CFF, the S2 uses the time the radar sent the message to the operations section computer in the FM;CFF format. (The FM;CFF message does not have a time of acquisition.) The time won't be exact because the radar crew has processed the zone violation before sending it to the battalion to fire. The targeting officer or radar section chief can tell you how long it takes his crew to process an acquisition. You can add this time to the time the message was sent to determine an approximate time of acquisition.

Using the counterfire log, the S2 can keep a running count of how many enemy systems may have been destroyed by counterfire. He can periodically update the commander and staff. Unless

the S2 can confirm the battle damage assessment (BDA) through "eyes-on" reports, this is only an estimate.

Armed with this knowledge, the S3 can assess whether or not the battalion has succeeded as defined by the EFST. He may advise the FSCOORD on whether to continue the counterfire fight or shift priority to other EFSTs that compete for limited resources. The staff also uses this data to refine the radar zone plan. The S2 uses the information from the counterfire log to confirm or refine the SITEMP. If the CFFZs have not been properly placed, the staff can coordinate and refine their locations to account for the updated enemy situation. This also is a continual process during the battle. If the enemy has moved, so must the CFFZs.

When a Field Artillery TOC sets the conditions that allow for a fast, efficient battle drill and trains to standard, the effects on the enemy can be devastating. The goal is to provide rapid force protection through a focused counterfire battle that meets the brigade commander's intent.



Captain Robert D. Kirby is the Live-Fire Fire Support Trainer and also has served as the Battalion Fire Direction Center Trainer at the National Training Center (NTC), Fort Irwin, California. In his previous assignment, he was the Fire Support Officer for the 1st Battalion, 72d Armor in the 2d Infantry Division, Korea. Also in the 2d Infantry Division, he commanded B Battery, 6th Battalion, 37th Field Artillery (Multiple-Launch Rocket System) and served as the battalion's Assistant S3. Among other schools, he's a graduate of both the Field Artillery Officer Advanced Course at Fort Sill, Oklahoma, and the Infantry Officer Advanced Course at Fort Benning, Georgia.

Chief Warrant Officer Three Robert A. Nelson, Jr., is the Combat Radar Trainer in the Fire Support Division at the NTC. He also served as an Instructor/Writer for the Warrant Office Basic and Advanced Courses in the Fire Support and Combined Arms Operations Department of the Field Artillery School at Fort Sill. In V Corps Artillery in Germany, he was the Targeting Officer for the 41st Field Artillery Brigade and Radar Technician for A Battery, 25th Field Artillery. Among other assignments he was a Radar Technician in C Battery, 25th Field Artillery for the 2d Armored Division at Fort Hood, Texas, and in the Gulf for Operations Desert Shield and Storm.