Field Artillery

A Professional Bulletin for Redlegs

June 1989

Gas, Beans and Bullets

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Articles

Features

Field Artillery Hotlines

- Unit Training Hotline—AV 639-5004 or (405) 351-5004: ARTEP, AMTP, SQT, MQS, TEC and ACCP.
- Redleg Hotline—AV 639-4020 or (405) 351-4020: NTC, JRTC and Other Artillery Subjects.

PURPOSE (as stated in the first *Field Artillery Journal* in 1911): *To publish a journal for disseminating professional knowledge and furnishing information as to the Field Artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.*

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To Fix, Feed, Fuel and Fire

Let's assume the Soviets can support their massive artillery army logistically. Historically, they've done it time and again using the most primitive forms of transport. And they're getting better, not worse. If you accept this premise, certain operational priorities come to the fore:

- Logistical operations become as important as tactical operations—if not more.
- Automated distribution systems must push more preconfigured ammunition loads farther forward faster.
- Maintenance assets must be distributed so we can fix farther forward faster.
- Training to support as we will in war must be a mission-essential task to be performed at doctrinal distances for realistic quantities of materiel.

This issue offers ways to meet these priorities, from a platoon leader's observations by Second Lieutenant Ronald R. Haddock through a battalion-level doctrinal blueprint by Colonel Vollney B. Corn and Major Lawrence R. Adair to a Logistics Center overview of how the entire system works now and will in the future by Lieutenant General William G.T. Tuttle, Jr., and Captain Diane D. McIntyre.

The Field Artillery has given considerable attention to fire support coordination for some time. We hope this issue of *Field Artillery* generates similar discussions about an equally important element of success on the battlefield—logistics.

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On the Move

MAJOR GENERAL RAPHAEL J. HALLADA

Sustaining Fires

Shoot, move and communicate: that's a theme you've heard many times, and rightly so, because these key words express what we traditionally do in the Field Artillery. Implicit, though, in each of these functions is the need for support—ammunition, fuel, maintenance, supply and personnel.

Support and sustainment are vital—that's undeniable. They form one of the four major components of the Field Artillery System of Systems. Yet it is, unfortunately, an aspect of our business that often doesn't get the attention it deserves.

Battle-Focused Training

FM 25-100 Training the Force requires us to take a battle-focused approach to our peacetime activities, to "train as we will fight." It's equally imperative in training that we *support* as we will *during the fight.*

In selecting his unit's mission essential tasks, a commander will undoubtedly include support tasks. Even so, the mindset is often, "Sure, we do that anyway"—therein lies the problem. We shouldn't look upon support functions as necessary burdens, but rather as ***opportunities for battle-focused training.***

Realism. In training, the support and sustainment functions, perhaps more than any others, parallel their combat equivalents. The need for maintenance and supply is real—they don't require any notional concepts. What they do require, however, is some innovation, planning and effort to ensure support remains a part of the overall training, not a sideline activity.

Support personnel must perform their missions under essentially the same conditions they'll experience in wartime. Our S4s and combat service support (CSS) representatives, guided by commanders and S3s, must prepare to meet the demands of intense and continuous combat spread over large areas of operations. They should be deeply involved in planning and establishing resource priorities.

In training, they must monitor the "battle" as part of the planning team, anticipating the needs of our units. They must push needed support forward rather than wait for requests. Repairs or adjustments that can be "fixed forward" should be. Units should experiment with and practice using push packages, "hot" or "on-the-run" refueling and rearming, maintenance collection points and unit and supply-point distribution systems.

Survivability. Critical to continuous combat sustainment is the survivability of support elements. With the fluidity and depth of the battlefield, the threat to the rear areas is very real. Again, the key is properly integrated, battle-focused training. Too often we allow the support personnel to develop the notion that the "war games" are elsewhere and don't involve them. We foster the attitude that they're there to support training, not participate in it, that their "real" jobs of fixing and supplying are somehow more important than other training challenges. This is simply not good enough. We **must** give tactical training in our support areas more than lip service.

In selecting sites, S4s and other CSS officers must think survivability as well as mission accomplishment. They must choose terrain that allows for adequate security, cover and concealment. Considering how an area will be improved and reinforced with obstacles is mandatory. They must avoid obvious high-speed avenues of approach (armor and aircraft) and lay out the area, keeping in mind dispersion and routes into and out of the area.

In training, we should subject support troops to more than just token aggressor actions. They should practice battle drills to counter various types and levels of threats, to include dismounted infantry, spetznatz, armor, artillery, air and chemical attacks. Practice in casualty triage and evacuation is also essential. We must give the individual soldier instructions on and make him perform to standard combat tasks, such as preparing fighting positions, donning personal camouflage and administering first aid.

Sustainment. Gaining proficiency in combat sustainment doesn't come easily. With emphasis naturally falling on tactical and weapons training, we must force the issue to practice wartime support skills. Exercises such as return of forces to Germany (REFORGER) and rotations at our combat training centers provide excellent opportunities to practice supporting as we will in combat. Smaller-scale field training exercises can, again with some innovation and willingness, provide such opportunities as well.

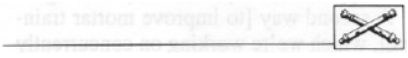
Several initiatives in the Field Artillery promise to improve our support and sustainment capabilities.

- The Field Artillery ammunition support vehicle (FAASV) improves howitzer ammunition handling, thereby increasing the volume of fire available from our weapons. Its design reduces manpower needs and increases crew protection. Also, 65 percent of its parts are common to the M109-series howitzer, reducing inventory requirements.
- The palletized loading system (PLS) and the maneuver-oriented ammunition distribution system (MOADS) will improve ammunition resupply capabilities.
- The multiple launch rocket system (MLRS) was designed with ease of maintenance and rearming in mind. The vehicle will serve as a common-carrier chassis for both the MLRS and the Army tactical missile system (Army TACMS), again shrinking the logistical base needed to maintain the two systems.

We built enhanced survivability into the FAASV, the MLRS and the M109 howitzer improvement program (HIP). These measures allow the vehicles to better withstand the rigors of combat and, when damaged, be quickly repaired and returned to service.

Conclusion

Dependable, responsive and continuous support, capable not only of keeping up with the battle, but also of anticipating needs, is an essential part of fire support. But, just as with tactical skills, successful wartime support requires tough, realistic battle-focused training **NOW.**



Incoming

LETTERS TO THE EDITOR

Response to "NTC: Fire Support Trends and Fixes"

I found Lieutenant Colonel [William R.] Brown's article "NTC: Fire Support Trends and Fixes" (December 1988) to be a clear and accurate portrayal of many of the problems fire support personnel experience during NTC [National Training Center, Fort Irwin, California] rotations. Lieutenant Colonel Brown provides some good recommendations for solving those problems. However, I disagree with his solution to the difficult task of revising a fire plan.

He notes that fire support plans aren't always revised with available "late-breaking intelligence." He identifies the difficulty FSOs [fire support officers] and FDCs [fire direction centers] have in managing revised target lists, groups of targets and schedules of fire. His solution is "rather than creating new target numbers, schedules and new groups of targets, we should change just the grids for the target numbers we already have."

Although not doctrinally incorrect, changing the grids for targets while the target numbers remain the same is a potentially dangerous practice. Lieutenant Colonel Brown is correct in saying it "could minimize the disruption to the fire support plan that we've rehearsed" in that an FSO or FDC wouldn't be confused by new target numbers. But if an FDC is confused with changing target numbers, how confused will it be with changing grids? What happens when an FDC or FSO fails to receive the changes?

Adding and deleting targets confuses some, while others sometimes don't get the changes at all. This situation can be ironed out during rehearsals. But if a rehearsal before execution of the fire plan isn't possible because of time constraints, then those problems can be discovered only during the execution. This may not seem like an acceptable situation, but I submit it's better than finding out an FDC was confused or didn't receive changed grids when rounds are impacting in the wrong locations. This is very likely to occur when grids alone are changed.

The time and effort required to revise targets, groups and schedules is greater than that required to change the grid locations of targets. It's worth the time, however, when considering the possible results of the latter course of action.

The solution to this problem is for fire support personnel to rehearse (and rehearse and rehearse) fire plans before their execution while remaining flexible enough to accept changes to fire plans. In addition, all participants in the fire plan must work to ensure complete dissemination of changes. When an FDC fails to receive changes to the fire plan, the result shouldn't be unsafe fires.

Captain William A. Meidenbauer, FA
Fire Support Trainer
NTC

Response to "Mortars—A Field Artillery Weapon"

In "Mortars—A Field Artillery Weapon" (Incoming, February 1989), Major James O. Harrison III proposes moving mortars to Field Artillery. Most tankers and infantrymen strongly oppose any changes of this nature, as do a considerable number of Redlegs who truly understand how valuable mortars are to a maneuver commander.

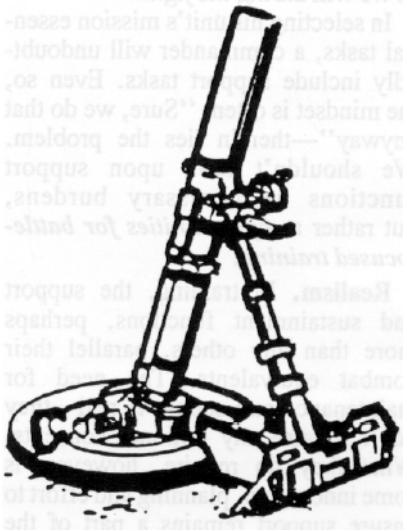
Major Harrison has identified training as a major weakness in many units. I completely agree. Clearly, most maneuver commanders need to pay more attention to mortar training. Major Harrison may be right in saying that the technical skills of individuals and units might increase if artillerymen were involved. However, involvement of artillery personnel can occur today without drastic organizational changes.

The simplest way is to make the battalion fire support officer a key player in mortar training both in the field and in garrison. As the battalion commander's chief advisor on all fire support matters, his involvement would be welcomed. The fire support officer also would gain a better insight into the capabilities and limitations of the unit's only organic indirect fire system. This initiative will go far in addressing concerns Major Harrison expressed, such as "mortars aren't well integrated into fire support plans because they aren't integrated into fire support officer (FIST/FSO) training."

A second way [to improve mortar training], which we're working on concurrently with the Infantry School, is to increase the involvement of commanders in mortar training. That's certainly a tough nut to crack, given the many competing requirements; but we are getting better. Battalion commanders who show a high level of awareness for mortars in garrison probably won't forget them as quickly in the field. Aggressive fire supporters help us greatly in this area. Incidentally, I used both these approaches while commanding the 1st Brigade, 1st Armored Division, during the 1983 to 1985 time frame. It worked!

Whereas moving mortars to artillery might increase the technical skills of individuals and units, technical proficiency isn't the most critical problem in lashing up maneuver and fire support; employment and synchronization are. Regardless of who writes the manuals or administers the ARTEPs [Army training and evaluation programs], the maneuver commander, frequently on advice from his S3 and FSO [fire support officer], must decide when to move mortars, whether to split the platoon and what targets they will and won't engage.

These responsibilities are all rolled up in the give and take process of understanding the commander's intent, providing professional and sound advice on capabilities and limitations of attack systems and turning that entire interchange into well-timed and well-coordinated actions on the battlefield. We must never forget that *FM 100-5 [Operations]* charges *commanders* with integrating



fire support into their plans. Moving mortars farther from the immediate control of commanders will stand only to complicate that process.

Finally, Major Harrison believes mortars lack flexibility because they belong to the maneuver unit. He talks of task organizing mortar units and higher commanders' influencing the battle by using a reserve task force's only indirect fire assets in support of someone else's battle. These ideas have always been and will continue to be non-starters among Armor and Infantry soldiers, and rightfully so, because the true

strengths of mortars are their assured availability and responsiveness to maneuver commanders. It is from these advantages over other systems, including Field Artillery, that mortars derive their flexibility. Certain combat situations may leave higher levels with no option but consolidation, but normal operations must be planned on the premise that mortars fight for specific battalion and company commanders. This applies equally in both heavy and light forces.

Close Support Study Group IV, in progress at Fort Sill, is examining closely the roles and employment of mortars in Air-Land Battle. We at the Armor School will be looking closely at the recommendations this forum provides us on how to improve our synchronization and enhance our ability to focus the combat power of these critical assets.

In the meantime, however, we need the combined efforts of maneuver commanders and fire supporters to make our current organizations more effective. There is plenty of work out there for all of us. We can argue later over who should get to take the game ball home.

Colonel A. W. Kremer, Jr., AR
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[Fort Knox, KY

Another Response: Are Mortars *Really* A Field Artillery Weapon?

From the standpoint of at least two of his "maneuver brethren," Major Harrison's solution to the "ineffective use of battalion and company mortars" seems, at worst, a cop-out and, at best, self-serving. His argument (which, by the way, isn't a new one) for placing mortars in the Field Artillery is narrow and somewhat specious. He loses sight of the fact that mortars support ***battalions*** and, by virtue of that fact, were never intended to be Field Artillery weapons. While he's quick to take the maneuver arms to task for "inadequate training," Major Harrison conveniently overlooks the Field Artillery's responsibility in this regard. His challenge (if it's real, and he isn't just throwing out bait to see what he can catch) can't go unanswered.

Doctrine. As set forth in *FM 6-20 [Fire Support in AirLand Battle],* the Field Artillery's own "bible," the mortar mission is "to provide immediate and close supporting fires to the maneuver forces in contact." The key point here, missed by Major Harrison, is that this mission isn't identical to the Field Artillery mission. Accomplishment of the mortar mission mandates a responsiveness that can only be achieved by having these close-support weapons under the direct control of maneuver unit commanders. (Whether that's best accomplished at battalion or company level is another perennial argument, albeit an Infantry one, best left for another day.) Taking mortars away from maneuver battalions will decrease the responsiveness of these weapons and, hence, significantly diminish the ability of mortar units to accomplish their mission.

Whether they belong to the Infantry or the Field Artillery, our current mortars, because of their relatively short range, are best suited to support the maneuver unit at battalion level and below. Contrary to Major Harrison's assertion that mortars at the maneuver battalion level result in "no flexibility," the effect is precisely the opposite. What obviously displeases Major Harrison is the flexibility belongs to the maneuver commander, not the Div Arty [division artillery] commander, and because mortars are a battalion-level fire support system, that's where the flexibility belongs. The maneuver battalion commander has unlimited flexibility to move mortars and their fires anywhere within his area of operations and faster than could be accomplished were they division assets. Indeed, although he rarely does so, the brigade commander can attach and detach mortar platoons at his discretion to adjust the combat power within the brigade area.

His statement that "consolidation would enable the division artillery commander to task organize all his fire support assets... something he can't currently do," indicates Major Harrison's apparent belief that mortars are Field Artillery weapons. Nothing could be further from the truth. Although mortars are an indirect fire support asset, the mortar mission, per FM 6-20, isn't the same as the Field Artillery mission, any more than the missions of other fire support assets—naval gunfire, tactical air, Army aviation and electronic warfare, to name a few—are the same as the Field Artillery mission.

Withdrawing mortars from maneuver units and consolidating them into battalions within the Div Arty is certainly not the answer to the question of how to employ mortars better. Again, mortars support maneuver battalions; it's unlikely the Div Arty commander would find mortars to be a suitable division asset for preplanned fires, given their high angle of fire, short range, less sophisticated fire control systems and the fact that their positions aren't surveyed—all resulting in reduced accuracy. The 60-mm mortar is particularly unsuited for preplanned fires because it employs chiefly line-of-sight fire control methods.

Consolidation would cause undue headaches for both maneuver and Field Artillery commanders. It would prove to be unwieldy at the very least, given that it would require a command and support relationship be established with the maneuver battalion. Currently, the maneuver battalion simply owns the assets. Furthermore under such a concept, the logistical burden on the artillery would be increased unless mortars were attached to the maneuver unit—a course of action the artillery habitually avoids and that would merely create the same command structure that currently exists.

As Major Harrison duly notes, it's true that in the late 1950s to early 1960s mortar batteries under Field Artillery ownership were organic to the airborne battle groups. However, these were larger (4.2-inch) mortars of longer range, which adhered predominantly to Field Artillery procedures, to include having their positions surveyed. One of the reasons (although not stated explicitly at the time) the Field Artillery "gave up the ghost" and these mortars reverted to the Infantry was because Field Artillerymen weren't enamored with them.

Major Harrison also points out that Soviet motorized rifle divisions have mortar batteries, but he neglects to note *they are in the maneuver battalions.* While the Soviets also have mortars at higher echelons *(front),* these weapons have ranges considerably longer than those of our own mortars, and hence, they have different missions.

The author also states that when a maneuver unit is placed in reserve, its mortars go into reserve with it. True, but this doesn't violate the precept that artillery is never placed in reserve, as Major Harrison would have us believe. *Mortars aren't Field Artillery weapons!*

In any case, under AirLand Battle doctrine, a unit can't afford the luxury of remaining "in reserve" for very long; in many instances, the

"reserve" maneuver unit is the one least committed. Moreover, should a unit find itself in reserve, it's probably preparing for some other contingency on the battlefield, and it must retain control of its mortars so they can be immediately responsive when the unit is committed.

Finally, under the heading of doctrine, a cardinal point to be made is that the Field Artillery ***is*** responsible for ***all*** fire support doctrine, notwithstanding that it doesn't own all the indirect fire support assets on the battlefield (tactical air, attack helicopters, naval gunfire and, of course, mortars). Thus, the author's assertion that mortar doctrine is developed "in a virtual vacuum from the Field Artillery Center" is hardly the case. True, as he states, there are two separate schools involved, but both USAIS [US Army Infantry School, Fort Benning, Georgia] and USA-FAS [US Army Field Artillery School, Fort Sill, Oklahoma] fall under the purview of the Combined Arms Center [Fort Leavenworth, Kansas], whose task it is to coordinate and integrate the doctrine of these and the other combined-arms schools. Moreover, mortar doctrine is developed under the broader umbrella of fire support doctrine; USAFAS publications such as FM 6-20 and *FM 6-30 [Observed Fire Procedures]* get every bit as "dog-eared" in a mortar platoon as they do in a howitzer battery.

As for synthesizing this doctrine and putting it into practice on the battlefield, the key individual in coordinating the maneuver commander's fire support plan is the fire support coordinator (FSCOORD); at the maneuver battalion level, this is the fire support officer (FSO). Therefore, if mortars and, by implication, other fire support assets aren't coordinated and integrated into the overall plan, it can hardly be attributed only to "inadequate training" on the part of maneuver units.

Training. In stating the "Field Artillery Center can train mortarmen...in a standardized manner," Major Harrison implies they aren't so trained by the Infantry Center. Of course this isn't true, since all personnel in MOS 11C are trained to a standard USAIS program of instruction. Field Artillery personnel do have a role to play here, however, by instructing all infantrymen (not just mortarmen) in Field Artillery tasks—observed fire procedures, fire support coordination and the like. This is the Field Artillery's forte.

Major Harrison is quick to point the finger at the training deficiencies of mortar units; he neglects to mention, however, that many Field Artillerymen, although adept at employing artillery, are unfamiliar with the employment and adjustment of mortars as outlined in USAFAS publications. The FSCOORD is—or should be—the maneuver commander's staff expert for *all* fire support systems and matters; if the FSCOORD focuses on Field Artillery to the exclusion of other fire support assets, then certainly, mortars won't be employed optimally.

When it comes to training mortarmen, there's adequate culpability to go around. Both of us, as maneuver unit commanders, often wished our FSOs were available more often to assist in imparting the principles of fire support to the members of our units. Unfortunately, artillery units, just like infantry units, are faced with competing priorities.

Combined-Arms Teamwork Is the Answer. To give Major Harrison his due, this isn't a simple problem. Neither, however, is the solution so simple as suggesting a branch transfer for mortars.

That maneuver commanders don't employ their mortars effectively is regrettable and, in many cases, true. The blame for this shortcoming can't rest solely on the shoulders of the Infantry and Armor, however. Although a maneuver commander is ultimately responsible for employing all indirect fire systems (let's not forget the division commander "employs" the Div Arty), the maneuver leader at every level from platoon through corps has a Field Artilleryman to assist and advise him in planning and coordinating ***all*** fire support, including mortars. So, if mortars aren't well-integrated into the battalion fire support plan, where does the fault lie? Perhaps the maneuver commander isn't receiving sound advice from his FSO, who may be inexperienced or underqualified for the job. In any event, taking mortars away from the maneuver units would only exacerbate the situation. The maneuver commander is still ultimately responsible for employing mortars; can he realistically be expected to employ them better than he does now, if they don't "live and train" with him?

Any maneuver battalion commander worth his salt knows he can bring more combat power to bear on the enemy by talking to his FSO than by talking to his company commanders. Of course, the battalion commanders who don't know this are the ones we need to worry about. The answer isn't to point fingers or take their mortars away from them; it's to work together to teach them how to employ those weapons effectively.

So, it seems to us the solutions to the problems posed by Major Harrison require a solid combined-arms approach. Maneuver officers should be proficient at employing ***all*** fire support assets, not just mortars. If they aren't proficient, however, Field Artillerymen, the experts on planning and coordinating ***all*** fire support, must assist in teaching and training those maneuver officers.

From an infantryman's perspective, maybe the best way to accomplish this combined-arms operation isn't to take away fire support assets, but to give the maneuver unit *more* of them—in the form of FSOs and FISTs [fire support teams] permanently assigned to maneuver battalions!

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Captain Jeffrey A. Jacobs, IN
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Response to "Fight the 8-Inch Demise"

The letter by Major [Leon D.] Vaupel [April 1989] supports the Field Artillery's position that the 8-inch howitzer is a "good old gun," 25 years old to be exact. But before I go any further, let me provide everyone a condensed version of an analysis that was performed with regard to the 8-inch howitzer, and they can decide for themselves what the artillery should do with its force.

The Threat's artillery poses the most danger to the US Army's Field Artillery systems and to our maneuver forces during prep fires. It's apparent the artillery is the keystone of the Threat's combined-arms architecture. For the past 10 years while the Threat has increased its tank force by only 13 percent, it has increased its artillery force by 63 percent with emphasis on an armored self-propelled force. By comparison, the US Army's artillery has grown only by nine percent over the same period.

Threat doctrine relies heavily on artillery to generate the requisite correlation of forces. The Threat will rarely have the maneuver forces needed to generate the correlation of forces it believes necessary to conduct successful offensive operations unsupported by artillery. Because of this, we must destroy its artillery to win the close battle.

With a fixed-force structure, the Field Artillery must rely on more efficient and effective systems to meet the challenge placed before it. Current systems with DPICM [dual-purpose, improved conventional munitions] require too many rounds and too much time to defeat the Threat artillery effectively. This results in the US artillery's attrition below the level that will allow our limited numbers to withstand the echeloned forces the Threat is capable of producing.

Basically, there are three things that can be done to improve our position, given our present force.

1. Improve the survivability of the system.
2. Increase the lethality of the system with—
   - Increased rates of fire.
   - More lethal munitions.
3. Field more systems.

Improving the survivability of the 8-inch was considered and, although the system survived significantly better with a crew ballistic shelter, it didn't provide a corresponding increase in effectiveness to the force as a whole, due largely to part of the second factor—rate of fire.

Rate of fire, in this case, refers not only to the number of rounds per minute the gun can fire, but also to its inability to emplace and displace as rapidly as the MLRS [multiple launch rocket system] or M109 HIP [howitzer improvement program]. Even with HIP-like enhancements, the 8-inch would have physical restrictions that would slow it down. Functions such as taking the tube out of travel lock, putting the tube in battery, removing section boxes and emplacing the spades limit the 8-inch howitzer's ability to match the HIP's mobility and rate of fire. The future battlefield will require increased numbers of moves for survivability, and excessive move time means nonfiring time.

Current "dumb" munition lethality is about equal for the 155-mm and and 203-mm HE [high explosive] or DPICM on most targets, over time, given the faster rate of fire achieved by the M109 HIP. However, when "smart" munitions such as SADARM [sense and destroy armor munition] are introduced, the 8-inch falls behind in only a few hours. This is because of the closer performance characteristics of the 155-mm and 203-mm SADARM rounds, fewer missions being fired and fewer rounds readily available at the gun (48 versus 129).

Finally, why not just buy more 8-inch systems? Manpower! We have to grow from within, and the only way to do that is to evaluate the overall contribution of each

system against its total manpower requirement. The 8-inch units can provide the manpower to enhance the corps and divisions commanders' artillery effectiveness. By replacing the 8-inch howitzers with MLRS, the manpower ratio of soldier-to-weapon system is reduced from 28:1 to 17:1. And by fielding more MLRS and M109 HIP systems that are individually more effective, the artillery can win the counterfire battle. (The HIP is an interim howitzer until the advanced Field Artillery system—AFAS—is developed.) Therefore, the artillery must take "good old systems" that are manpower-intensive and better use that vital commodity—the soldier—to create a more effective total force (i.e., more systems for the same number of soldiers).

What about the 8-inch system's range, accuracy, MOUT [military operations on urbanized terrain] and the nuclear issue?

- **Range.** The MLRS M26 rocket and the M109 HIP M864 round both exceed the 8-inch range with DPICM.
- **Accuracy.** There's no significant difference between the 8-inch and the M109 HIP.
- **MOUT.** For pure effect against manmade structures, the 8-inch munition is more effective than the 155-mm munition. However, the 155-mm munition is adequate. In addition, the utility of the 8-inch in urban conflict is limited by its flat trajectory. The M109 HIP's ability to provide high-angle fires is more useful in that type of combat.
- **Nuclear mission.** There are other systems that can perform this role and achieve the desired effects.

In conclusion, the Field Artillery must improve its capability to meet the demands of the counterfire battle. We can't add new systems without an increase in manpower; therefore, we must use the force structure we have to our greatest advantage. The 8-inch force structure provides that capability. If we expand the number of systems within the Field Artillery without increasing the force, we achieve a more effective force and meet a long-term goal of the Field Artillery by creating a single-caliber cannon force for the heavy divisions (155-mm).

Major Benny R. Shelton, FA
Directorate of Combat Developments
Field Artillery School

"We'll re-create what happened if you promise not to laugh."

Response to "Soviet Artillery: Myth versus Reality"

As a Threat Instructor and MI [Military Intelligence] officer, I have some problems with the impact of the article "Soviet Artillery: Myth versus Reality" [by Michael D. Holthus] in your April issue. The author does an effective job of destroying the myth of Soviet technological inferiority. In fact, he takes the perception too far in the other direction. While expounding on all the wonderful features of the 2S1, for example, the author neglects to mention that, while the use of metal cartridge-type munitions makes it possible for the 2S1 to have a machine-assisted loading cycle, it also causes the howitzer to break the NBC [nuclear, biological and chemical] seal whenever it fires. Thus, the 2S1 can operate safely in an NBC environment until it does the one thing it was designed to do on the battlefield—shoot. In addition, the artillery-dedicated spotting helicopter uses one of the oldest Soviet helicopters, the MI-2, which is in no way comparable to the OH58D.

The Soviet 2S1 122-mm self-propelled howitzers break their NBC seals when they fire.

Soviet artillery headquarters still primarily operate manually. The current computer system in the field only computes fire missions at the *battalion* level and doesn't tie together the guns, RSTA [reconnaissance, surveillance and target acquisition] assets, etc., as TACFIRE [tactical fire direction system] does.

New systems ***are*** being developed in the Warsaw Pact (particularly in Bulgaria), but these aren't yet in widespread use. And, while the Soviets are moving toward a more flexible fire control system, there are still one or two "critical nodes" in the targeting sequence that give the Soviet system a rigidity that would be unacceptable in our Army.

Captain Donald R. Sims, MI
Fire Support and Combined Arms
Operations Department
Field Artillery School

Another Response to "Soviet Artillery: Myth versus Reality"

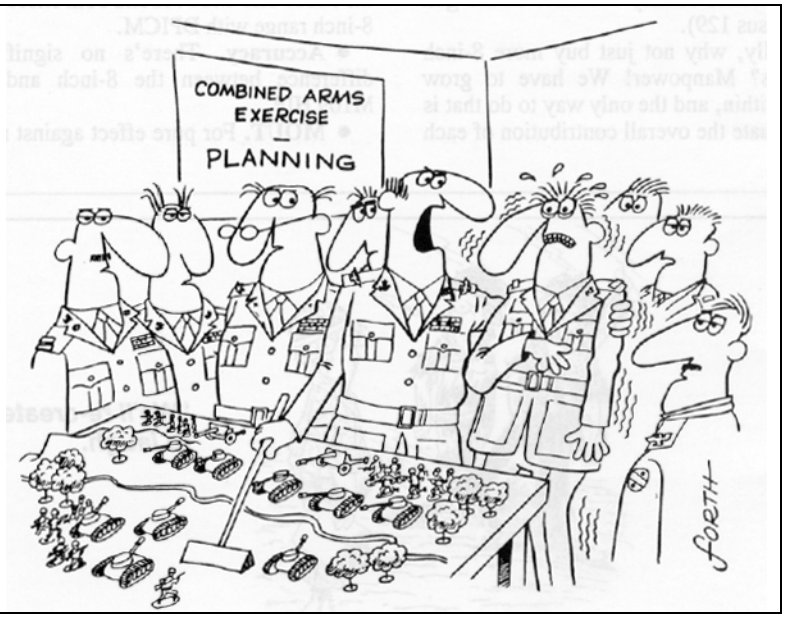
Captain Holthus' article "Soviet Artillery: Myth versus Reality" is right on target! To say these myths are indeed myths is an understatement.

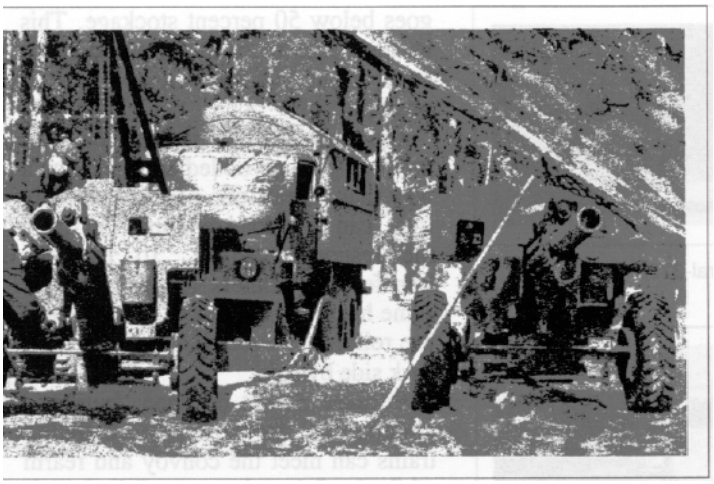
US fire support is expected to perform roles of close support, counterfire and attack at depth within the context of the AirLand Battle. To perform these missions and be able to decisively counter the Soviets' formidable resources to wage war now and in the future, the US and NATO must find ways to erode the Soviets' confidence in their ability to implement conventional or nuclear war. Believing misconceptions or "myths" about our potential adversary isn't the way to do it. With a realistic perspective of the Threat, the technology required to modernize and to accomplish this erosion is currently available. This effort requires the resources and mechanisms to place these technologies into systems and inventories rapidly.

Soviet advances in both the quantity and quality of its conventional forces is a reality. Also, the INF [Intermediate-Range Nuclear Forces] Treaty has complicated our assumptions of how the Soviets perceive deterrence. We professional Redlegs must ***know*** our potential enemy to meet the challenge!

Captain Gary L. Manning, FA
Senior Threat Analyst
Directorate of Combat Developments
Field Artillery School

"Pull yourself together, Featherstone. This is only an exercise."





Technical Support for Warsaw Pact Artillery

by Captain Michael D. Holthus, USAR

The Warsaw Pact, led by the Soviet Union, unquestionably has the largest modern field artillery force in the world. Recent Soviet disclosures designed to support conventional arms reductions talks have indicated the USSR has a total of 71,560 Field Artillery weapons ***in Europe alone.*** This figure is in conflict with that reported by the 1988 edition of *Soviet Military Power*: The magazine claims the entire Warsaw Pact has only 59,250 artillery weapons worldwide—a difference of 12,310 weapons. It's clear we've underestimated the size of the Warsaw Pact artillery force, at least in unclassified discussions.

This massive artillery force can bring truly devastating firepower to a future battlefield. But can the "Bear" get enough to eat?

Sustainment of Warsaw Pact artillery has often been a "safety strap" that US analysts have fallen back on. We're faced with overwhelming evidence of the efficacy of their weapons, munitions lethality and their reconnaissance, communication and command structures. The argument of last resort is often, "Well they surely can't maintain or supply ammunition to something that big. Look at the problems *we* have." Just a brief look at the Pact combat service support (CSS) doctrine and execution can, however, lead to a much different conclusion.

The main elements of what we call CSS—resupply of petroleum, oil and lubricants (POL), ammunition support, and maintenance—go by a different name in the Soviet Bloc: *technical support.* Technical support is defined as "...a complex of measures for the purposes of—

- Promptly supplying armament and equipment to the troops.
- Providing ammunition and military technical equipment.
- Maintaining armament and equipment in constant readiness for combat use.
- Ensuring high effectiveness and trouble-free operation of this equipment in all situations.
- Swiftly restoring damaged armament and equipment and returning them to action."

The Soviets put medical support, feeding their soldiers and supplying other materiel under the heading of *rear support,* a category that implies lesser urgency than does technical support.

For the purposes of this article, I'll address the problems of ammunition and POL supply, as well as maintenance and equipment repair. I'll emphasize two areas: the force structure that supports the Warsaw Pact field artillery battalion and the technical activities that affect it.

Support-Structure Modernization

Soviet force-structure changes increased the number of artillery weapons in the division by 1.5 times and, at the army and *front* levels, by as much as two to three times. These and other force-structure changes led to the formation of *materiel support units* at each level. In addition, the changes increased the motor transport and POL haul capacities by 30 percent or more at the division level during the past decade. This is notable evidence that logistics is as much a concern to the Soviets as the weapons themselves.

Motor Transport

Another aspect of the force modernization is the Soviet's replacing the 4.5-ton capacity 6x5 Ural-375D or ZIL-131 with the more modern 6x6 Ural-4320 (5-ton) or the 6x6 KrAZ-255B/260 (9-ton). These vehicles are both high-mobility vehicles and have excellent off-road movement characteristics. The KaMAZ-5320, a general-purpose truck, also is replacing the Ural-375D in many transport units, especially in motor transport units that won't travel off-road frequently.

It's worthy of note that the standard supply vehicle in the Soviet Army is a 4.5- to 5-ton truck. Trucks in the same

class as the US M35A2 (2 1/2-ton) are largely reserved for towing mortars, supporting airborne forces or other special duties.

Trailers deserve a special mention. The Pact uses trailers for mobile ammunition storage that can be left at rendezvous points while trucks go on to another resupply point. Trailers roughly double the load-carrying capacity of the trucks (3.5-ton trailers for 5-ton trucks and 8-ton trailers for 8-ton trucks).

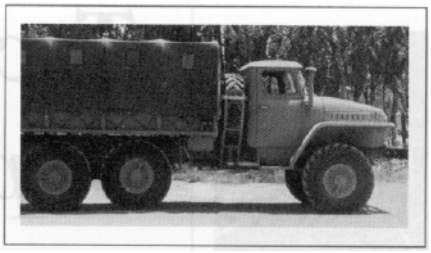
We can see an example of the overall increase in lift capacity by analyzing the upgrade of a motor transport battalion to a materiel support battalion. In this case, the Soviets have increased the unit's cargo-carrying capacity by 128 percent. This improvement is due to the numbers of vehicles concurrent with the replacement of Ural-375D with the KaMAZ-5320. These changes increase the lift capacity of the unit from approximately 1,280 metric tons to nearly 2,920 tons, excluding fuel tankers. If one considers the increase in artillery mentioned earlier, then the formation of the materiel support units more than makes up for the increased demand in ammunition transport requirements.

Ammunition Support

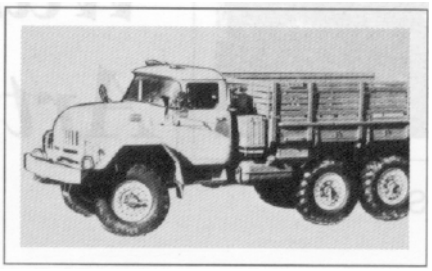
Ammunition, and in this case artillery ammunition, has the first priority for transportation resources. Soviet units receive ammunition based on a certain number of day's combat requirements. These large-scale calculations deal with *units of fire,* a term frequently (and incorrectly) compared to a US unit's basic load. A unit of fire is a fixed number of rounds for a weapon, which has a specific weight and cube associated with it. It's primarily a logistical tool that allows a planner to rapidly calculate the number of trucks and trailers required to accomplish a particular mission.

Soviet artillery units can keep approximately two units of fire in the battalion. If a Soviet division devotes 30 percent of its general ammunition transport and 90 percent of the artillery regiment's resources to artillery ammunition, then the unit should be able to lift another 1.6 to 2.3 units of fire. Thus with organic transport, the division can up-load four units of fire for its artillery units, about two to three days' supply.

A Soviet artillery battalion usually receives ammunition resupply before it goes below 50 percent stockage. This usually takes place at night and under cover from overhead observation, if possible.



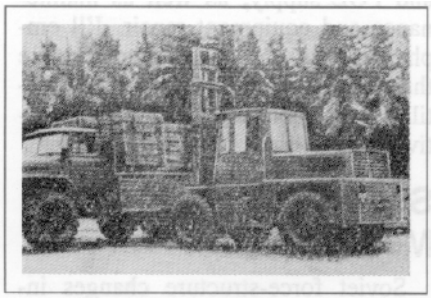
4.5-Ton Capacity Ural-375D



ZIL-131 Cargo Truck

5-Ton Capacity Ural-4320

Truck-Mounted Crane



Rough-Terrain Forklift
Loading Ammunition

Units meet with a resupply convoy, preferably in a wooded area, in such a way that at least one battery, possibly two, can transload ammunition from the resupply vehicle. To facilitate transfer, the trailers are roughly the same height as the trucks. The Soviets use roller conveyors if the trucks can't park side by side.

Because Soviet doctrine "pushes" ammunition forward, the battalion trains can meet the convoy and rearm while the firing elements of the battalion are engaged close by. In fact, Soviet artillery battalion trains are largely mobile ammunition repositories. They spend much less time on the road than their US counterparts since they don't have to go back to an ammunition transfer point to rearm.

Pact ammunition supply points are established in supply bases at each level down to regiment. These bases are highly mobile at regiment and division but involve significant down loading of supplies at higher echelons.

At *front* and army levels, the Soviets can establish forward or advance supply bases at intermediate points between the main base and the support facilities of the next echelon. While supplies usually are delivered to intermediate echelons, units can transfer or trade trucks and trailers with a lower-echelon supply unit or even have them deliver directly to a combat unit, thus avoiding transloading. While some Western analysts ridicule this concept, the Soviets have implemented it successfully in the past.

The Soviets and their allies have made remarkable strides in materiel handling equipment (MHE). Many specialized vehicles have cranes similar to those mounted on our 8x8 M985 heavy expanded-mobility tactical trucks (HEMTTs). Other improvements include introducing electric winches in ammunition facilities and using forklifts and cranes to lift palletized ammunition in supply bases. These measures began to receive wide coverage in military journals during the late 1970s and, undoubtedly, are in widespread use today.

We have long faulted the Warsaw Pact for not having an armored ammunition carrier. Their trucks are excellent general-purpose vehicles used for a

variety of cargo-hauling roles. But an armored transport vehicle is better suited for artillery operations, especially when units must move off road frequently to avoid counterfire.

The Soviets have designed specially equipped transport vehicles with cranes for the BM-22 (a 16-tube 220-mm multiple rocket launcher), the FROG-7 (a free-rocket over ground weapon) and many air defense systems. In addition, recent writings indicate the Soviets are using general-purpose armored vehicles as prime movers for certain artillery systems.

The next logical step may be the armored vehicle in the photograph on this page (MT-SB Ammunition Carrier Variant). Taken from a recent article, it appears to be based on the chassis of the 2S3 152-mm howitzer and is similar to our M113 armored personnel carrier (APC). It would seem strange, however, for the Pact to take a "step to the rear" in the infantry support-vehicles arena. A cursory glance indicates the three road wheels in the rear are closely grouped together, possibly indicating a load-carrying function. Such a vehicle would make an excellent armored ammunition carrier for 152-mm artillery systems.

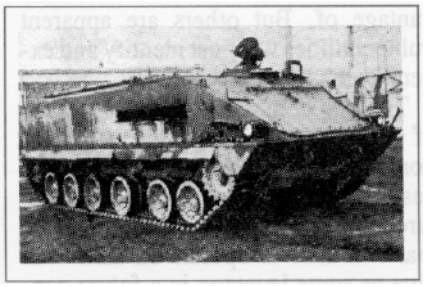
Another, and more disturbing, development is the advent of precision-guided munitions (PGMs) and their effect on ammunition expenditure. For some time, the Soviets have had laser-guided projectiles for their howitzers, an acknowledged case of technology transfer. These and other PGMs can reduce ammunition expenditures up to 100 times or more and will have a major effect on logistics.

Taktika, edited by Lieutenant General B. G. Reznichenko, et al, is a manual for Soviet officers updating tactics. It indicates that rocket or missile complexes carrying terminally homing sub-munitions will be able to kill 10 tanks with a single salvo. While PGMs are not suitable for all targets, engaging a few targets with such munitions, especially at longer ranges (e.g., in excess of 15 kilometers), will reduce significantly the ammunition tonnage the Soviets must move.

POL Support

Warsaw Pact forces are well-equipped with fuel-carrying vehicles, which include tankers and trailers. Similar to ammunition resupply doctrine,

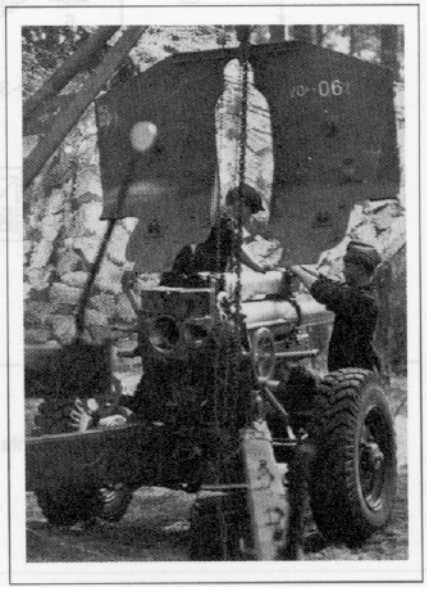
PM-2 Mobile Artillery Repair Complex



MT-SB Ammunition Carrier Variant

the Soviets plan fuel resupply based on a larger unit of measurement. This measurement, called a *refill,* is the total requirement for all the vehicles in a particular unit, excluding its organic tankers. The refill for a 152-mm self-propelled artillery battalion, for example, is approximately 14,000 liters, including gasoline and diesel.

Two to three tankers support Soviet artillery units, based on the ZIL-130 chassis that has a capacity of 4,200 liters. Each pulls a PTs-5.6-817 tanker trailer that holds an additional 5,600 liters. The fuel-storage capacity for the unit, given logistical upgrades similar to those for other support elements,



Soviets During Maintenance Day

is 29,400 liters—roughly a two-day supply.

Pact support units at higher levels have additional tanker support. Each regiment can carry 168,000 to 216,000 liters in tankers, and a division POL transport company has 80 to 96 tankers, each with a 5,200-liter capacity and a PTs-5.6-817 trailer. In aggregate, excluding battalion-level POL transport, a division can haul 1.8 to 2.5 *million* liters of fuel. Cargo trucks carry other POL products such as fuel additives, grease and oil in drums or cans.

Whenever possible, higher-level (army and above) Warsaw Pact commanders set up refueling stations where they can refill the maximum number of vehicles and maintain security. Such an arrangement is called a "mass fuel issue sector." The sector can refuel 24 vehicles simultaneously and pump 360 tons (roughly 450,000 liters) of fuel per hour. The station is controlled by an area chief, who sends commands to the traffic-control point chief, the fuel-issue control chief and the pump station, using electric signal lights and (or) a telephone.

Maintenance

Maintenance is critical to successful combat operations under any conditions. The Soviets have a program of both preventive maintenance and repair to keep equipment operational with a minimum of time and effort. In artillery units, Soviet maintenance is directed by the senior artillery engineer and battalion technical officers, supported by enlisted soldiers who perform the physical labor and battery officers who supervise their work.

The Soviet equivalent of motor stables is referred to as maintenance or servicing day. The entire day is reserved for crew maintenance of the ordnance, prime mover (or chassis) and other artillery support equipment.

Maintenance day is preceded by an inspection, conducted jointly by the senior officer of the battery, equivalent to our executive officer), the battalion technical officer and the artillery engineer. The senior officer of the battery keeps a flaw-detection log, which is used to request spare parts, materiel and special tools or armorers.

The Soviets refer to spare parts by the acronym *ZIP,* and they're much more extensive than the parts and tool kits US gun crews keep on hand. It's

interesting to note that drivers of artillery weapons are called "driver-mechanics," indicating a greater role in system maintenance than has been described in the past.

A plan prepared by the battalion technical officer directs specific repairs or tasks. The driver-mechanic and other members of the crew perform these tasks, according to the weapon's documentation and under the supervision of the senior officer of the battery. Thus, in principle at least, Pact preventive maintenance is not radically different from our own.

At regiment and division levels, special maintenance organizations with more extensive tool sets and specialized support equipment make major repairs and overhauls. Since the late 1970s, the workshop at regimental level has been the PM-2, which repairs artillery and missile equipment in a field setting. The complex consists of two workshop vans (one for general repairs and one for armament-specific tasks), a ZIL-131 cargo truck for carrying spare parts and materials and two trailers that have a portable welder and generator.

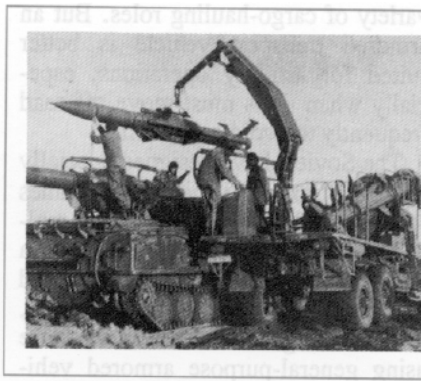
At the division level, the Soviets employ the DARM-4 mobile repair unit. It's composed of the two vans and trailers mentioned above and also a small-arms repair van, a radar-equipment repair van with electronic diagnostic equipment and an optical-instrument repair van. Both workshops have forges, drill presses, metal lathes and other tools used to repair mountings and large metal castings. Warsaw Pact allies have similar repair facilities, and the Soviets have even fielded an airborne artillery repair workshop.

One aspect of Warsaw Pact maintenance that's frequently derided is the "mothballing" of equipment in active units, except for a few exercises a year. While this practice saves wear and tear on equipment, it's cited often as a training flaw. One has to weigh this against the fact that the Soviets do, in fact, keep some equipment out for training and that they have some very sophisticated equipment training devices that realistically simulate laying, firing, loading, fault detection and on-the-spot repairs. The net result of this Soviet practice reduces repair time and the use of prescribed load list parts. They achieve these benefits with minimal loss of training effectiveness. In addition, when Pact equipment is called out for combat, it's newer and less abused.

Vulnerabilities

The Soviets and their allies haven't neglected the basic logistical requirements of supporting artillery operations. There are some potential problems, however, that an opponent can take advantage of. Some are inherent "weaknesses" that we can take advantage of. But others are apparent vulnerabilities we must identify and expend combat power to exploit.

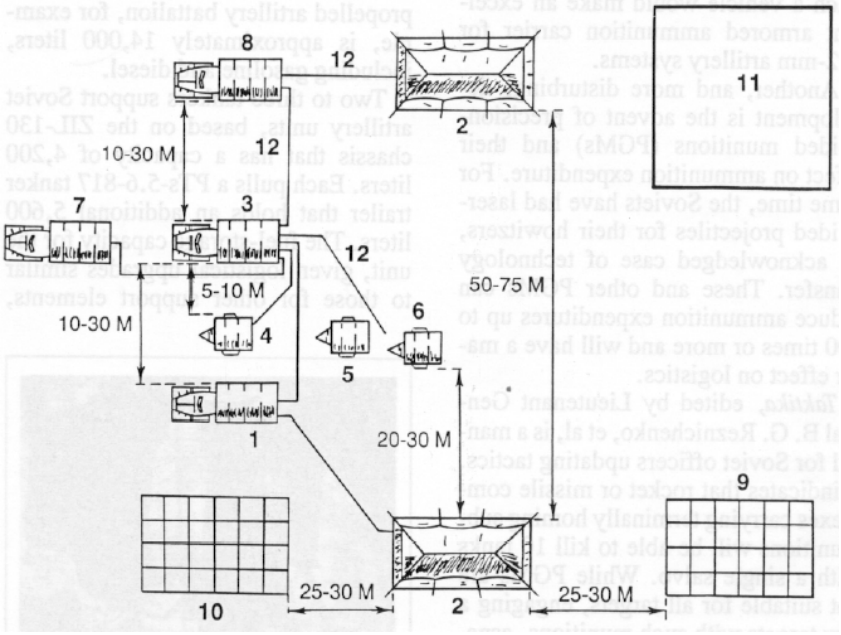
The first of these is the infrastructure of roads, bridges and railways to support a Warsaw Pact offensive. Europe has one of the world's best infrastructures, yet the sheer number of vehicles that will have to operate on them will give us some leverage in a future conflict. The intelligence preparation of the battlefield (IPB) process needs to identify the critical road and rail junctions that, if interdicted, will create confusion and backlogs in the Soviet support system.



4033 Crane with a ZIL-131 Truck and SA-6 Missile

The Soviets must stock the most important commodity, ammunition, in positions before starting an offensive. While PGMs may reduce this requirement somewhat, we can expect such practices to continue.

It's not a foregone conclusion that we'll unambiguously identify such stocks. But if we develop and deploy long-range visual reconnaissance systems, we'll surely be able to detect and target some of these positions. Large-scale



1. Mobile Repair Workshop
2. Tents (Heated)
3. Mobile Repair Workshop - Armaments
4. Generator
5. Welder
6. Forge
7. Optics-Repair Van
8. Small-Arms Repair Van
9. Vehicle Park
10. Park for Repaired Equipment
11. Service Area
12. Power Cables

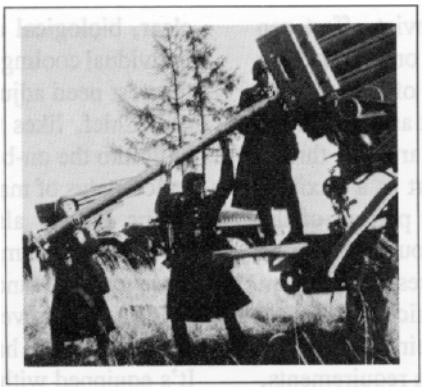
Schematic of a DARM-4 Ordnance Shop Deployed in the Field

logistical facilities (in any army) can't hope to escape detection for long and can be interdicted, given enough air power.

Lastly, at the risk of sounding ethnocentric, the Soviets and some of their allies are legendary for their lack of basic mechanical experience. Many Soviet soldiers can't drive until they're assigned to training units, a condition almost unheard of in the West. One would anticipate that this condition also would extend to electronics, now widely used in artillery and other arms. The language barriers and ethnic tensions created by the existence of more than 100 minorities in the Soviet Union compound training difficulties, not only in mechanics and electronics, but also in basic combat skills.

Conclusion

The Soviet Bloc apparently has built a credible and capable technical support base for its artillery forces, contrary to public beliefs. Considering the importance the Soviets place on artillery, this should not come as a shock.



Tecknika and Vooryzeniya, 1985

Soviets Reloading a BM-21 Multiple Rocket Launcher Mounted on a Truck

We would do well to reflect on examples of Soviet logistical capabilities from the past. In his book *Red God of War: Soviet Artillery and Rocket Forces,* Christopher W. Bellamy describes the Byelorussian Strategic Offensive of June 1944. In just five days, the Soviets massed more than 4,000,000 shells in one sector only 100 kilometers wide. This was during a time when most transport was by draft animal. On another occasion, they moved more than 38,500 vehicles and artillery weapons some 660 kilometers across the then crude infrastructure in eight days. These logistical feats, coupled with the modernization of their technical support capabilities, should remind us that the Warsaw Pact artillery's logistical support is as modern as that of any fighting force.

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Right by Piece

NOTES FROM UNITS

The Howitzer Battery of the Future

Battery A, 2d Battalion, 17th Field Artillery, at Fort Sill, Oklahoma, is the first M109A6 howitzer improvement program (HIP)-equipped unit. Its special mission is to give this improved 155-mm self-propelled howitzer its final, grueling operational test before it's type classified for production.

This is no routine checkout of a new piece of hardware. Lieutenant Colonel Richard H. Witherspoon, Battalion Commander, points out the decision to hold the operational test at Fort Sill was made nearly two years ago, with early designation of the Battalion and Battery for the job. The unit has been working closely with the Field Artillery School to develop new tactics and procedures, based on the advanced high-tech capabilities of the M109A6.

Battery C of the 2d Battalion, 17th Field Artillery, will be a conventional M109A2-equipped counterpart to A Battery throughout the test to provide a mission-by-mission comparison. The Battalion will fire a total of more than 40,000 rounds during 1989.

I was permitted to spend a few hours with A Battery during the crew-training phase of preparation. The purpose of this article is to get an initial reaction from the soldiers in the first unit to be organized and equipped with this sophisticated weapon system. What do *they* think of it?

Photos by Linda Young

The FAASV Mated with the M109A6 HIP

Background

Before they answer the question, let me give you some background. The M109A6 is part of the answer to the mind-boggling Soviet artillery threat. A US Army maneuver brigade

in West Germany facing a major Soviet effort can expect to be outnumbered at least seven to one in artillery weapons and face enormous "fire storms" of up to 2,000 tons of artillery munitions in periods as short as 45 minutes.

In addition to increased concern for the artillery threat, AirLand Battle doctrine looks to fire support as a flexible, maneuverable force constituting at least 50 percent of the force commander's combat power and accounting for the majority of the destruction of enemy forces. This is an interesting move toward Soviet doctrine, which has always regarded artillery as the arm of decision—their God of War.

To help meet counterfire and other mission requirements, HIP began in 1985 with a contract to BMY Combat Systems for *accelerated* development of a greatly improved system using available new technology. There will be only four years from contract award to type classification with fielding to begin in 1990. This is an extremely short period for a highly sophisticated weapon system.

HIP Capabilities

As the soldiers of A Battery describe the system, it drastically changes the way cannon artillery operates. For the first time and in a new turret, a self-propelled howitzer has onboard secure, digital and voice single-channel, ground and airborne radio system (SINCGARS) radios, a modular azimuth positioning system (MAPS) and an automatic fire control system (AFCS), which computes firing data and moves the cannon to the correct firing azimuth and elevation. The cannon is new and has a 30-kilometer range when firing M203 supercharge propellant with the rocket-assisted or base-bleed projectile.

Soldiers of A Battery move rounds onto the conveyer belt in the FAASV.

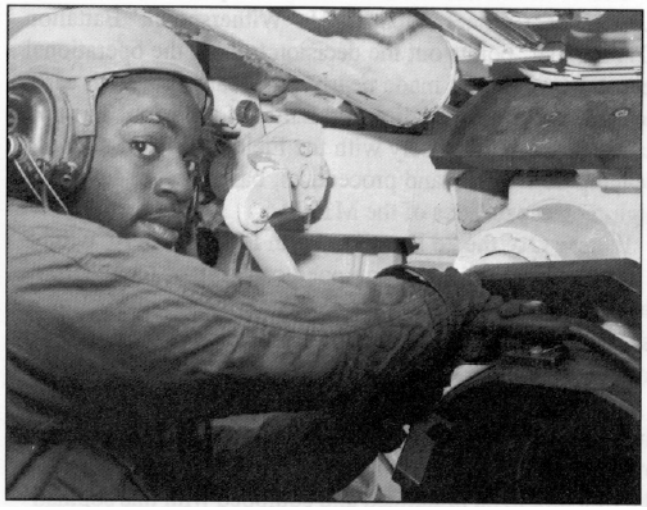
Staff Sergeant Phillip W. Hart, Section Chief, says the new HIP is a "good system." Specialist Phillip L. Covington, a HIP driver, believes it's a "vast improvement," especially with its capability to "go into position quickly." Sergeant Irving E. McDowney, Ammunition Team Chief, considers HIP a "good concept" and likes the "NBC [nuclear, biological and chemical] protective system with its individual cooling vests," although he points out the pipes in the vest need adjusting. Sergeant Samuel W. Huskey, Section Chief, likes the prognostics and diagnostics software built into the on-board computer for monitoring the maintenance status of major subsystems.

The Battery also has received the new M992 armored Field Artillery ammunition support vehicle (FAASV), a far more capable and, in fact, essential companion for the M109A6. This vehicle changes the way the unit manages, transports and handles ammunition in firing positions. It's equipped with its own SINCGARS radio and on-board auxiliary power unit.

HIP Changes and Concerns

While the M109A6 is the focal point of A Battery efforts, their *real concerns* are elsewhere. To use the new weapon system effectively, the Battery has undergone a series of changes. It's been expanded from a six- to an eight-gun battery with two four-gun platoons. This, in itself, brings large changes in the duties of officers and NCOs, as well as new tactics and procedures.

A soldier of A Battery operates the AFCS.



PFC Victor L. Robinson opens the breech to load a round in the HIP.

An example of change is the Battery fire direction center (FDC). Staff Sergeant Leonard D. Dobbins, Platoon Operations Center (POC) Section Chief, says: "I run one of the two platoon operation centers, not an FDC. I do tactical fire direction, move the guns and keep track of everything. But with four radios and more people, I need a bigger vehicle."

The firing platoon organization and the M992 are logical steps toward more decentralization, dispersion and mobility that come with the M109A6. As I write this article, A Battery hasn't reached the collective-training phase of preparation yet. So the gun crews are concerned about operations beyond the weapon itself. Specialist Harrison Edwards, a HIP Driver, wonders, "How will we have time to sleep?" Specialist Fredrick E. Hansen III points out, "We'll be shooting lots more—what about crew endurance?" They all believe noise, frequent moves and heavy firing will prevent meaningful sleep in the firing position.

There's also universal concern about ammunition resupply. Captain Thomas A. Moyer, A Battery Commander, states the HIP is always ready to fire. So the FAASV resupplies ammunition by making several trips each 24 hours to and from platoon or battery rearm points.

The FAASV is in the firing position a great deal of the time (130 rounds of ammunition between the HIP and FAASV). Staff Sergeant Eddie D. Permenter, Section Chief, says the FAASV should be mostly in the "mated" position with ammunition fed into the HIP on the FAASV's conveyor belt, conserving ammunition on the howitzer. He stresses the need for an intercom hookup between the two vehicles. Sergeant Kenneth R. Williams, Gunner, says the high firing rates (200 to 400 rounds per gun per day) make the X-Y stacker on the FAASV obsolete and the projectile sponsons (shelf-like projections on each side that cover the tracks) on the HIP too awkward to work around—"they need changing." There's widespread concern local security needs will cause the FAASV to be moved away from the HIP to an "overwatch" position. The gun crews don't believe this is a viable option.

Lieutenant Colonel Witherspoon summarizes HIP virtues as being self-laying and having radios instead of wire communications, user-friendly electronics (MAPS, AFCS and prognostics-diagnostics), a remote control travel lock, no need for camouflage nets, greatly improved responsiveness and a 200-percent increase in survivability. But all personnel agree that several *old* challenges—continuous operations, night operations, ammunition management and physical endurance—are intensified.

Soldiers of A Battery check ammunition moving on the conveyer belt from the FAASV to the HIP.

The 2d Battalion, 17th Field Artillery, a III Corps Artillery unit, is working closely with the Field Artillery School to develop HIP standing operating procedures to meld new organization, tactics and hardware into a smooth-running system. The Battery gun crews realize they'll have a unique say in how this system is fielded and used by other units, beginning in 1990. They're on a demanding training schedule involving double shifts seven days a week. Specialist Robert W. Lord, Jr., HIP Driver, says they're anxious to get real field experience, but "need more training time."

For now, the big test looms just ahead. A combat-ready cannon battery will take the new equipment and ideas to the field and put them through the toughest kind of real-world, 24-hour-a-day operations. Battery A will fire thousands of rounds in every conceivable situation. It'll make a dozen survivability moves each day and several longer tactical moves. As Sergeant McDowney says, "We'll make it or break it."

Brigadier General (Retired) Paul F. Pearson
Alexandria, VA

Logistics Release Point

In recent months, many Field Artillery units in Europe trained under the 3x8 concept for the first time. Conversion and the development of new tactics challenged the commanders training at Grafenwoehr Training Area, West Germany.

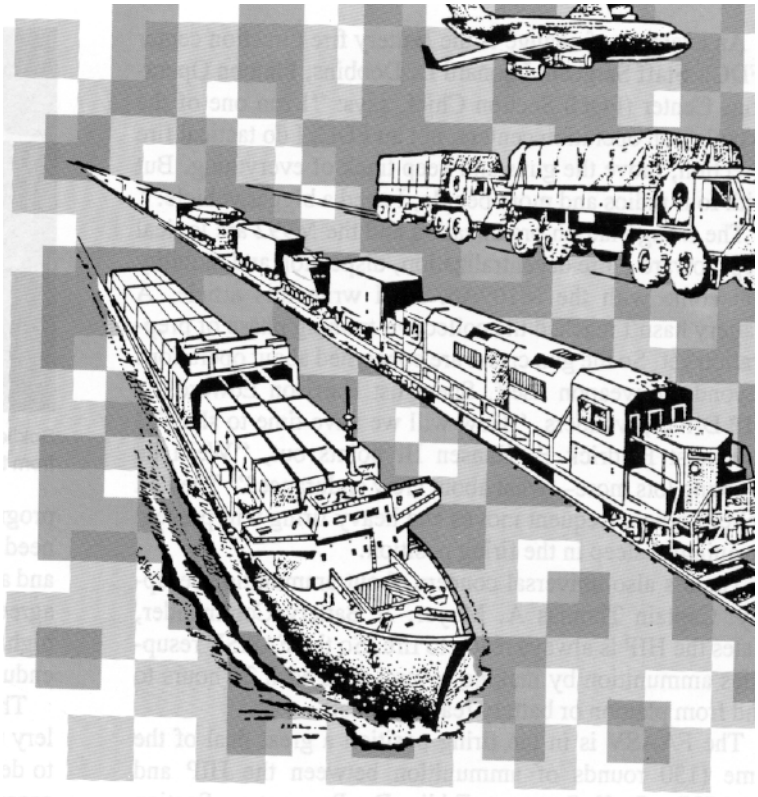
Fuel and ammunition resupply is a mission-essential task, and doctrine requires a 3x8 battalion deploy over a much larger area than ever before, making resupply operations more difficult tactically and more important to sustaining constant delivery of fires. Grafenwoehr recognized the resupply diffulties experienced by units and established a logistics release point (LRP) that allows a unit to conduct rapid resupply of all classes of supply.

Constant use of the facility and positive comments from the field resulted in the demand for more LRP areas, and terrain suitable for an additional facility was found on the reservation, giving the Field Artillery an LRP on both the east and west ranges. In addition, selected rendezvous and position areas can be used for rearming and refueling exercises, allowing commanders several options for completing this task.

Although Field Artillery units primarily use the LRPs, maneuver and support units also may use them to accomplish the same tasks.

Captain Clifton Brown, FA
Range Safety Officer
Grafenwoehr Training Area, West Germany

The Evolution of Ammunition Distribution



by Lieutenant General
William G. T. Tuttle, Jr., and
Captain Diane D. McIntyre, OD

Today, Army combat units face extended travel, long loading times and long queues when trying to replenish their ammunition. Ammunition transfer operations are time-consuming and labor-intensive. This article provides a "snapshot" of the transition from the current ammunition distribution system to the maneuver-oriented ammuintion distribution system (MOADS) designed to support future requirements as envisioned on the AirLand Battlefield.

Current Distribution

The extensive US commercial surface transportation industry moves Army ammunition from its origin at a production plant or depot to the air or sea port of embarkation. The US rail system transports the majority of the Army ammunition tonnages, supplemented by the commercial trucking industry. The ability of rail transportation to continuously move large tonnages makes it highly effective and efficient. The responsiveness and flexibility of truck transport makes it more suitable for moving small shipments to seaports and high-priority shipments to airports. The current capacity of the US commercial surface transportation system is adequate to meet known emergency or military mobilization needs.

There are 880 principal rail routes used to transport munitions, which handle 98 percent of the military munitions traffic. The routes are generally chosen to avoid, when possible, large urban areas and reduce general population exposure to explosive hazards.

The link between the Army shipper (ammunition depot or plant) and the commercial transportation industry is the Military Traffic Management Command (MTMC), Falls Church, Virginia, which is the Department of Defense's (DOD's) traffic manager in the continental United States (CONUS). In addition, MTMC serves as the common-user ocean terminal service operator in CONUS and certain overseas ports. Intertheater ammunition resupply by airlift is the exception and is the responsibility of the Air Force's Military Airlift Command (MAC).

We out-load ammunition for overseas shipment at three ammunition ports approved by the DOD Explosive Safety Board. After arriving in the overseas theater, we offload Army ammunition from ships at either military or commercial (host nation) ports and move it by military or civilian contract truck assets and (or) host nation rail system to its destination. We also use inland waterway transportation when advantageous.

Each host nation controls its commercial transportation, and during wartime, the US-host nation agreements determine the allocation of resources to US forces. US unified commanders are responsible for controlling, allocating and managing US military transportation assets and for coordinating host-nation civilian transportation assets.

We examine Army requirements and those of the other services from a transportation standpoint in the joint planning process. We use various analytical techniques to test transport capabilities, identify system shortfalls and recommend improvements. The three military transportation operating agencies (MTMC, MAC and Military Sealift Command, Washington, D.C.), in coordination with the Transportation Command (TRANSCOM), Scott Air Force Base, Illinois, and the overseas commanders maintain liaison and coordinate with the commercial carriers and governmental agencies involved in supporting the Army with transportation.

Theater

Materiel management centers (MMCs) manage the theater ammunition distribution system at the division, corps and theater levels. The division ammunition officer (DAO) prepares ammunition forecasts (48 hours in advance) and submits them to the corps MMC. The corps MMC directs shipments of ammunition from the corps storage areas (CSAs) and ammunition

supply points (ASPs) on corps transportation to the ammunition transfer points (ATPs). The theater MMC manages the distribution of ammunition shipments arriving from CONUS and replenishes issues from CSAs and ASPs out of theater storage area (TSA) stocks, as requested by the corps MMC. Ammunition shipments are made by the Armament Munitions and Chemical Command (AMCCOM), Rock Island, Illinois, from the US in response to theater Army requirements.

The organizations, procedures and techniques used to distribute ammunition in peacetime are similar to those used in wartime. Ammunition arrives at the port in containers or as breakbulk. A terminal service transportation company (usually contractors) then transloads these items to either theater truck transportation, rail or inland water modes.

The host nation provides theater rail transportation. In peacetime, we move most ammunition in Europe by rail. The mix of rail, truck or inland waterway distribution is determined by availability within each theater of operations. However, we maintain a minimum essential US military truck transportation capability for all theaters. Transportation medium truck companies (commercial) provide this US military truck transportation capability with M915 truck tractors and M872 stake and platform (S&P) trailers. The M872 is a 40-foot long, 34-ton capacity semi-trailer. These vehicles are a commercial fleet designed to operate only over improved roads.

The medium truck companies (commercial) deliver ammunition to the TSA, CSA and as far forward as the ASP, if road networks permit. General support (GS) ammunition companies operate both the TSAs and CSAs, the former usually holds 30 days of supplies and the latter, 7 to 10 days.

The number of transportation companies available depends on the expected theater ammunition consumption. In Europe, a mix of host-nation and US GS ammunition companies support the theater commander by meeting his storage requirement.

Corps

Figure 1 shows the flow of ammunition in a typical corps sector with four committed divisions. Road or rail networks entering the corps rear area represent the flow from the TSA or ports on corps main supply routes (MSRs). Each CSA usually will not store more than 25,000 short tons of ammunition. Usually three or four GS ammunition companies are required to operate the CSAs for the corps shown in Figure 1.

Stocks received at CSAs arrive directly from ports or from TSAs. We unstuff the containers; unload the items, along with breakbulk ammunition; and put them in warehouses in individual pallet configurations. When

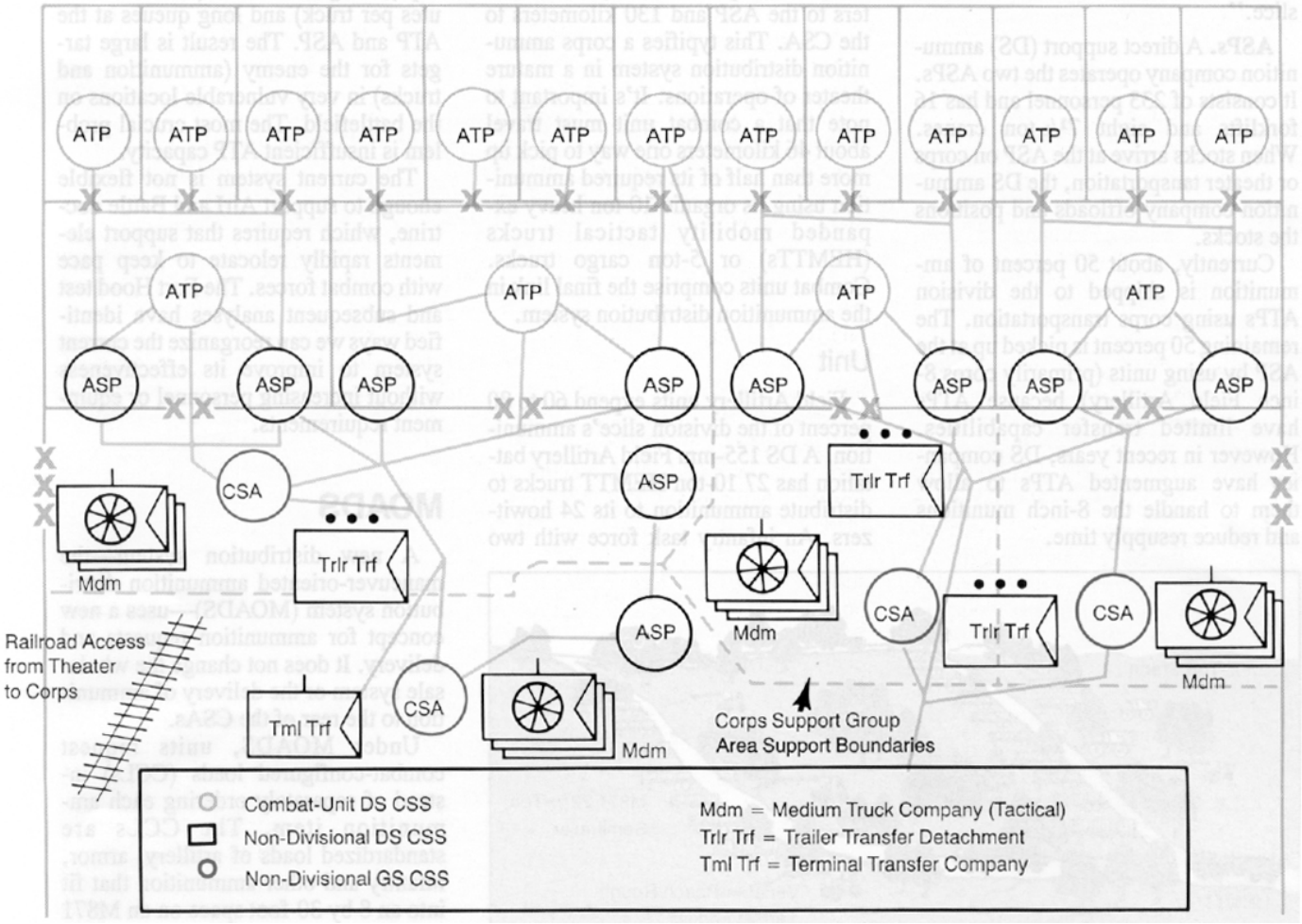
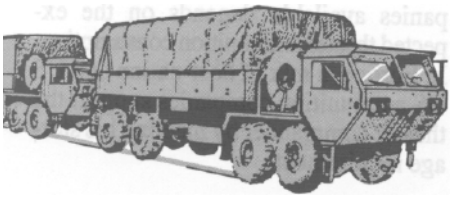


Figure 1: Under the Current Distribution System, the Flow of Ammunition in a Typical Corps Sector with Four Committed Divisions



we receive a requirement to ship ammunition forward, the ammunition company loads it on line-haul transportation provided by medium truck companies (tactical).

The corps transportation company has a tactical truck fleet composed of M931 5-ton tractors and M871 S&P trailers. These trailers are 30 feet long and have a 22½-ton capacity.

Division

Ammunition is shipped from the CSA to either ASPs or ATPs. There are typically two ASPs per division located in the division area. These two ASPs combined can store three to five days of ammunition for a division and the corps' forces supporting that division, hereafter referred to as a "division slice."

ASPs. A direct support (DS) ammunition company operates the two ASPs. It consists of 233 personnel and has 16 forklifts and eight 7½-ton cranes. When stocks arrive at the ASP on corps or theater tansportation, the DS ammunition company offloads and positions the stocks.

Currently, about 50 percent of ammunition is shipped to the division ATPs using corps transportation. The remaining 50 percent is picked up at the ASP by using units (primarily corps 8-inch Field Artillery) because ATPs have limited transfer capabilities. However in recent years, DS companies have augmented ATPs to allow them to handle the 8-inch munitions and reduce resupply time.

ATPs. The ATP is a collection of loaded, corps transportation 2½-ton S&P trailers with high-tonnage, high-usage single-item ammunition. An ATP will typically control 10 to 25 trailers of artillery, armor, infantry and other ammunition.

There is a total of four ATPs in support of a division slice, one in each brigade support area (BSA) and one in the division rear. The ATPs in the BSA can transload 350 to 500 short tons of ammunition per day. They're equipped with five forklifts and two cranes and staffed with 10 soldiers (see Figure 2). The rear ATP can transload 200 short tons per day and has three forklifts, three cranes and six soldiers. The entire collection of ATPs can support less than half of the division-slice requirements.

Transportation Distances. Distances between the various nodes in one scenario of the corps portion of a theater ammunition distribution system is two to three kilometers from the service battery to the ATP, 46 kilometers to the ASP and 130 kilometers to the CSA. This typifies a corps ammunition distribution system in a mature theater of operations. It's important to note that a combat unit must travel about 46 kilometers one way to pick up more than half of its required ammunition using its organic 10-ton heavy expanded mobility tactical trucks (HEMTTs) or 5-ton cargo trucks. Combat units comprise the final link in the ammunition distribution system.

Unit

Field Artillery units expend 60 to 80 percent of the division slice's ammunition. A DS 155-mm Field Artillery battalion has 27 10-ton HEMTT trucks to distribute ammunition to its 24 howitzers. An infantry task force with two companies of Abrams tanks and two companies of Bradley fighting vehicles will typically have 20 10-ton HEMTTs and 5-ton cargo trucks to distribute ammunition.

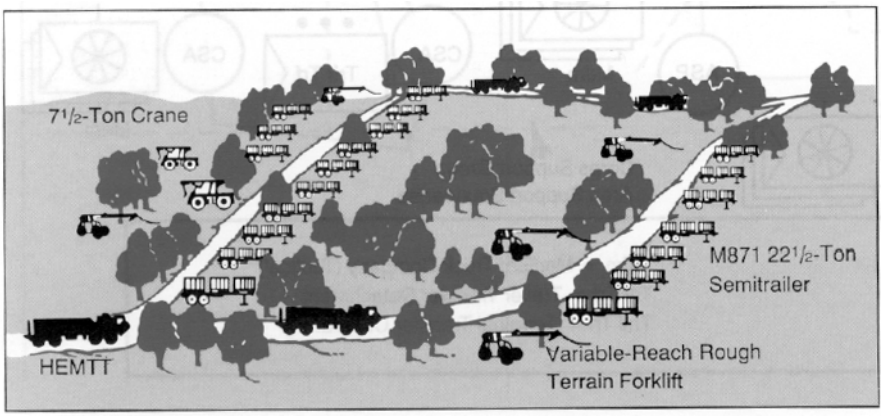


Figure 2: Notional ATP in the BSA under the Current Ammunition Distribution System

Current System Problems

A force development test and experimentation (FDTE) conducted at Fort Hood, Texas, during October and November 1986, confirmed that the current ammunition distribution system cannot meet the ammunition demands of intense combat. During the test, queues exceeding 40 user trucks were at the ATP. Combat units ran out of ammunition!

Ammunition distribution at all levels was found to be ponderous. Partially loaded M871 trailers accumulated at the ATP, and corps transporters had to make additional trips to retrieve them.

Today, combat units face extended travel (20- to 100-kilometer round trips), long load times (20 to 40 minutes per truck) and long queues at the ATP and ASP. The result is large targets for the enemy (ammunition and trucks) in very vulnerable locations on the battlefield. The most crucial problem is insufficient ATP capacity.

The current system is not flexible enough to support AirLand Battle doctrine, which requires that support elements rapidly relocate to keep pace with combat forces. The Fort Hood test and subsequent analyses have identified ways we can reorganize the current system to improve its effectiveness without increasing personnel or equipment requirements.

MOADS

A new distribution system—the maneuver-oriented ammunition distribution system (MOADS)—uses a new concept for ammunition requests and delivery. It does not change the wholesale system or the delivery of ammunition to the rear of the CSAs.

Under MOADS, units request combat-configured loads (CCLs) instead of separately ordering each ammunition item. The CCLs are standardized loads of artillery, armor, infantry and other ammunition that fit into an 8 by 30-foot space on an M871 trailer.

Corps

This change has two effects. First, it simplifies ammunition ordering and forecasting in combat (e.g., "three A packs, two E packs" versus "72 pallets, D563; 12 pallets, D541," etc.). Simpler ordering procedures reduce the likelihood of miscommunications and improve the probability the user will get the ammunition he needs. Units currently are using CCLs in III Corps, Fort Hood, and V Corps, West Germany.

Second, the CCL system smooths loading at the CSA and ASP. Using old procedures, ammunition handlers at these nodes could not load ammunition on trailers until the corps MMC directed an ammunition issue. Unless there is a permanent backlog at the CSA or ASP, there are periods of nonproductive time.

With MOADS, CSA and ASP ammunition handlers can use the time between ammunition issues to preconfigure CCLs and anticipate requirements because they know the approximate demands for each type of CCL. The GS ammunition company at the CSA remains the same as in the current system.

Division

With MOADS, we have three ASPs in support of the division slice instead of two. These ASPs are further forward and smaller than current ASPs. The MOADS allows the DS ammunition company the capability to provide an additional ATP to support corps combat units in the division. The amount of ammunition in the ASPs is reduced from three-to-five days to one-to-three days of supply for the division slice. This is still enough ammunition for short periods of time if communication lines are severed.

More ammunition is shipped directly from the CSA to the ATP, eliminating additional handling by the ASP. Those items routinely shipped from the ASPs to the ATPs (about 25 percent of the combat users' requirements) are shipped in CCLs. The combined effect of the reduced ASP stockage and flow of ammunition through the ASP is that the DS ammunition company remains relatively constant in size.

The ATPs provide 100 percent of combat unit ammunition requirements. (Combat units are Field Artillery, Armor, Infantry, Aviation, Air Defense Artillery and Combat Engineers.)

Unit

Under the current system, the user must pick up stocks from several different trailers at the ATP to make up complete, fireable rounds (e.g., fuze, projectile, propellant charge and primer) and to get the proper mix of components.

With MOADS, a user only needs to go to a single trailer to get the items he needs. The combat units pick up their entire ammunition requirements from the ATP, thereby eliminating the long distances traveled under the current system.

We'll replace the 7½-ton cranes currently at the ATP with 6,000-pound forklifts. During the Fort Hood test, we found them more productive and versatile than cranes at the ATP. Forklifts can transload all ammunition while cranes only can transload top-load pallets (e.g., Field Artillery projectiles) efficiently. Also, the crane's boom creates a dangerous signature at the ATP. Combat-unit ammunition distribution is the same as in the current system.

MOADS Improvements

The MOADS improves ammunition distribution significantly. It orients on the combat user by providing 100 percent of his ammunition at the ATP. The shortened unit resupply loop leaves more ammunition trucks available to resupply combat vehicles for the combat unit commanders.

MOADS enhances the survivability of the ammunition system by making ASPs smaller and more dispersed. It improves flexibility by making CSAs and ASPs more productive and by eliminating unnecessary loading and unloading of ammunition. For example, it reduces the CSA to ASP to ATP loop to CSA to ATP for 25 percent of the division slice's daily demands.

The MOADS puts more forklifts in the divisional ATP, thereby increasing the ATP's ability to meet ammunition requests and reducing queues and the ATP signature on the battlefield. Some commands already have implemented many MOADS elements.

Further Improvements

However, one crucial problem remains: efficiency of moving ammunition. To move ammunition stocks on the battlefield, they must be (1) picked up by a forklift one pallet at a time, (2) placed on a trailer, (3) taken to the new location, (4) picked up by a forklift one pallet at a time and (5) placed on the ground. There is no difference between the current system and MOADS in these most time-consuming and labor-intensive activities.

For example, if an ASP with one day's supply of ammunition (assume 2,250 pallets of ammunition) needs to move forward or rearward, it would take five forklifts and two cranes 53 hours of continuous loading at the ASP to move that ammunition. (This assumes five minutes per lift, no equipment breakdowns and unlimited availability of M871 trailers.)

We cannot support the highly mobile warfare envisioned in AirLand Battle doctrine without large increases in the number of ammunition handlers and equipment, if we have to continue to use current equipment. To alleviate these requirements, we need to use revolutionary materiel handling technology.

MOADS-PLS

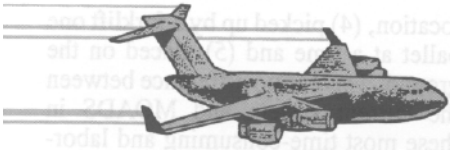
The palletized loading system (PLS) provides that technological breakthrough—a truck with a demountable cargo bed. It allows one soldier to load or unload from six to 24 pallets of ammunition at one time without a forklift.

The PLS system is a truck and trailer both with a demountable bed and each with a 16.5-ton capacity. The total system capability is two 8 by 20-foot decks with a 33-ton combined capacity.

Theater

The PLS ammunition distribution begins once ammunition has arrived at the TSA or CSA, as directed by the Theater Materiel Management Center (TMMC). Ammunition is stored on the ground at the TSA. When we ship ammunition from the TSA, PLS flatracks are loaded with a single type of ammunition. The flatracks are lifted onto theater transportation, using rough-terrain container cranes (65 tons) and shipped to the CSA where flatracks (six to 24 pallets) are stored.

The current Transportation medium truck company (commercial) is unchanged. A new GS ammunition company operates the TSA, whose primary missions are to unstuff containerized ammunition and ship prepositioned war reserves. The TSA increases in



size because additional incoming ammunition is diverted to the TSA to take advantage of its safer location (far from close combat) and heightened productivity. Approximately 50 percent of the theater's ammunition will flow through the TSA.

Corps

The CSA's primary mission is to build CCLs. Like MOADS, PLS uses CCLs to simplify the ammunition request system. The CSA receives 50 percent of the ammunition already on flatracks; the remainder comes primarily as breakbulk ammunition from the port on either rail or truck, as in the current system.

Ammunition is stored on flatracks in single-item loads or CCLs, as the workload dictates. All Field Artillery ammunition is stored in complete round configurations.

In the current system, each pallet of ammunition requires three or more lifts at the CSA. With PLS, pallets are, on the average, handled only once. All subsequent movement is on flatracks. The decrease in ammunition handling reduces the CSA's equipment and personnel.

Ammunition distribution and management remains as in MOADS. Ammunition shipments are from the CSA to ASP or ATP by the medium truck company (PLS).

Division

The ASP's mission is the same in PLS as with MOADS: operate three ASPs and one ATP. The ASPs ship approximately 25 percent of the division slice's ammunition needs.

The ASP builds CCLs and stores one half to one day of supply for its combat users. This ammunition is available for emergency pick up or delivery if main supply routes are interrupted. The PLS difference—no waiting for ammunition loading—is a major improvement in the ammunition system's responsiveness. The DS ammunition company and ATP are smaller in their PLS configuration.

Unit

Field Artillery ammunition is delivered directly to self-propelled units. The PLS convoy stops at the ATP, determines if the customer can accept the ammunition shipment and follows a unit guide to the service battery location.

Ammunition for all other users arrives at the ATP on PLS flatracks and stays there for customer pickup. Infantry, armor and other users have their trucks loaded by forklifts at the ATP. We can stack PLS flatracks, thereby reducing the number of trips truck units must make to return empty flatracks to CSA.

The PLS cost and operational effectiveness analysis eliminated all forklifts from ATPs. A subsequent analysis indicates we should retain three forklifts per ATP.

The self-propelled 155-mm and 8-inch Field Artillery units are scheduled to receive PLS trucks by corps sets, starting in 1992. When a PLS convoy arrives, corps trucks will unload full PLS flatracks and pick up empty PLS flatracks. The artillery units will pick up full PLS flatracks, leaving no ammunition on the ground.

The Field Artillery School is evaluating the use of PLS trailers. While the trailers diminish the PLS trucks' mobility in rough terrain, they could add at little cost another 190 rounds per truck in the service battery area.

Infantry, armor and other users will continue to distribute ammunition using HEMTTs and 5-ton trucks. However, these branches are evaluating using PLS for resupply.

MOADS-PLS Improvements

The Fort Hood test found the PLS distribution system to be far more effective than the current ammunition system. It moved 42 percent more ammunition using 36 percent fewer vehicles.

The PLS improves distribution by delivering ammunition directly to artillery users, virtually eliminating load time for ammunition supply trucks. It improves support to other users by reducing queue time and enhances system survivability by making ATPs smaller.

The PLS creates flexibility and responsiveness in a system known to be rigid and untimely. For example, if an ASP with one day's supply of ammunition (assume 2,250 pallets) needs to be moved forward or rearward, it requires no forklifts to prepare the ASP to move. As soon as corps PLS trucks arrive, the ASP can begin to move. There is no waiting time for loading.

Our British, German, Canadian and French allies are buying PLS-compatible systems. The US signed an interoperability agreement with the United Kingdom and Germany in January 1988, assuring that each nation's PLS trucks can pick up, transport and discharge any other signatory's flatracks.

The PLS lightens the logistical tail by eliminating 3,600 personnel and 3,900 equipment requirements. Studies are under way to determine the cost and effectiveness of using PLS to provide barrier materials, fuel, repair parts, shelter and bridge transportation.

Conclusion

PLS can revolutionize the Army's distribution system. Employing PLS to support previously unsupportable combat operations is what we need on the AirLand Battlefield.

This evolution of ammunition distribution—MOADS and PLS—gives us the competitive edge to win the first battle and make it the last—firepower is the key to that victory!

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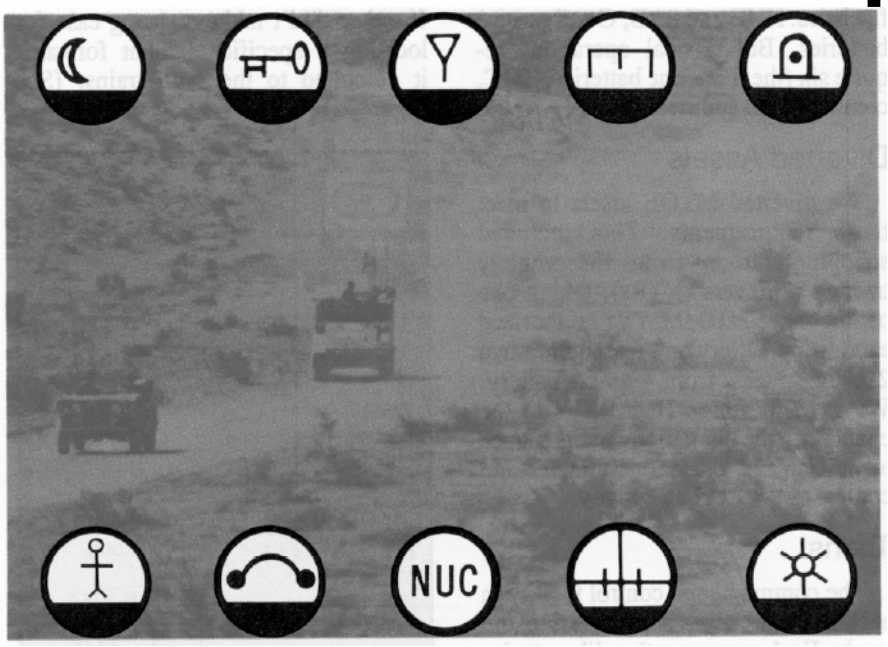
Captain Diane D. McIntyre, Ordnance, is a staff officer at the Logistics Center. She has served as the Ammunition Production Officer for Crane Army Ammunition Activity, Crane, Indiana, and Battalion S1 and Commander of the Headquarters and Headquarters Company, 6th Ordnance Battalion, South Korea. Captain McIntyre is a graduate of the Combined-Arms and Services Staff School, Fort Leavenworth, Kansas, and is pursuing a dual Master's of Science In Business Administration and Logistics Management from the Florida Institute of Technology.

Combat Service Support of a Direct Support Field Artillery Battalion



by Colonel Vollney B. Corn, Jr., and Major Lawrence R. Adair

The organization and supervision of combat service support (CSS) assets of the direct support (DS) Field Artillery battalion clearly fall within the purview of the battalion executive officer. Unfortunately, the Field Artillery community has lagged far behind our maneuver counterparts in documenting doctrinal procedures or even proven techniques for CSS.

What follows is the 1st Battalion, 3d Field Artillery's approach to organizing CSS functions. Without question, the focus of this approach was to participate in National Training Center (NTC) rotations at Fort Irwin, California. For example, we didn't consider storing and securing nuclear weapons. In defense of our approach, we found it had an important advantage—**it worked!**

As a part of the 2d Armored Division, Fort Hood, Texas, we also enjoyed a complete set of modernized equipment—the Field Artillery ammunition support vehicle (FAASV), high-mobility multipurpose wheeled vehicle (HMMWV), heavy expanded-mobility tactical truck (HEMTT), etc. Also, the officers and NCOs were fully committed to *executing* this system.

This CSS plan is not a panacea. But perhaps it will provide a basis for professional discussion of CSS in the Field Artillery.

Responsibilities

The battalion executive officer (XO) is the officer in charge (OIC) of CSS. Presumably, the battalion commander will be forward with his brigade commander during the battle, leaving the XO, S3 and command sergeant major (CSM) to run the battalion.

Executive Officer

During the battle, the DS S3 functions as the OIC of the tactical operations center (TOC). This allows the XO to move freely to critical points to best use his expertise—at a firing platoon headquarters, the combat trains or to run down lost or damaged equipment. During the fight, the XO rarely will be in the field trains because of the extreme distances from the gun lines to the brigade support area (BSA). Therefore, we avoid assigning him responsibility for a specific element of CSS. At the same time, there should be no function the unit can't execute in the absence of the XO.

S1

The battalion S1 is in the combat trains and performs three important functions. First, he's responsible for personnel and administration requirements—most importantly, replacement flow and casualty reporting. Second, he's the senior staff officer in the administration and logistics operations center (ALOC).

The ALOC is the command and control center of the combat trains. It tracks the logistical status of the battalion for personnel, equipment and all classes of supply.

Finally, the S1 provides logistical and other input for Paragraph Four of the Field Artillery support plan. After receiving a fragmentary order, the S1 compiles a report of the CSS status of the battalion and moves to the TOC to support the battalion S3's development of the plan.

S2

The battalion S2 watches the positioning of CSS assets, such as the combat trains and the organizational maintenance collection point (OMCP), if required. He considers enemy indirect fire assets as well as avenues of approach into the brigade area of operations. The S2 provides threat overlays to these elements and monitors the positions proposed to support the scheme of maneuver. Also, based on counterfire communication links, the S2 monitors the logistical status of attached radars.

S4

The battalion S4 in the field trains is the logistical coordinator. He's the primary liaison with the brigade ALOC and the staff OIC for the field trains. He's responsible for accurately reporting the status of all classes of supply, sustaining appropriate stockage levels, tracking requisitions and coordinating food services operations.

BMO

The battalion maintenance officer (BMO) works out of the field trains and is the liaison with the DS maintenance unit of the forward support battalion. Most importantly, he supervises tracking priority 03 repair part requisitions. An O3 requisition passed to the BMO is first cross-checked with the four forward prescribed load lists (PLLs) for filling—headquarters and headquarters battery (HHB) and A, B and C batteries. Therefore, any O3 part the BMO must run down is not forward of the BSA.

S3

The battalion S3 considers logistics when he develops the tactical plan. This means he asks the executors of the CSS system if they can support the plan.

HHB Commander

The commander of HHB commands the combat trains while the commander of service battery commands the field trains. The service battery commander serves as the fire support officer (FSO) for the BSA. At the least, he selects targets along the avenues of approach into the BSA and sends these targets to the TOC and the brigade FSO.

Battery First Sergeants

Battery first sergeants are essential to the proper execution of this system. They supervise their batteries' *timely* participation in the battalion logistics package (LogPac) convoy resupply operations and ensure the accuracy of required daily reports. With split trains, there's *no* reason for a first sergeant to be to the rear of the combat trains unless he's a casualty!

Command and Control

The CSS system needs two TOCs with radios to support the administrative and logistics communications nets. The battalion modified tables of organization and equipment (MTOE) provides five command and control (C^2) facilities: HHB and A, B, C and service batteries. But tactical operations require six (the three line batteries, TOC, combat trains and field trains).

Diverted Assets

We diverted MTOE assets to meet these requirements. This included stripping radios from the vehicle tracked retrievers (VTRs), taking one of the seven HMMWVs authorized each firing battery and reassigning two 2½-ton trucks from service battery. We gave the three HMMWVs to the chaplain, the battalion maintenance technician and to use for command and control of the LogPac convoy.

Trains

The command and control facility in each trains area was a built-up 2½-ton truck. Each was exactly alike, to include the location of the radio and switchboard, tactical situation map with overlay and logistical status charts. The map and charts were covered with plexiglass on which the data was posted. We kept back-up data as well as previous status charts in a three-ring binder.

In addition to tracking personnel, equipment and classes of supply, both trains had to know precisely the number of personnel and vehicles in their areas at any time. They also recorded the bumper numbers of every vehicle and every item carried on the vehicles.

The field trains acted as the net control station for the administrative and logistics net. (See Figure 1.) In addition to internal wire laid to each agency housed in both trains, the field trains ran a direct line to the brigade ALOC as its primary means of communications.

We based the designation of personnel and equipment for the field trains on an analysis of their suitability and survivability in a forward location. If we couldn't make a strong case for locating a specific element forward, it defaulted to the field trains. (See Figure 2.)

Personnel	Equipment
BC/1SG, Svc Btry S4/PAC Supv BMO/BMS PAC (–) Bn S4 (–) Bn Maint (–) Maint Spt Team (–) Bn Mess Svc Btry Maint Team Svc Btry Supply Bn Ammo Pit (–) Medic POL (–)	TOC (2.5-Ton Truck) Bn Maint C^2(–) • HMMWV/CUCV* • 2.5-Ton Truck (PLL/TAMMS)** • 5-Ton Wrecker Maint Spt Team C^2(–) • HMMWV • 5-Ton Long-Bed • 2.5-Ton Truck Svc Btry Maint (2.5-Ton Truck with Trailer) Bn S4 C^2 (HMMWV) Bn Ammo Plt • C^2 (HMMWV) • HEMTTS POL • Diesel Fuel Tankers • 5-Ton Tank and Pump Unit Svc BC/1SG C^2 (HMMWVs) Svc Btry Supply (2.5-Ton Truck with Trailer) Bn Mess • MKTs • 2.5-Ton Truck PAC (CUCV)*

* Civilian Utility Cargo Vehicle
** The Army Maintenance Management System

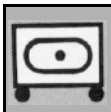
Figure 2: Field Trains Personnel and Equipment

Trains	C^2 Net	Radios
Field	A/L(NCS)*	VRC-47 (Secure)
	Bde A/L	Aux
	CF1**	VRC-46 (Secure)
Combat	A/L	VRC-46 (Secure)
	CF1**	VRC-46 (Secure)

*A/L(NCS) = Administrative Logistical (Net Control Station)
**CF1 = Command Fire 1

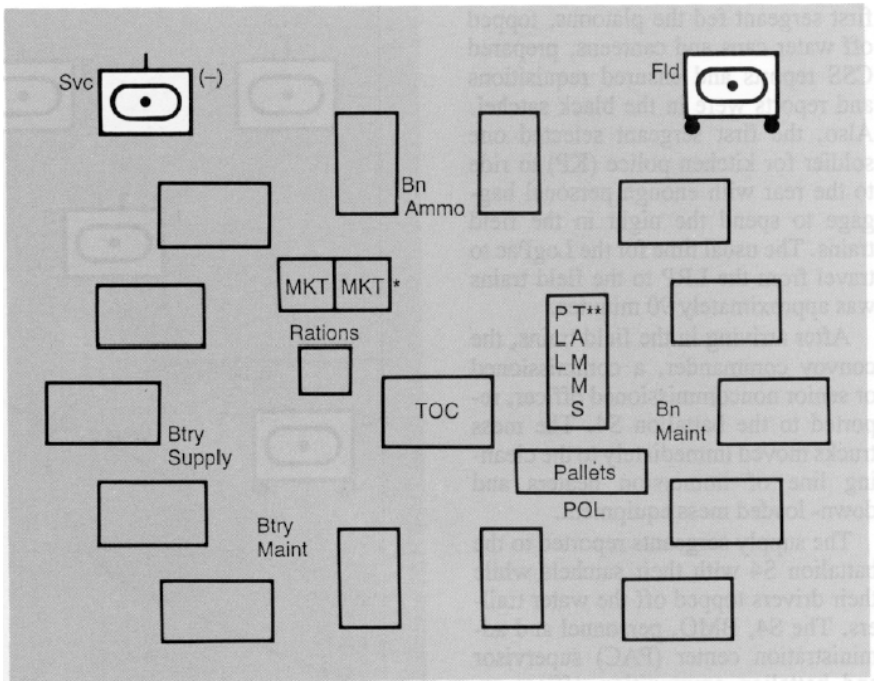
Figure 1: Trains Communications Nets and Equipment

The organization of the field trains required that we establish vehicles and facilities in precisely the same configuration every time. (See Figure 3.) The entrance was always at the "six-o'clock position." The pallets were dunnage, labeled one for each battery. This was the distribution point for supplies picked up by supply sergeants in the field trains. Similar to the field trains, we established the combat trains (see Figure 4) in the same configuration every time (see Figure 5).



Personnel	Equipment
BC/1SG, HHB S1, S4 NCOIC Bn Maint Tech/Sr Maint NCO Bn maint (-) Maint Spt Team (-) Physician's Ast/Bn Aid Station (BAS) Bn Survey Bn Commo (-) Bn Ammo Pit (-) POL (-)	ALOC (2.5-Ton Truck) S1 C^2 (HMMWV) BC/1SG C^2 (HMMWVs) Bn Maint/Maint Spt Tm (MST)(-) • C^2 (HMMWVs) • 2.5-Ton Truck (#2 Common Welder) • 2.5-Ton MST (Armament) BAS • PA C^2 (HMMWV) • M561 Ambulance (x2) • 2.5-Ton Truck POL (Diesel Fuel Tanker (HEMTT) with Trailer, (Class I/III Package) Ammo (HEMTT x3) PADS (HMMWV x2) Commo (HMMWV)

Figure 4: Combat Trains Personnel and Equipment



* MKT = Mobile Kitchen Trailer
** TAMMS = The Army Maintenance Management System

Figure 3: Field Trains Schematic

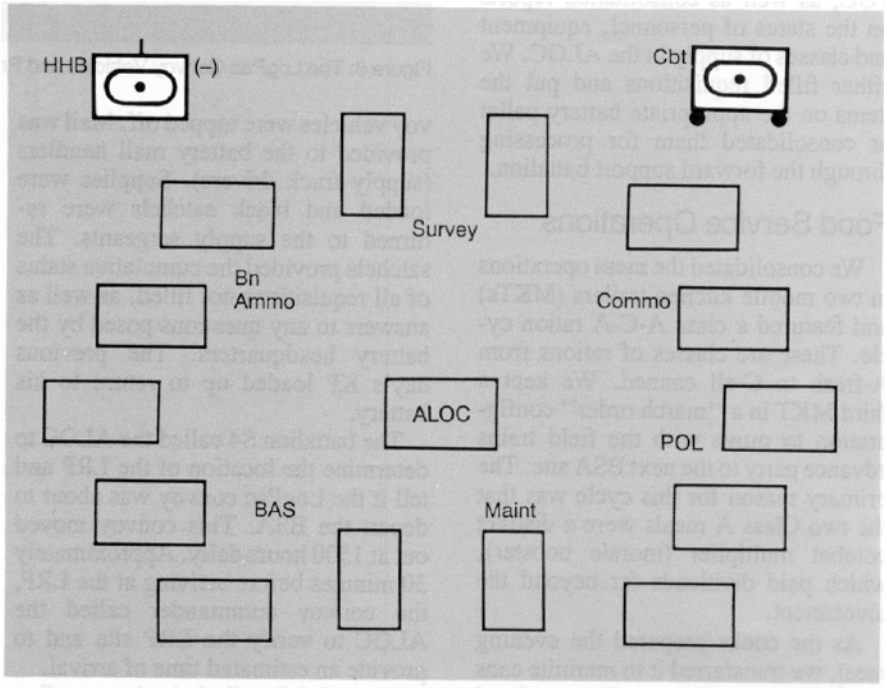


Figure 5: Combat Trains Schematic

Execution

We designed the CSS system around a daily LogPac convoy from the field trains to the batteries and "black satchels" to carry required reports to the rear. In addition to this, the chain of command selected two functions to emphasize—food service operations and casualty reporting and evacuation.

LogPac Operations

The LogPac convoy consisted of a command and control vehicle (HMMWV), four supply vehicles with water trailers and four built-up mess trucks. (See Figure 6.) A black satchel was distributed to each battery headquarters. The battery supply sergeants carried the reports, requisitions and related documents to the battalion S4 in the satchels.

The LogPac convoy would form at the designated logistics release point (LRP) each morning at 0800 hours. The combat trains designated the LRP location and reported this information to TOCs throughout the battalion. The LRP was usually near the combat trains but immediately adjacent to the main supply route.

The battery first sergeant ensured that both his resupply vehicles arrived at the LRP on time. Every morning, the

first sergeant fed the platoons, topped off water cans and canteens, prepared CSS reports and ensured requisitions and reports were in the black satchel. Also, the first sergeant selected one soldier for kitchen police (KP) to ride to the rear with enough personal baggage to spend the night in the field trains. The usual time for the LogPac to travel from the LRP to the field trains was approximately 90 minutes.

After arriving in the field trains, the convoy commander, a commissioned or senior noncommissioned officer, reported to the battalion S4. The mess trucks moved immediately to the cleaning line of immersion heaters and down-loaded mess equipment.

The supply sergeants reported to the battalion S4 with their satchels while their drivers topped off the water trailers. The S4, BMO, personnel and administration center (PAC) supervisor and battalion ammunition officer reviewed the documents in each satchel.

The HHB's satchel included reports on the status of the combat trains and TOC, as well as consolidated reports on the status of personnel, equipment and classes of supply in the ALOC. We either filled requisitions and put the items on the appropriate battery pallet or consolidated them for processing through the forward support battalion.

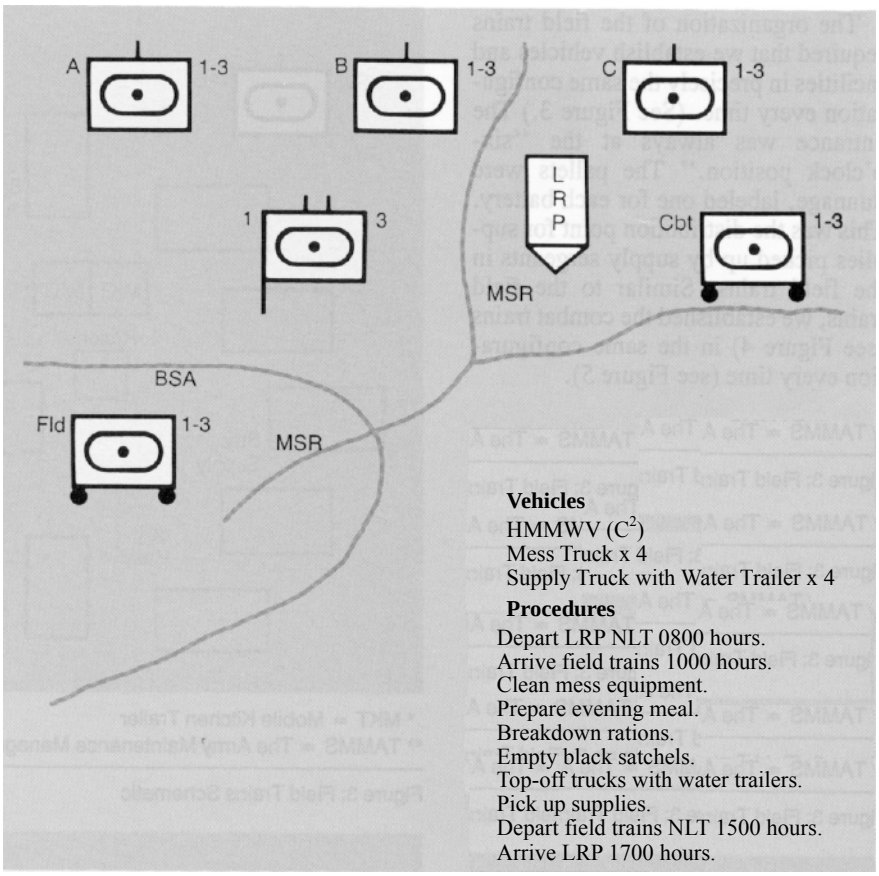


Figure 6: The LogPac Convoy Vehicles and Procedures

Food Service Operations

We consolidated the mess operations in two mobile kitchen trailers (MKTs) and featured a class A-C-A ration cycle. These are classes of rations from A-fresh to C-all canned. We kept a third MKT in a "march order" configuration to move with the field trains advance party to the next BSA site. The primary reason for this cycle was that the two Class A meals were a distinct combat multiplier (morale booster), which paid dividends far beyond the investment.

As the cooks prepared the evening meal, we transferred it to mermite cans for distribution. We usually completed ration breakdown at approximately 1100 hours. We loaded the breakfast A ration and the lunch meals ready to eat (MREs) on the mess trucks. The evening A meal was stored in the MKT for the cooks to prepare when the LogPac convoy returned the next day.

The mess operations and processing of requisitions continued throughout the day. Water trailers and LogPac convoy vehicles were topped off. Mail was provided to the battery mail handlers (supply truck drivers). Supplies were loaded and black satchels were returned to the supply sergeants. The satchels provided the cumulative status of all requisitions not filled, as well as answers to any questions posed by the battery headquarters. The previous day's KP loaded up to return to his battery.

The battalion S4 called the ALOC to determine the location of the LRP and tell it the LogPac convoy was about to depart the BSA. This convoy moved out at 1500 hours daily. Approximately 30 minutes before arriving at the LRP, the convoy commander called the ALOC to verify the LRP site and to provide an estimated time of arrival.

The ALOC called the battery first sergeants who were to be at the LRP when the convoy arrived to lead the vehicles to the new battery positions. Usually the first sergeants alternated the location of the mess truck in each platoon.

Classes of Supply

For each class of supply, we established routine and emergency requisitioning procedures. For the most part, we processed the routine requisitions via the black satchels carried to the rear during the daily LogPac convoy. As a backup, a call on the administrative/logistical (A/L) net (secure) allowed us to process routine requisitions when the supply sergeant was out of the battery area. We managed emergency requisitions by radio or courier, based on the class of supply and its availability in the combat or field trains.

Class I. This features an A-C-A ration cycle augmented with hot soup and coffee, as appropriate. Consolidated preparation of the evening meal, KPs from units and mess truck drivers from high-density MOSs ensured that we provided food service. Each battery maintained contingency stocks of MREs (one day of supply) in case the LogPac convoy was interdicted.

Class II. We manage this class by exception; some Class II items were requisitioned and filled. This wasn't a problem.

Class III. We met the Class III requirements, for the most part, in concert with anticipated moves of each

battery. Coordination with the battalion S3 helped this effort. Where possible, we used a "service station" approach to refuel each element on the march. At a minimum, the combat trains maintained a HEMTT tanker of diesel fuel 2 (DF2), which holds 2,500 gallons, as well as a pod of motor gas (MOGAS), which holds 600 gallons, and packaged products. When the tanker was low, we swapped another HEMTT tanker from the field trains for it during the next LogPac run.

Class IV. This class needed emphasis to ensure supplies were available and that we used them properly. The maneuver forces are allocated the bulk of the Class IV materiel. As a result, preparing defensive positions for each Field Artillery unit is, at best, substandard.

All aspects of Class IV management required attention: coordination, requisitions for distribution, transportation assets for delivery, transportation of reusable materiel by each platoon or trains, proper preparation of positions and correct use of Class IV materiel in the construction of positions.

Class V. Sustaining appropriate levels of 155-mm ammunition required a specific program of its own. We moved Class V by ammunition convoy under the command and control of the battalion ammunition officer but separate from the LogPac convoy. In this way, we reduced the signature and length that such a combined convoy would present. In addition, the irregular frequency of ammunition resupply requirements makes combining convoys inefficient.

The process included the S3's forecasts of 155-mm ammunition, based on the mission; "reload" of the unit basic load (UBL), based on the S4's daily status reports from the units; and S3's approval of the entire ammunition requirement (via FM radio). Once approved, the battalion ammunition officer prepared DA Form 581 Request for Issue and Turn-In of Ammunition and submitted it to the forward support battalion.

We maintained the bulk of the ammunition on HEMTT trucks in the field trains. When required, the battalion S3 authorized one of three distribution methods.

- The battalion coordinated and delivered ammunition to a site at least 1,500 meters behind the platoon location; the FAASVs transloaded the ammunition.
- The battalion coordinated and delivered ammunition to the LRP; the batteries led HEMTTs to selected sites; the FAASVs transloaded the ammunition.
- The batteries picked up ammunition at a logistics raid (LogRaid) site.

In addition to this ammunition, the combat trains kept three HEMTTs loaded with ammunition (200 complete rounds each). This was the S3's "hip-pocket" ammunition for emergency use. When the S3 ordered this ammunition to one or more elements, the combat trains called the field trains to restock this ammunition supply in the combat trains immediately.

Class VI. See the chaplain!

Class VII. Replacing major end items required considerable coordination. The key to success was the subordinate units' reporting the requirements accurately and in a timely manner. The S4 supervised the reporting procedures to the brigade ALOC and followed up to ensure complete weapon systems returned to combat.

This systems approach incorporated all elements, to include end items, fuel, ammunition, personnel and ancillary equipment. We submitted and tracked requisitions by weapon systems, consistently achieving the minimum turnaround time.

An important component of these procedures was replacing personnel. The unit initially used an alphabetical roster plus the last four digits of the social security number to identify casualties requiring replacement. Although this procedure served the unit's purpose, it had to change it to battle rosters to properly integrate the information in the brigade's casualty reporting system.

Class VIII. The battalion distribution point for Class VIII was the battalion aid station in the combat trains. We called requisitions for routine supplies in to the combat trains and provided them to the first sergeant when the LogPac convoy next arrived at the LRP. For immediate or controlled items, the physician's assistant or senior medic personally delivered these items to the unit. This allowed the medical leadership an opportunity to check the status of the six platoon medics. When a casualty arrived at the combat trains, we replaced Class VIII supplies used to treat the wounded soldier on a one-for-one basis.

We passed daily Class VIII requisitions from the battalion aid station to the field trains for processing by the forward support battalion. The LogPac convoy provided these, ensuring we maintained appropriate stockage levels in the battalion aid station.

Class IX. Using DA Form 2765-1 Request for Issue or Turn-In, the battery PLL clerk initiated routine requests for repair parts. These went by black satchel to the BMO or battalion maintenance representative, who put the parts on the unit pallet, when available.

We submitted requests for repair parts for deadlining deficiencies immediately

When the S3 orders his "hip-pocket" ammunition from the combat trains, it calls the field trains to restock this ammunition immediately.

to the combat trains. There the battalion maintenance technician or battalion maintenance supervisor queried the other three PLLs, which were forward as appropriate. Also, both maintained stocks of some common items (e.g., generators, regulators, rectifiers, etc.). If the repair part wasn't available forward, we called the rear element for the part.

This became a priority mission for the battalion maintenance officer. Once we located the part, we took it to the combat trains immediately and delivered it to the battalion maintenance technician or battalion maintenance supervisor. If the deadlined equipment was either a howitzer or tactical fire direction system (TACFIRE), we notified the TOC immediately.

Medical Evacuation

Perhaps the single most important element of CSS from the perspective of its impact on the soldier was that of reporting and evacuating casualties. There's no adequate way to explain to soldiers why they aren't promptly or correctly treated. Too often, units rely unreasonably on aeromedical evacuation. If these limited air assets are available, units must know how to use them. However, they must plan to care for and evacuate their soldiers.

The most limiting factor in treating casualties was the assignment of medical personnel. The medical section is authorized a physician's assistant, an NCOIC and 12 medics (see Figure 7).

• One per Firing Platoon	6
• Two in the Field Trains	2
• One in the Battalion TOC	1
• A Physician's Assistant, NCOIC and Three Medics in the Combat Trains	5
	Total 14

Figure 7: Battalion Medical Section Personnel

The number of medics isn't enough to meet the potential demand. We filled the void by participating in the Division's Combat Lifesaver Program. This Program provides advanced first aid skills to selected soldiers to augment the expertise the medics provide.

Units rely too heavily on aeromedical evacuation. Because of limited air assets, they must have a plan to care for and evacuate their soldiers.

The goal, which we attained, was to have one combat lifesaver in every section in the battalion.

Individual Casualties. We treated these in the forward location immediately after triage. The unit initiated appropriate documentation (e.g., DA Form 1156 Casualty Feeder Report and DA Form 1380 Record of Treatment). It notified the ALOC to anticipate casualties, and the unit transported the soldiers to the battalion aid station. Processing in the battalion aid station included casualty reporting, stabilization for evacuation and transportation to the BSA as necessary.

Mass casualties. One difference between individual and mass casualties is we had to notify the TOC in addition to the ALOC. Once a unit alerted the ALOC, the medical and transportation assets of the affected unit were augmented by assets from the combat trains.

We performed triage, treatment, documentation, reporting and evacuation as for individual casualties with help from battalion. We focused the XO's immediate attention on this unit. Once we cared for the casualties, we consolidated the remnants of the unit.

In most instances, we had to assemble the remaining howitzer sections with the surviving platoon under battery control. This proved to be more difficult than expected, requiring considerable time to move these sections into a battery configuration and, at the same time, allowing the surviving platoon battery computer system (BCS) to accept additional firing sections.

Nuclear, Biological and Chemical (NBC) Contaminated Casualties. These posed special problems. We had two types of contaminated casualties. First, we had soldiers who were suffering from the effects of a NBC attack. Second, there were soldiers who, although fully protected, were exposed to a NBC agent and were suffering from "conventional" wounds. For example, a soldier who was fully protected in mission-oriented protective posture, Level 4 (MOPP-4) gear and exposed to a chemical agent also had a broken leg.

In both instances, we had to decontaminate the casualty before he could enter the unit's evacuation system. The initial procedures included taking appropriate protective measures (e.g., don MOPP-4, use the M256 kit and render an NBC 4 report), as well as notifying the TOC and ALOC.

We assembled a hasty decontamination team at the battalion TOC. This team consisted of the battalion NBC officer and NCO, two medics and two HMMWVs with drivers. It augmented similar personnel from the affected platoon or battery.

The NBC officer selected and set up the decontamination site. The location of the site was sent to the unit along with a specific route to move the contaminated casualties to it. An escort

from the battalion team met the casualties at a designated link-up point to move them into the decontamination area.

We moved additional medics and evacuation vehicles, as appropriate, to the "clean" side to accept the decontaminated casualties. We used one of the two HMMWVs for this purpose and retained the other for command and control. Once the casualties were decontaminated, we processed them using the usual evacuation steps.

Several points about these procedures require emphasis. First, the time constraints for evacuating casualties preclude waiting to start decontamination and evacuation until after the battle. Second, the focus of these efforts is on contaminated casualties. We made no effort to immediately decontaminate the remainder of the unit. Third, considerable training is required to ensure the units don't send contaminated casualties to the combat trains. To ensure this, the entry guard of the combat trains was in MOPP-4, and he tested all personnel and equipment attempting to enter the combat trains for contamination. This requirement was in effect until the battalion S3 revoked it.

Maintenance. As expected, we established maintenance operations as far forward as possible. With rare exception, we corrected maintenance faults no farther to the rear than the combat trains.

Each battery had a habitually associated maintenance team that included a VTR. This team was split, with the VTR with one platoon and the maintenance truck and PLL trailer in the other. Each battery team had 100 percent of its personnel authorization, at the expense of the battalion maintenance team. This allowed the appropriate expertise to be well forward.

Replacing major components (e.g., transmissions, engines and transfers) called for verification of required repair by the battalion maintenance technician or battalion senior maintenance supervisor. It was critical we diagnosed faults extremely accurately and identified *all* repair parts needed. Once the diagnosis was complete, we radioed the list of repair parts to the field trains.

For major assemblies, the field trains dispatched a 5-ton wrecker and 5-ton long bed (from the MST) to the yard in the BSA. This allowed us to pick up our assemblies without waiting for lift support from the forward support battalion. The wrecker returned to the field trains while the 5-ton long bed was led to the combat trains after it collected all parts for the repairs.

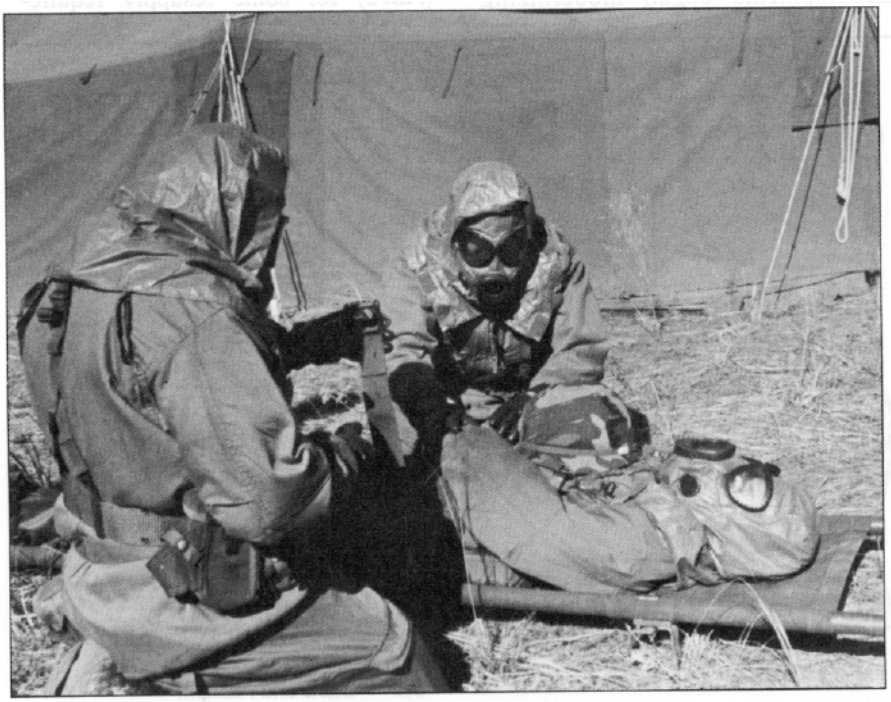
In the combat trains, we used the VTR from the appropriate battery for lift support for repairs. The OMCP was established near the combat trains, only if the number of "down" vehicles became excessive.

The success of the battalion's CSS system depended on execution. Toward that end, we included the elements of this system in a briefing presented to *every* soldier involved. The initial target audience was the command sergeant major and the battery first sergeants. Over time, we refined this system and staff officers became increasingly committed to its proper execution.

Conclusion

The integration of doctrinal procedures and proven techniques of CSS into Field Artillery organizations requires more than the dialogue established by this article. The Field Artillery School has taken the critical first step by appointing the Fire Support and Combined Arms Operations Department as the point of contact for CSS. This department will not only prescribe CSS doctrine for Field Artillery organizations, but also will coordinate these actions with the Logistics Center and other appropriate proponents.

The organization of CSS assets is a tough job, worthy of professional consideration by the Field Artillery community.



Two 2d Armored Division soldiers decontaminate a casualty, even though he's in MOPP-4, before they treat his wounds.

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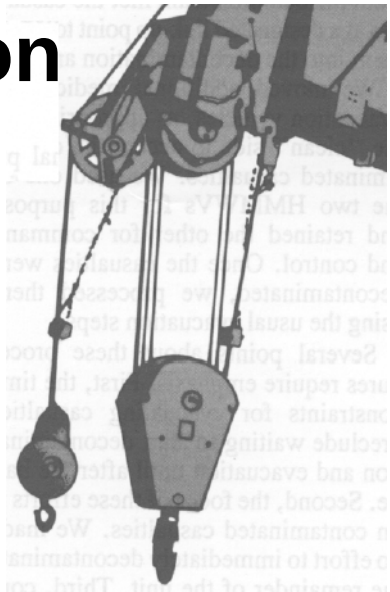
Major Lawrence R. Adair is assigned to the Readiness Group, Fort Sam Houston, Texas. He was S3 of the 2d Armored Division Artillery and Executive Officer of the 1st Battalion, 3d Field Artillery, both at Fort Hood, Texas. Major Adair also served as S3 of the 2d Battalion, 81st Field Artillery, 8th Infantry Division (Mechanized), West Germany. He commanded B Battery, 1st Battalion, 16th Field Artillery, Fort Hood, and Headquarters and Headquarters Battery, 8th Infantry Division Artillery.

Ammunition Distribution in Corps Operations



by Lieutenant Colonel Frank C. Davis III, OD, and
Lieutenant Colonel (Retired) Horace Dennis, Jr., OD

Arming tactical forces is the most extensive and time-sensitive challenge of the Army's logistical sustainment system. Ammunition combat service support (CSS) units must be able to provide the right mix and quantity of ammunition to the right location at the right time. If tactical forces are to realize maximum combat effectiveness for sustained periods, they must have arms for their weapons as far forward as the tactical situation will permit.

Today's tacticians and operational planners talk in descriptive phrases such as "high lethality," "intense combat," "kill zone" and "target-rich environments." We maneuver during short-duration "windows of opportunity" to fix the enemy and destroy him with maneuver and superior firepower. We deny his access to critical terrain and canalize his movement. We force him to deploy his first-echelon forces prematurely and commit his second echelon early. We interdict his logistics and destroy his fire support with counterfire. We break his momentum, block his penetration, destroy his formation, defeat his operation and prepare to counterattack inside his decision cycle.

We have many weapon, communication, engineer and intelligence systems performing essential roles to complete these complex tasks. Simultaneously, we're performing many joint efforts and significant logistical functions. But nothing impacts on our capability to succeed more than supplying the basic ingredient: ***ammunition.*** To fix, destroy, canalize, interdict, deny, block and defeat the enemy, we need *ammunition—on line, on time and in large quantities.*

The AirLand Battlefield can't afford large, easily identified, semi-mobile supply nodes in support of highly mobile tactical units. But the tactical commander must know he has "war stopper" assets, such as ammunition and petroleum, oils and lubricants (POL). Commodity managers and CSS unit commanders must be able to manage assets, forecast requirements and supply ammunition efficiently to support combat operations.

The US Army Ordnance Missile and Munitions Center and School, Redstone Arsenal, Alabama, is the proponent for the ammunition supply system for all forces operating in a given theater of operations. In 1983, the School recognized the current ammunition distribution system was unable to operate effectively on the AirLand Battlefield. The School's Directorate of Combat Developments began modernizing ammunition-related equipment and organizations and developing a more responsive, flexible and survivable ammunition resupply system.

Current System Problems

The current ammunition resupply system (see Figure 1) illustrates several deficiencies. Brigade ammunition transfer points (ATPs) can't provide enough tonnage for users; therefore, unit supply vehicles must travel to corps ammunition supply points (ASPs) for some resupply requirements.

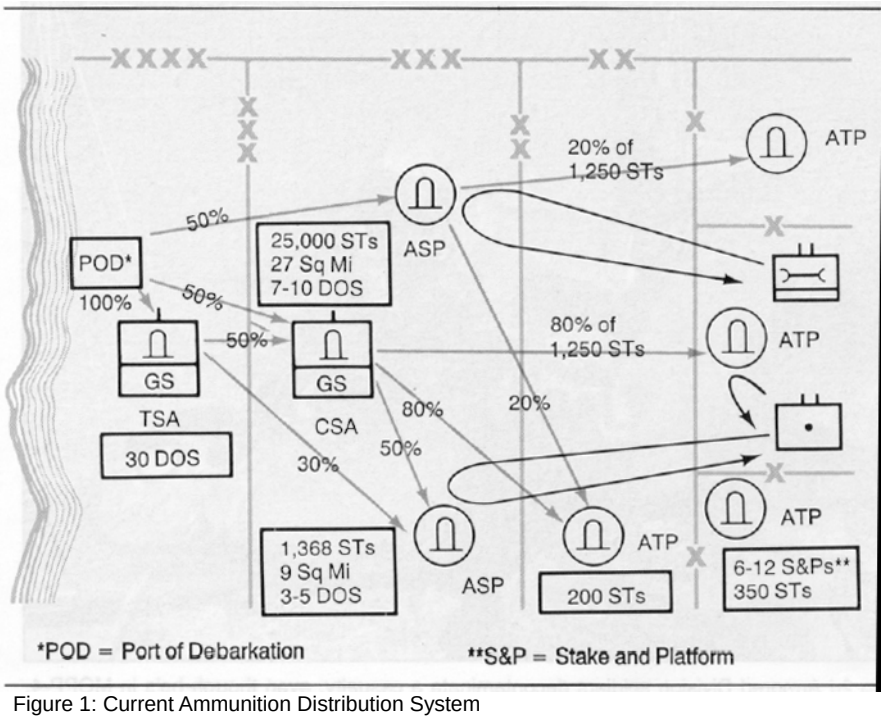


Figure 1: Current Ammunition Distribution System

Corps units, particularly artillery, also must use ASPs for most of their resupply because the rear ATPs each can handle only 200 short tons (STs) per day.

The total capacity of all four ATPs equals approximately 1,250 short tons per day or one-third of the heavy division's projected requirement of 3,500 short tons per day. Corps and division transportation assets must haul the rest from corps ASPs.

The ASPs offer the enemy large targets and are relatively immobile and ill-equipped to handle rapidly changing missions and non-linear operations. Not shown is a paper-oriented, totally unresponsive requisitioning and inventory management system that can't automatically forecast unit requirements, quickly calculate task-force requirements or update projections or usage fluctuations based on changing tactical dynamics.

The Three-Phase Solution

The School and the US Army Logistics Center, Fort Lee, Virginia, began a three-phased attack to solve the problems. First, the current fleet of materiel handling equipment (MHE)—forklifts and cranes—are 20-plus years old, cumbersome, maintenance-intensive and inadequate in lift capacity and flexibility. We developed and have funding for two new pieces of MHE. Both are replicas of proven civilian equipment. The 6,000-pound variable-reach, rough-terrain forklift (VRRTFL) and 65-ton rough-terrain container crane are the centerpieces of the proposed new fleet. Both provide increased lift capability, more versatility and improved maintainability.

The second phase of "the attack" involved a total redesign of the ammunition information management system. Currently, we have the standard Army ammunition system (SAAS) for ammunition units' internal distribution and inventory management. The redesigned system will eliminate paper requisition and give the battalion S4 the ability to compute requirements automatically and requisition, forecast and adjust for task-force organizations, varying intensities and changing threats.

In simple terms, brigade commanders use decision windows of hours, division commanders about a day and corps commanders two to three days. But the ammunition distribution system must be able to react to brigade and division maneuvers in hours, not days, and must be able to shift large volumes of munitions in support of corps operations. The SAAS doesn't provide enough timely management information to shift munitions without disrupting the entire system.

The third phase involved intensive doctrinal examination to improve ammunition distribution without increasing the number of soldiers required to operate the system. The results created the maneuver-oriented ammunition distribution system—MOADS. (See Figure 2.)

Solutions 1990-1997: MOADS

The MOADS capitalizes on improvements made through previous initiatives, addresses current needs and anticipates CSS support requirements on the battlefield of the future.

Under the current system (Figure 1), the forward ATP in each brigade of a heavy division provides 350 short tons

The 6,000-Pound Variable-Reach Rough-Terrain Forklift

The 65-Ton Rough-Terrain Container Crane

of ammunition per day, usually high-tonnage, high-volume artillery, tank and mortar ammunition and direct-fire missiles. The user must travel to the ASP near the division rear boundary to satisfy his low-volume (small arms, etc.) requirements and get high-volume items the ATP can't provide because of its limited lift capability.

The rear ATP operated by the main support battalion provides 200 short tons per day to support units operating in the division sector. Units draw requirements in excess of the 200 short tons per day from the ASP.

The MOADS (Figure 2) increases the capacity of the forward ATPs from 350 to 553 short tons per day and increases the capacity of the rear ATP from 200 to 970 short tons per day. We redesigned the direct support (DS) ammunition company to operate three ASPs and moved control of the rear ATP from the main support battalion (MSB) to the DS ammunition company (ASP). Also, we moved the ASPs forward into the division rear area. Two other significant changes are the user receives 100 percent of his requirements from the ATP, thus eliminating travel to the ASP, and the percentage of ammunition supplied from the corps storage area (CSA) and ASP to the forward ATPs has changed.

With these changes, MOADS provides one-stop service at the ATP, reduces the supply line by moving the ASP forward and increases the percentage of ammunition this node supplies to the ATP. They also reduce the size and signature of the ASP and allocate transportation assets to support MOADS.

MOADS-PLS

Fielding the palletized loading system (PLS) will complete the final phase of the MOADS concept and provide ammunition to the user in combat-configured loads (CCLs) rather than by single line-item issue or shipment (Figure 3). Based on the threat, task organization, availability of ammunition and other considerations, the corps commander approves the configuration of combat loads.

Ammunition arrives at the CSA general support (GS) ammunition unit in breakbulk or containers and at the ASP DS unit on PLS flatracks (loading platforms). Both the CSA and ASP preconfigure combat loads for shipment to the ATP and user units (75 percent at the CSA and 25 percent at the ASP). Both units stock ammunition on PLS flatracks.

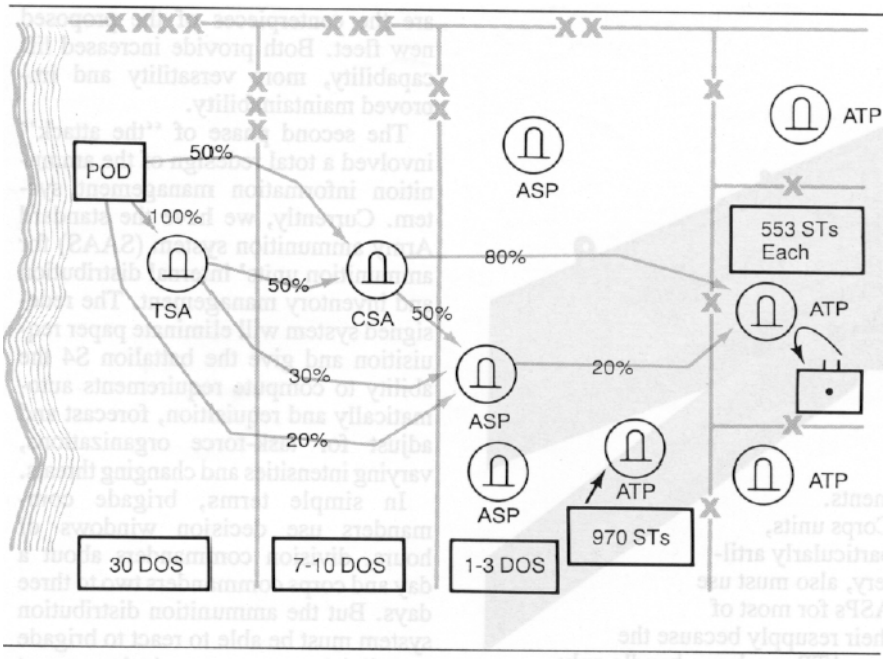
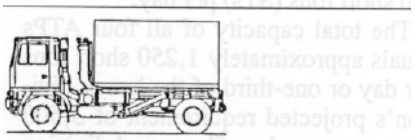


Figure 2: MOADS

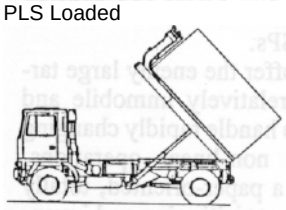
Current System
- Supply Point Distribution
- 2 ASPs per Division
  - 3 DOS
  - 4,500 STs per ASP
  - Distinctive Signature
- 2 Magazine Pallets per DS Ammunition Company
- 4 ATPs
  - 1,250 STs Total Capacity
  - All Operated by Division
- Structured to Support Defensive and Slow Offensive Operations
- Transportation in GS Role

MOADS
- 100% CCLs at ATP for Infantry, Armor, Artillery, Engineers, Air Defense Artillery and Aviation
- 3 Mini-ASPs per Division
  - 1 to 3 DOS
  - 2,000 STs per ASP (Average)
- 3 Magazine Pallets per DS Ammunition Company
- 4 ATPs
  - 2,600 + STs Total Capacity
  - 3 Operated by Division
  - 1 (Rear) Operated by DS Ammunition Company
- Structured to Support Defensive and Fast Offensive (AirLand Battle) Operations
- Allocate Ground and Air Transportation in DS of MOADS by Individual Sector

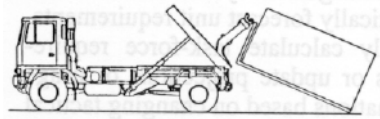
Comparison of Current Ammunition Distribution System to MOADS



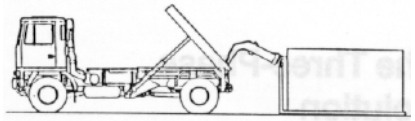
PLS Loaded



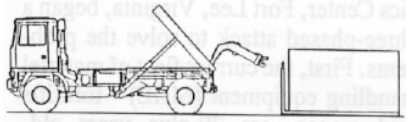
Sub-Frame Rotation



Hook-Arm Translation



Hook-Arm Rotation



Pallet Unloaded

PLS: An Artist's Rendition of an Unloading Sequence

As depicted in Figure 3, once the CSA transfers ammunition to PLS flatracks, we ship all ammunition using PLS. The only handling required is to

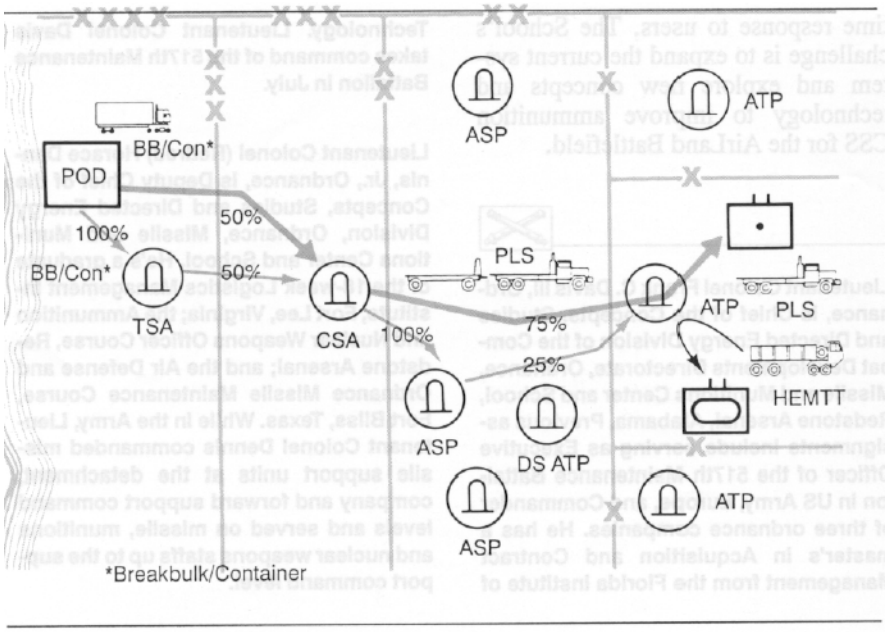


Figure 3: MOADS-PLS

preconfigure combat loads at the CSA and ASP, supply users not equipped with PLS at the ATP and fire the ammunition at the user location.

Preconfigured Loads. The ability to preconfigure and ship ammunition in CCLs and use flatracks to store and move ammunition throughout the corps drastically reduces the loading and unloading time, the number of times ammunition is handled and transportation requirements. These result in major potential savings in manpower, MHE, other vehicles' fuel consumption and maintenance. By shortening supply lines, dispersing storage sites and reducing the size of storage locations, we dramatically increase unit productivity, enhance survivability and significantly reduce the response time required to move ammunition to forward ATPs or user locations.

With this system, the user can order all or most of his ammunition by preconfigured loads yet still order individual line items. The system reduces the administrative burden throughout the supply chain.

Division/Corps Ammunition Supply Operations. Since artillery usage represents approximately 80 percent of the daily tonnage requirements, let's examine a possible resupply scheme. Assume three brigades are forward and the division artillery is in direct support. The multiple launch rocket system (MLRS) battery supports the 3d brigade as the main effort. A corps Field Artillery brigade is under the operational control (OPCON) of the division and is arrayed across the division rear in a general support reinforcing (GSR) role.

The division ammunition officer (DAO) plans ammunition resupply for all units in the division area. He has notified the corps materiel management center (MMC) to route all requirements for 3d brigade units, the division artillery DS battalion and the MLRS battery to 3d brigade's ATP.

Can they handle it? Yes! We up-gunned the ATP to handle 553 short tons under usual operations and surge to 880 short tons, as required. If surge requirements extend beyond a day, we can move in additional personnel and equipment from other brigade ATPs or from the DS ATP.

The DS ammunition company ATP in the division area supports the corps Field Artillery brigade. That ATP usually can handle 970 short tons per day and surge to 1,200 short tons.

Suppose the tactical situation requires two corps battalions to move to the 1st brigade. The DAO directs the battalions to resupply unit trains from the DS ATP while simultaneously directing future resupply from the CSA to the 1st brigade ATP.

Ammunition resupply and ammunition units must be as flexible as combat units. If combat units can't provide the punch when needed, tactical maneuver is useless.

We gave each division a DS ammunition company under Total-Army Analysis 96 force-structure allocations. While assigned to corps, the company will operate in a habitual DS relationship with a committed division.

Doctrinally, it can establish up to three ASPs and one ATP. The three ASPs can store up to three days of supply (DOS) for the division or one DOS each. Doctrinal employment is flexible, which is why we say "up to" three ASPs. In certain situations, three is too many. It's up to the division and corps commanders.

The DS ATP is an additional supply capacity the division commander can use and position as required. He could use it to reinforce another ATP or divide it between two brigade ATPs. The DAO is the division expert, there to advise the commander.

Additionally, if the unit needs only two ASPs, the DS ammunition company could position soldiers and equipment in forward ATPs or establish an ASP along an anticipated axis of advance for deep-attack operations. Imagine the possible benefits to establishing an ASP far forward just before a passage of lines by an attacking division. We could reduce significantly the logistical tail following that attacking element.

In essence, MOADS modifies ammunition asset employment doctrine in the division area to provide more flexible, responsive support. The CSA and theater storage area (TSA) essentially operate as before but with greatly enhanced equipment and movement capacities.

Key Elements of MOADS

1. Completely redesigns ammunition units.
2. Increases the capacity of all transfer points.
3. Resupplies 100 percent of combat units' needs through the ATPs.
4. Moves the ASPs forward and downsizes their capacities.
5. Services corps combat units through division ATPs.
6. Enhances flexibility of the doctrinal employment of ammunition assets.

Advantages of MOADS

1. Provides more user-oriented support.
2. Reduces vulnerability.
3. Reduces paperwork.
4. Increases flexibility.
5. Supports AirLand Battle doctrine.
6. Provides adequate ATP capacity.

Conclusion

The MOADS streamlines the movement of ammunition throughout the theater of operations to provide our highly mobile tactical forces the right ammunition at the right place and time. The MOADS with PLS increases the handling capability of ammunition supply units, disperses stocks to enhance survivability, provides greater ease of movement of supply point locations and reduces the travel time for users to replenish on-board ammunition.

While these initial efforts significantly improve the supply system, additional challenges are surfacing. AirLand Battle Future and other major studies are identifying the need for further improvements to increase real-time response to users. The School's challenge is to expand the current system and explore new concepts and technology to improve ammunition CSS for the AirLand Battlefield.

Lieutenant Colonel Frank C. Davis III, Ordnance, is Chief of the Concepts, Studies and Directed Energy Division of the Combat Developments Directorate, Ordnance, Missile and Munitions Center and School, Redstone Arsenal, Alabama. Previous assignments include serving as Executive Officer of the 517th Maintenance Battalion in US Army, Europe, and Commander of three ordnance companies. He has a master's in Acquisition and Contract Management from the Florida Institute of Technology. Lieutenant Colonel Davis takes command of the 517th Maintenance Battalion in July.

Lieutenant Colonel (Retired) Horace Dennis, Jr., Ordnance, is Deputy Chief of the Concepts, Studies and Directed Energy Division, Ordnance, Missile and Munitions Center and School. He's a graduate of the 18-week Logistics Management Institute, Fort Lee, Virginia; the Ammunition and Nuclear Weapons Officer Course, Redstone Arsenal; and the Air Defense and Ordnance Missile Maintenance Course, Fort Bliss, Texas. While in the Army, Lieutenant Colonel Dennis commanded missile support units at the detachment, company and forward support command levels and served on missile, munitions and nuclear weapons staffs up to the support command level.

Redleg News

ITEMS OF GENERAL INTEREST

PERSCOM Update: Field Artillery Officer Branch

Address Change

The Field Artillery Officer Branch address has changed due to the Agency's recent name change from the Total Army Personnel Agency (TAPA) to the Total Army Personnel Command (TAPC), referred to as PERSCOM.

Lieutenant Colonel and Below:
Commander, US Total Army Personnel Command
ATTN: TAPC-OPE-F
200 Stovall Street
Alexandria, Virginia 22332-0414

Lieutenant Colonel (P) and Colonel:
Commander, US Total Army Personnel Command
ATTN: TAPC-OPC
200 Stovall Street
Alexandria, Virginia 22332-0400

Field Artillery Officer Branch telephone numbers remain the same.

All numbers are AUTOVON 221-xxxx or commercial (202) 325-xxxx.
Company Grade Officers: 0116/0187
Field Grade Officers: 7817/0118
Lieutenant Colonel(P) and Colonel: 7862/7863

Microfiche Request Address for Officers: include your name, social security number, mailing address and signature.

Commander, US Total Army Personnel Command
ATTN: TAPC-MSR-S
200 Stovall Street
Alexandria, Virginia 22332-0444

All officers based in the continental US should keep current their home (mailing) address, as listed on their officer record brief (ORB), to ensure they receive correspondence from Field Artillery Officer Branch in a timely manner. Although the standard installation/division personnel system (SIDPERS) updates ORBs and gives Field Artillery Officer Branch access to unit addresses, we have no way to ensure ORB home addresses are current. Officers make changes through the officer records section.

OERs: Center-of-Mass Ratings

Department of the Army selection boards continue to report the officer evaluation report (OER) system is still very healthy and is providing the information required for their

deliberations. Although the entire report is useful, the center-of-mass concept, as applied to the senior-rater profile, is the prime contributor to the report system's usefulness.

The center-of-mass concept groups senior-rater block checks into three categories, based on the senior rater's profile: above-center-of-mass, center-of-mass and below-center-of-mass. Center-of-mass is the block where the profile indicates the vast majority of rated officers fall.

Generally, officers who are doing well with potential for continued schooling and promotion receive center-of-mass block checks, with the above-center-of-mass block checks reserved for the officers with the greatest potential. Block checks below center-of-mass are for officers who don't measure up to standards and have limited potential.

Too many officers are still under the mistaken impression that unless they receive all above-center-of-mass reports from their senior raters, their chances for selection are greatly diminished. Nothing could be further from the truth. However, with recent reduced selection rates, officers who receive nothing but center-of-mass reports from a number of different senior raters may be at risk. Below-center-of-mass block checks generally indicate a lack of potential for further schooling or promotion.

Majors Promotion Boards...Get Ready Early

The last majors promotion board results were published recently, and with this subject fresh in your minds, those eligible should start preparing for next October's majors board. Year Group 80 will be in the primary zone (PZ), while Year Group 81 will be looked at below the zone (BZ). The board sees three items: the Department of Army photograph, promotion officer record brief (ORB) and performance (P) microfiche. The only item provided to the board by Field Artillery Officer Branch is the photograph.

Here's what you do to get ready for the board early.

1. Order Your Microfiche Today! Don't put it off; its very easy and free. Most battalion executive officers or S1s have the standard order form. If they don't, just send a sheet of paper with your name, social security number, request and signature to the US Army Total Army Personnel Command, ATTN: TAPC-MSR-S, 200 Stovall Street, Alexandria, Virginia 22332-0444.

Correcting your fiche can be a long and painful process, so start now. If you get your fiche and some awards are left out, don't panic. The awards are sent to the fiche office only when your next officer efficiency report (OER) arrives. If your fiche has six or more frames that read "See Next Frame" or if you have an unreadable frame, call us and we'll try to correct it.

Officer Common-Use References

• Advanced Civil Schooling and Degree Completion Programs	AR 621-1
• Conditional Voluntary Indefinite (CVI)/Final Voluntary Indefinite (FVI)	AR 135-215
• Height/Weight Standards	AR 600-9*
• Leaves and Passes	AR 630-5*
• Officer Assignment Policies, Details and Transfers	AR 614-100**
• Officer Evaluation Reporting System	AR 623-105***
• Officer Professional Development and Utilization	DA Pam 600-3**
• Officer's Guide to the ORB	DA Pam 640-1
• Officer Promotions	AR 624-100**
• Regular Army (RA) Appointments	AR 601-100
• Regimental System	AR 600-82
• Release from Active Duty (USAR Officers)	AR 635-100
• Resignations (RA Officers)	AR 635-120

*Contained in the *All Ranks Personnel Update*
**Contained in the *Officer Ranks Update*
***Contained in the *Personnel Evaluations Update*

2. Correct Your ORB Early (Six to Eight Months Out). The military personnel office (MILPO) or personnel service center (PSC) will contact you to sign your promotion ORB 60 to 90 days before the board starts. This is the ORB the promotion board sees. Before you sign that ORB, make sure it's correct. If you've attempted to fix it, but it still isn't right, make neat, legible corrections on the ORB and sign it. The ORB will be sent directly to the promotion board by the MILPO or PSC.

The board won't see electronic corrections made at your location or at Field Artillery Officer Branch after you've signed the ORB. The board likes to see the signed ORB because it tells them the officer personally reviewed the information.

Some officers bypass MILPO or PSC and send corrections to the Field Artillery Officer Branch, but we can't update many of the items on the ORB here. This usually means the hard- copy ORB the board sees won't be correct either. Only in extreme cases should your corrections come to Field Artillery Officer Branch. However, if you absolutely can't get the MILPO or PSC to "get it straight," have them write or call us, and we'll sort it out.

By starting early, you can prevent the panic mode in August and September. We certainly are available to discuss problems, but the time to get ready for the board is six to eight months out, not one.

3. Photographs Are Important! We know the regulation says have a photograph every three years, but we have a few recommendations. Get a quality photograph taken six months before the board looks at you for major BZ. This helps maximize your chances for BZ selection, and your photograph is ready for your PZ consideration.

Have someone else check your photograph before sending it to Field Artillery Officer Branch. Yes, we do see some

almost unbelievable photographs (brass wrong, no nametag, etc.). It's worth the time to check it before mailing. A current preference statement with your telephone numbers makes it easy for us to call if we see a problem.

4. Letter to the Board—Is It Necessary? Avoid letters to the president of the board. If you feel you need to send a letter, call us first. Many letters are unnecessary and may even damage your chances because they can sound self-serving to board members. Let your file represent you. It took you years to build it, and you don't want one letter jeopardizing that hard work. There are cases when you might want to send a letter, but we recommend you call us first.

It isn't hard to get ready if you start early, and you might have some sleepless nights if you wait.

Lieutenant Branch-Detail Program

Captain promotion boards will continue to consider other than Regular Army (OTRA) officers for both promotion and conditional voluntary indefinite (CVI) status. CVI applications aren't required for selection. Officers selected for promotion are automatically offered CVI status.

In the past, a rebranch board convened on the heels of every captain and CVI board to consider all OTRA officers (and Regular Army volunteers) for rebranching to shortage branches. The March 1989 captain and CVI board was the last one to include such a rebranch board. In the future, officers from overage branches (Infantry, Field Artillery, Armor, Air Defense Artillery and Chemical) will be transferred to the shortage branches under the branch-detail program.

The Lieutenant Branch-Detail Program provides for branch alignment by assigning new lieutenants to a detail branch (Infantry, Field Artillery, Armor, Air Defense Artillery or Chemical), then transferring them to their basic branch as captains. All reserve officers' training corps (ROTC) and officer candidate school (OCS) accessions are considered for the branch-detail program.

After commissioning, our branch-detail officers attend the Field Artillery Officer Basic Course and serve their initial tour (three to four years) as Field Artillery officers. Branch-detail officers are eligible for all Field Artillery assignments worldwide. Upon completion of this first tour, branch-detail officers transfer to their basic branch and attend the officer advanced course in that branch.

The following outline indicates the number of Field Artillery officers currently designated as branch-detail officers.

Year Group	Total FA	Total Branch Detailed
87	790	69
88	710	104
89 (Projected)	910	259

Artillery Representation at the Maneuver Advanced Courses

To be the best fire supporter possible, you must thoroughly study maneuver tactics and methodology. We recommend you consider attending the Infantry or Armor Officer Advanced Course.

Our intent is to expose proven, high-potential artillerymen to firsthand maneuver tactics, procedures and doctrine for future assignments as battalion and brigade fire support officers (FSOs). In turn, these officers will be high-quality representatives of our Branch to continue that important liaison between maneuver and fire supporters. But, are you qualified to attend?

Selection Criteria. To qualify to attend the Armor or Infantry Officer Advanced Course, you must—

- Volunteer to attend.
- Have a strong grade point average (GPA) in undergraduate studies.
- Have achieved or exceeded course standards in the Officer Basic Course.
- Be a graduate of or volunteer for leadership schools: Ranger, Airborne and Pathfinder.
- Have extensive time in fire support assignments.
- Have completed a firing battery assignment as a fire direction officer, executive officer or platoon leader.
- Have sustained a high level of performance.

Pre-Training and Follow-On Schooling. If selected, officers will attend the Tactical Fire Direction System (TACFIRE) FSO Course at Fort Sill, Oklahoma, whenever possible. Selectees may go to Ranger, Airborne or Pathfinder School, based on school availability and their reporting dates. The gaining commands then will determine follow-on courses, based on projected assignments.

Follow-on Assignments. Infantry Officer Advanced Course graduates will be assigned to direct support battalions supporting infantry brigades (light and heavy). Armor Officer Advanced Course graduates will be assigned to direct support battalions supporting armor brigades. Their assignment will be preceded by a letter from the Field Artillery Officer Branch Chief to the gaining battalion commander specifying their qualifications to be battalion or brigade FSOs and future battery commanders.

Conclusion. Our goal is to send five Field Artillery officers to each Infantry Officer Advanced Course (five classes per year) and two to each Armor Officer Advanced Course (four classes per year). Officers will be chosen on best-qualified criteria.

Selectees may go to Ranger, Airborne or Pathfinder School.

The Field Artillery Officer Branch policy is to send the right officer at the right time with the right skills to maneuver advanced courses. By doing this, we can enhance the maneuver community's confidence in our support of the combined-arms team and professionally develop each officer to be a high-quality fire supporter.

PERSCOM Update: Field Artillery Enlisted Branch

Address Change

The Field Artillery Enlisted Branch address changed recently with the Agency's name change from the Total Army Personnel Agency (TAPA) to the Total Army Personnel Command (PERSCOM).

Commander
US Total Army Personnel Command
ATTN: TAPC-EPK-F
2461 Eisenhower Avenue
Alexandria, Virginia 22331-0452

The Field Artillery Enlisted Branch telephone numbers remain the same: AUTOVON 221-0304 or commercial (202) 325-0304.

Volunteering for Overseas Service

Misconceptions about the procedures for submitting volunteer applications for overseas tours have led to the myth that a soldier can only volunteer for overseas service in general, listing up to three areas of choice. The myth further supports the notion that a soldier is assigned an area based solely on the fact that he volunteered for an overseas tour, regardless of the area he requested.

AR 614-30 Overseas Service, Chapter 5 (part of the *Department of the Army Enlisted Ranks Personnel Update*), outlines the guidance for submitting applications to volunteer for overseas service. A soldier applies on DA Form 4187 and can list up to three choices of overseas areas, but must list at least one.

Those who volunteer for overseas service are considered with other soldiers of the same grade and qualifications but aren't selected before those soldiers who have more time on station. A soldier is eligible for worldwide assignment, based on Army needs, while his overseas request is being considered.

For example, a soldier can volunteer for overseas service in Korea by submitting a DA Form 4187 with only one choice. When the Army needs a soldier in his grade and MOS for Korea, each volunteer is considered for that assignment. In the meantime, if he meets the qualifications for an assignment to Germany, then he may be selected for that assignment. Volunteering for an oversea area simply indicates your preference to be reassigned to that area.

If soldiers have questions about volunteering for overseas service, call Sergeant First Class W.L. Lookingland at PERSCOM.

TADS/PNVS

In September 1988, the US Army Aviation Systems Command (AVSCOM), St. Louis, Missouri, awarded a $3.7 million contract to Martin Marietta Electronics Systems of Orlando, Florida, to initiate Stage I of a multistage improvement program (MSIP) for the target acquisition and designation sight/pilot night vision sensor (TADS/PNVS) system. The TADS/PNVS improvements will become part of Stage I MSIP Apache, an improvement program contract for $19.1 million awarded to McDonnell Douglas Helicopter Company by AVSCOM in August.

The TADS/PNVS system provides day, night and limited adverse weather targeting information and night navigation capabilities for the Army's AH64 Apache, essentially serving as the eyes and gun sight for the Army's tank-killing helicopter. *The TADS laser also can designate targets for remote attack by other helicopters or by artillery units firing laser-guided projectiles.*

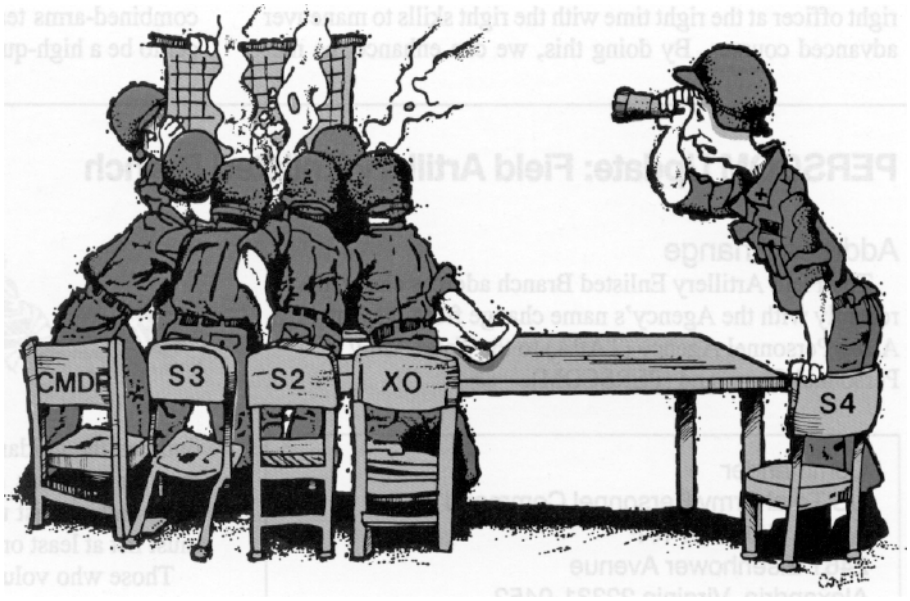
The TADS/PNVS MSIP will provide improved targeting and operation, reduced co-pilot/gunner workload, improved reliability and enhanced maintainability, air-to-air missile and gun capability and integration with the MSIP Apache system.

The TADS consists of a rotating turret mounted on the Apache's nose, an optical relay tube in the co-pilot/gunner station, three electronics units in the avionics bay and cockpit-mounted controls and displays. It provides the co-pilot/gunner with search, detection, recognition and laser designation capabilities through direct-view optics, television and FLIR sighting systems. Once acquired by TADS, targets can be tracked manually or automatically for autonomous attack with guns, rockets or Hellfire missiles.

Bob Hunt
Public Affairs Office
USA Aviation Systems Command

Logistical Training for Pathfinder's Power

by Colonel John M. Pickler
and Major John D. Biggs



In 1986, the 8th Infantry Division (Mechanized) Artillery (Div Arty), the Pathfinder Division, US Army, Europe, implemented a five-day standardized external evaluation (SEE). We spent two days in a maneuver rights area (MRA) and three days on a live-fire and maneuver exercise in the Grafenwoehr Training Area. Previous SEEs and this one pointed out glaring weaknesses in our concept of support.

In this SEE, the logistical requirements for a direct support (DS) artillery mission were clearly defined. The DS battalion operated in a brigade sector, and the brigade's forward support battalion functioned under an area support concept. The battalion support operations center (BSOC) worked closely with the brigade's field trains, collocated with the forward support battalion in the brigade support area (BSA). The Div Arty monitored the logistical status while the BSA executed logistical resupply operations.

Everything was in a neat logistical package. But we discovered a weakness: we weren't routinely exercising the difficult logistical coordination demanded by other Field Artillery tactical missions.

In Europe, not every brigade always is committed to the close battle. Operations of the covering force together with those in the rear battle area and contingency missions also require resources. DS battalions are just as likely to have reinforcing (R), general-support reinforcing (GSR) or general support (GS) missions at some point in the battle.

The unique and challenging demands of these other missions suddenly "untied" our neat logistical package for DS operations. With platoons dispersed across the division front, the logistical support picture becomes complicated. We found that the logistical support transition from GS or GSR to DS, and vice versa, quickly becomes critical to sustain continuous fire support, as well as logistical support.

The inexperienced commander worries about tactics while the truly great commander is most concerned with logistics.

Extended SEE and REFORGER

In August 1987, we developed a six-day SEE. The initial phase of three days in the MRA changed to phase two in the major training area with no tactical pause. This transition resulted in a mission change from GS or GSR to DS in support of a new operations plan. We no longer had just two days of logistical play. Instead, we had a major logistical operation requiring a battalion to move 60 kilometers and deploy in support of its new mission.

Based on lessons learned during the extended SEE, we refocused attention on wartime support plans. We exercised internal 3x8 logistical operations thoroughly and validated them tactically during return of forces to Germany (REFORGER) 88. The REFORGER also underscored the external coordination problems of dealing with changing support battalion relationships caused by changes in tactical missions.

Logistical Terrain Walk

After REFORGER, we continued to reexamine the logistical support requirements of the general defense plan (GDP). We had a three-day logistical terrain walk to exercise and evaluate the plan and confirm support site locations.

This article discusses some of the logistical areas we evaluated in our logistical terrain walk.

Phase I: Briefings

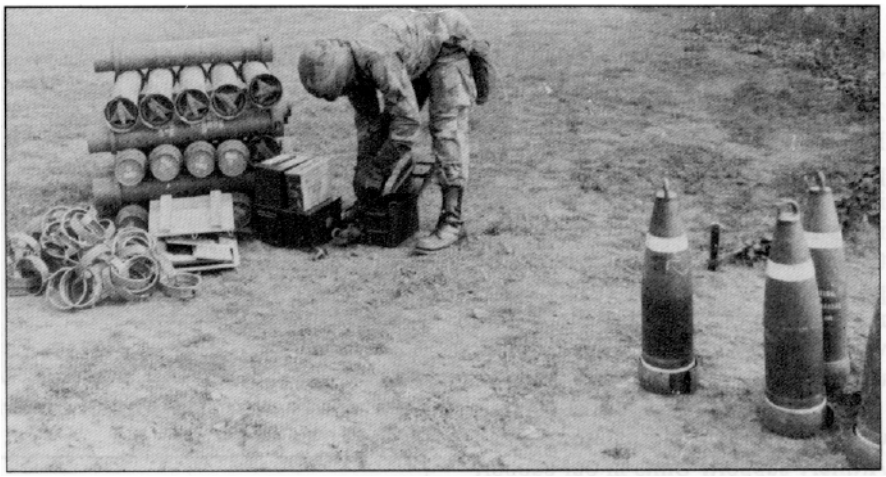
First, we provided a briefing on tactical and logistical operations to the Division support command (DISCOM) commander, support plan and operations officer (SPO), Division ammunition officer (DAO), forward support and main support battalion commanders and their SPOs, G-4 plans and operations and Division G-3 plans and operations staff members. For many on the support side, it was the first glimpse of a total Field Artillery support plan and its inherent logistical challenges, since the briefing included not only our Div Arty, but also representatives from all artillery units in our Division's GDP sector.

Class III. With an 11,000-gallon haul capacity, we found no outstanding

Logistical Lessons Learned (Or Relearned)

- The S4 needs a vehicle authorized in the modified tables of organization and equipment (MTOE) to coordinate with the BSA, LRPs and the battalion TOC.
- Ammunition vehicles must travel in groups with secure radios.
- The AN/GRC-160 radio in the heavy expanded-mobility tactical truck (HEMTT) is not powerful enough to maintain contact with the BSOC or TOC during ammunition resupply operations in the hilly German countryside.
- Sleep plans for the ammunition section impact significantly on sustained ammunition resupply operations.
- Support platoon soldiers require land-navigation training, even more than firing battery soldiers. All too often, a section of HEMTTs, petroleum, oils and lubricants (POL) tankers, water resupply trucks or an ambulance must be on the road unsupervised by senior NCOs. These sections have to know both the logistical and tactical plans. Because they are usually independent operators on the battlefield, they must be able to make decisions when "Murphy" appears on the supply route. Strip maps and rally points are essential for success.
- The BSOC and TOC must coordinate continuously.
- Units must address evacuating soldiers killed in action from the headquarters and headquarters battery (HHB) in field standing operating procedures (FSOPs).
- Ammunition vehicle traffic from the HHB to ATPs is not the norm; therefore, units must make provisions to accomplish this task.
- Simulations in logistical support often mislead commanders regarding their unit's ability to accomplish these important tasks.
- The need for Class III supplies in cold weather is significantly higher than in warmer weather because of the proliferation of heaters and increases in vehicle idling.
- Switching support battalions in the middle of operations requires detailed coordination to ensure all classes of supply requisitions are forwarded to the unit.

issues in resupplying Class III to Field Artillery battalions. The Division recently enhanced its "refuel on the move" capabilities to allow a battalion to refuel in less than an hour before occupying its initial position. This operation allows units to begin combat operations with full tanks. This is in contrast to our previous fuel-tanker level of 40 percent after internal refuel operations in support of the movement from our garrison area to forward defensive positions.



Preparing a Howitzer or Field Artillery Ammunition Support Vehicle (FAASV) Rearm Cache

Class VIII. Our Class VIII resupply plans were adequate. We identified a critical need for a battalion surgeon or physician's assistant (PA) during the initial stages of the battle. The peacetime decision to remove PAs from battalions significantly degraded the medical care available to a unit at the onset of hostilities. The Field Artillery School at Fort Sill, Oklahoma, successfully fought to keep PA authorizations, and when the Div Arty is fully resourced, this shortfall will disappear.

Class V. Ammunition problems centered primarily on limited ammunition transfer point (ATP) capabilities. Under normal operations, a forward support battalion ATP can move from 400 to 500 short tons of ammunition for all units in its area-support radius. During surge operations, it can supply up to 700 short tons of ammunition. This is enough to support a three-or-four-battalion maneuver brigade with a DS artillery battalion and other "slice" elements.

Unfortunately, those are only the initial customers. In some areas, the addition of one or more GS and GSR 155-mm battalions, one or two batteries of 203-mm howitzers and a multiple launch rocket system (MLRS) battery far exceeds even the surge capacity of the forward support battalion ATP. In isolation, each support battalion had been comfortable it could handle the ammunition requirements in its support area.

The graphic portrayal of divisional Field Artillery battalions and corps artillery units with GS, GSR or R missions in the Division area of operations quickly revealed a major shortfall in Class V support in some areas of the Division sector. This resulted in our more realistically positioning all ATPs to support the main effort as well as our identifying the additional transportation assets necessary to support the ATPs.

Along this line, the DAO designed standardized menu loads by type of ammunition. He identified each load with varying mixes of complete rounds of dual-purpose improved conventional munitions (DPICM), high explosive (HE), family of scatterable mines (FASCAM), etc., for 155-mm, 203-mm and MLRS units. Depending on current and future missions, units request ammunition by type of load, allowing the ATP to receive trailers with preconfigured loads from the ammunition supply points (ASPs), thus streamlining ammunition transfer operations.

Class IX. Discussion about another problem area, Class IX, proved to be equally eye-opening. Our Division's stationing configuration of brigades dispersed throughout the western central part of the Federal Republic of Germany with several battalion-sized units in separate sub-communities creates some natural peacetime constraints.

Primarily, the forward support battalions in two of our communities have no collocated artillery battalion to support and, therefore, have no authorized stockage list (ASL) of artillery items. In addition, deploying ASL packages to forward support battalions with no garrison support requirements is cost-prohibitive. We solved the problem by developing ASL push packages, maintained at the main support battalion (MSB), that go forward with the forward support battalions when they deploy.

Of further concern was support for our reinforcing 203-mm howitzers. With the inactivation of the Div Arty's 203-mm battalion in August 1987, the DISCOM no longer had an ASL to support 203-mm units. We resolved this by identifying a push package of ASL items from corps artillery support battalions and getting maintenance support teams (MSTs) from corps maintenance support battalions that will deploy with our corps artillery units.

Class IX resupply is further complicated by the dynamic nature of Field Artillery support. Units in our support area today may find themselves in another brigade area tomorrow. As with Classes I and III, orders for Class IX require forwarding addresses when a mission or area of operation changes. Units not only must forecast future needs, but also relentlessly coordinate to complete the transfer of logistical responsibilities to the gaining forward support battalion.

Phase II: Reconnoitering

After DISCOM staff and G-4 discussions, the Field Artillery battalion executive officers, service battery commanders, S4s and ammunition platoon leaders went forward to reconnoiter and confirm logistical support sites. We discussed host-nation support operations in detail and selected sites for logistical operations. Each unit briefed the Div Arty commander on its medical and casualty evacuation plans and graves registration procedures. Finally, we ended the terrain walk by walking through our forward storage area, reconnoitering the area in detail and discussing ammunition download operations.

Phase III: Implementing the Results

As a result of logistical issues raised during earlier exercises and examined in detail during the terrain walk, we developed more realistic GDP logistical plans and incorporated logistical operations into our SEEs in November and December of 1988. We alerted the evaluated units to go on a 40-kilometer road march to their initial defensive positions. Before occupying its positions, the main support battalion refueled the battalion on the move.

Ammunition Platoon. The battalion ammunition platoon moved to its initial battery or platoon locations to download basic-load ammunition and reported to the forward storage site (FSTS) staging areas. We then called the platoon forward by sections to load ammunition and disperse it to battalion cache sites. We used several flatbeds of training ammunition to exercise the ammunition crews fully.

The FSTS operations continued for 40 hours. We then directed the ammunition platoon to an ATP where operations continued. After receiving a change in tactical mission, the unit went on a 60-kilometer road march and rearmed, resupplied and refueled before occupying new positions at Grafenwoehr.

Medical Section. We closely evaluated medical operations. Soldiers were

Wartime host-nation support (WHNS) will provide many classes of materials, such as the barrier materials here.

TYPE LOAD Example 1 (155-mm DPICM)

CARGO:

DODIC	NOMENCLATURE	QUANTITY	PALLETS	WEIGHT	CUBE
D533	PROP CHG RED BAG M				
D541	PROP CHG WHITE BAG				
D563	PROJO DPICM M483A1				
N285	FUZE MTSQ M577				
N523	PRIMER				
TOTAL					

STONS CU FT

TYPE LOAD Example 2 (155-mm Mixed) M872 Trl

CARGO:

DODIC	NOMENCLATURE	QUANTITY	PALLETS	WEIGHT	CUBE
D533	PROP CHG M119				
D541	PROP CHG M4				
D544	PROJO HE M107				
D563	PROJO DPICM M483A1				
D579	PROJO RAP M549				
N285	FUZE MTSQ M577				
N523	PRIMER				
TOTAL					

STONS SU FT

TYPE LOAD Example 3 (155-mm FASCAM) M872 Trl

CARGO:

DODIC	NOMENCLATURE	QUANTITY	PALLETS	WEIGHT	CUBE
D502	PROJO ADAM M731				
D509	PROJO RAM M718				
D541	PROP CHG WB M4				
N285	FUZE MTSQ M577				
N523	PRIMER				
TOTAL					

STONS CU FT

Developing ammunition load menus enhances ATP support.

identified as casualties, requiring the medics to take appropriate actions. Soldiers wounded in action were evacuated to the battalion aid station or the field hospital, as necessary. We prohibited simulations, which ensured we exercised all medical evacuation procedures.

We used "resusci-annie" mannequins to replicate soldiers killed in action. This made units follow their graves registration (GRREG) procedures, properly identify remains and transport them to the graves registration point collocated with the ATP.

We used ammunition vehicles to haul casualties back to the GRREG site while platoons submitted wartime casualty feeder reports to the BSOC. Based on the casualty feeder reports, we replaced troops, using soldiers wounded in action who were evacuated beyond the battalion aid station. The battalion S1 had to pick up replacements from the BSA and inprocess them into units while at the MRA and Grafenwoehr.

BSOC Operations. During the six-day SEE, units averaged 250 miles per track, 300 miles per wheeled vehicle and almost 450 miles per ammunition vehicle. The total mileage of the maneuver plus the bitterly cold weather taxed the Class III forecasting abilities of the BSOC. Units' requests for Class III supplies became critical before a major road march to support a key operation.

Recovery procedures, maintenance collection points and Class IX repair parts supply from field locations exercised the maintenance operation. We pushed mobile Class III to units and the forward support battalion provided them water resupply points, requiring the BSOC and tactical operations center (TOC) to continually communicate the resupply status.

The logistician draws the line beyond which the tactician cannot advance.

Conclusion

The SEEs and our terrain walk have helped our battalions further refine their war plans. The SEE concept is definitely not new. However, our strong emphasis on realistic logistical operations has been beneficial. Operations, which were previously notional or one-time events, became daily problems requiring detailed planning and continual coordination with the forward support battalion to move the battalion successfully 80 kilometers to its final objective.

Too often, units simulate these actions, sacrificing logistical play to emphasize gunnery. But without integrating detailed logistical planning into current and future operations, commanders and operations officers are missing a critical part of the battle and are doomed to fail.

Colonel John M. Pickler commands the 8th Infantry Division (Mechanized) Artillery in US Army, Europe. He commanded the 2d Battalion, 81st Field Artillery, 8th Division; and C Battery, 2d Battalion, 19th Field Artillery, 1st Cavalry Division, the latter in Vietnam. Colonel Pickler also served as Chief of Staff of III Corps Artillery, Fort Sill, Oklahoma.

Major John D. Biggs is the S4 of the 8th Infantry Division Artillery. He commanded B Battery, 3d Battalion, 17th Field Artillery, VII Corps Artillery, West Germany; the Arnold and Saint Charles, Missouri, Recruiting Companies, US Army Recruiting Command; and Headquarters and Headquarters Battery, 82d Airborne Division Artillery, Fort Bragg, North Carolina.

View from the Blockhouse

FROM THE SCHOOL

Light Division Artillery Automation

In November 1989, the Army will begin fielding an interim automated system for the light divisions. This system will be a mixture of different pieces of equipment interoperating to provide an automated capability. Equipment to be fielded includes the briefcase terminal (BCT), the fire support team digital message device (FIST DMD), the digital communications terminal (DCT) and the forward entry device (FED). The DCT will be fielded to the 7th Infantry and 82d Airborne Divisions of the seven light divisions and the FED to the remaining five divisions, including the National Guard's 29th Infantry Division in Virginia.

Briefcase Terminal

The BCT receives, processes, displays and transmits data required to perform Field Artillery functions, including nonnuclear fire planning, tactical fire control and meteorological and survey operations. The BCT is a militarized, lightweight, portable and intelligent communication and display terminal. It comes with four modems, allowing operations on multiple data nets.

Two BCTs will be at both the direct support battalion fire direction center (FDC) and the division artillery fire control element. A BCT will be at each division tactical and main fire support element (FSE).

FIST Digital Message Device

The FIST DMD is an improved version of the standard digital message device. It increases the digital net capability from one to four nets, provides a ground-vehicular laser locator designator (G/VLLD) interface, modifies all necessary tactical fire direction system (TACFIRE) message formats so units can fire Copperhead missions, does polar-to-grid conversions, calculates its own location and increases the number of buffers available for local active missions or messages to nine. A FIST DMD will be at each battalion and brigade FSE.

Efforts are under way to improve FIST DMD capabilities. The modified FIST DMD will include a graphics capability, printer interface, keyboard interface and expanded software with increased message formats.

Digital Communications Terminal

The DCT is a lightweight, hand-held communications message processor that provides a single-channel digital capability with point-to-point and netted communications over a variety of military radios. It can receive and transmit multiple messages.

The operator interface allows messages to be modified for automatic storage of specified messages. The message processor performs the tasks of message composition, editing, address coding, error control, checking and net protocol. The operator can specify message data rates, addresses of receiving agencies and keying times.

The DCT will be for all forward observers (FOs), FIST headquarters, combat observation lasing teams (COLTs), battalion and brigade fire support officers (FSOs) and Field Artillery battalion and division artillery commanders.

Forward Entry Device

The FED is a lightweight, hand-held terminal to compose, transmit, receive, edit, store and display messages to conduct and plan fire support. Units will employ it as a follow-on device to the DCT under the Army Command and Control System (ACCS) Common Hardware/Software Program. The operator can specify message data rates, addresses of receiving agencies and keying times.

The FED will be provided to all FOs, FIST headquarters, COLTs, battalion and brigade FSOs and Field Artillery battalion and division artillery commanders.

Three Control Modes

This equipment will provide light divisions a flexible system they can configure for most tactical situations. Manual and automated message routing options yield a wide variety of possible net and system configurations. Units can use three different control modes (centralized, decentralized and semicentralized) to provide responsive fire support and adequate control as dictated by the situation.

The following is an example of how a fire mission will be processed when a unit is operating in a centralized mode. An FO or FIST sends fire requests to the battalion FSE that checks for fire support coordination measure violations while simultaneously determining which fire support assets are available (battalion mortars or artillery). He then sends the fire requests to the maneuver battalion mortars, to the direct support battalion FDC or directly to a firing battery (if authorized by the battalion FDC). After receiving a fire request, the BCT at the direct support battalion FDC applies the commander's criteria for target engagement, selects a firing unit and transmits fire commands to the firing unit. The firing unit performs technical fire direction.

If light division units have questions, call the Training and Doctrine Command System Manager for Fire Support Command, Control and Communications (TSM—FSC^3) of the Field Artillery School at AUTOVON 639-6418 or commercial (405) 351-6418.

Cannon Artillery Powder Thermometer

There seems to be some confusion in the field as to which thermometer units should use to determine propellant temperature. We have a number of thermometers in the supply system, but ***only one*** correct model for the Field Artillery cannon systems: thermometer, powder temperature, M1A1; NSN 6685-00-344-4603; authorization: *Common Table of Allowances (CTA) 50-970* (Page 248). The Gunnery Department of the Field Artillery School has taken action to include this item in the additional authorization list (AAL) in all of the cannon system -10 technical manuals.

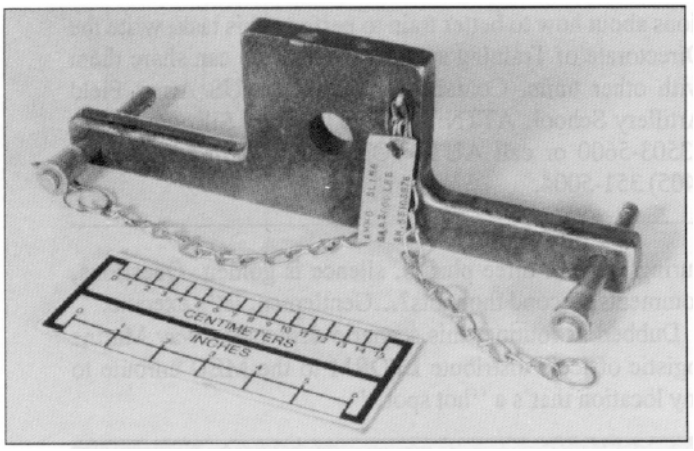
If units have questions, call the Weapons and Munitions Branch of the Gunnery Department, Field Artillery School, at AUTOVON 639-5523 or commercial (405) 351-5523.

BATTLEKING: Four "Field Fixes" Approved

The Training and Doctrine Command (TRADOC) Test and Experimentation Command Field Artillery Board (TEXCOM FABD) recently completed four evaluations with favorable results. Units can build all four field fixes locally.

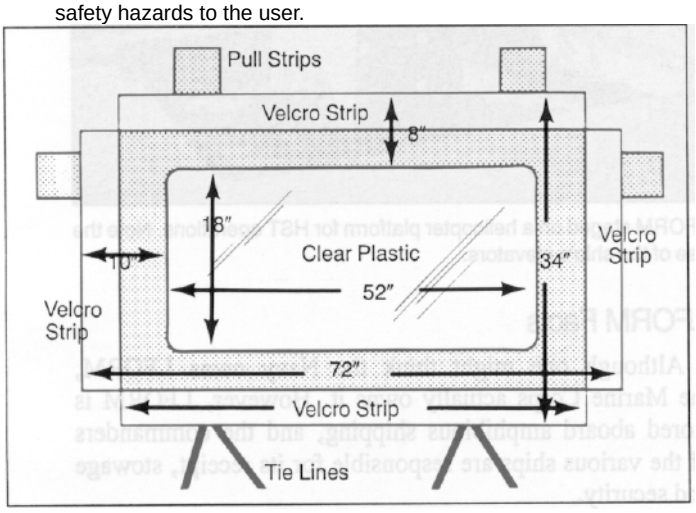
HMMWV Shelter

A shelter for the high-mobility, multipurpose wheeled vehicle (HMMWV) to use as a fire direction center (FDC) or battery operations center (BOC). Units can build this shelter for about $400.



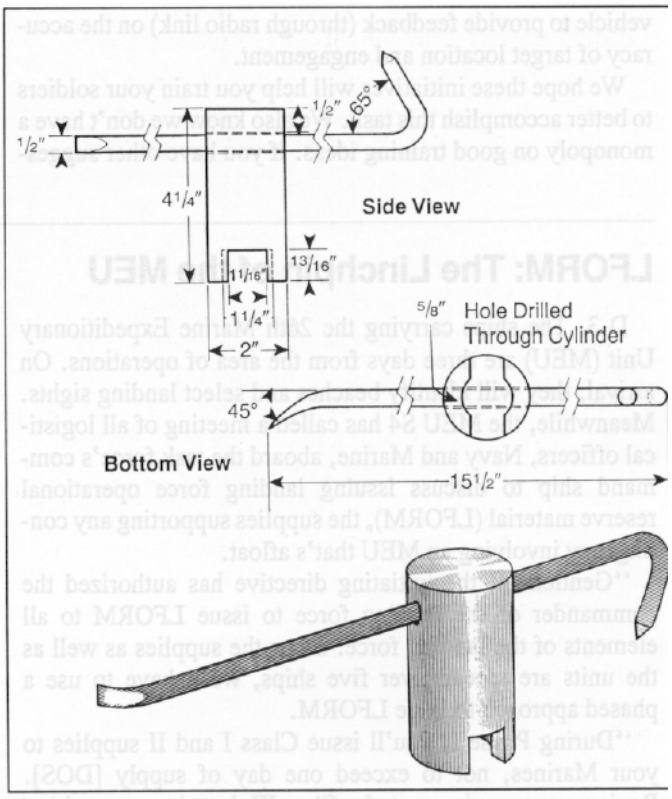
203-mm Projectile Sling

A sling to transload ammunition from the M977 heavy expanded-mobility tactical truck (HEMTT) into the M548 cargo carrier. Using the sling saves manpower and time and presents no safety hazards to the user.



Plastic Windows for Lance Missile Launchers

The plans for plastic side windows in the cab of the Lance launcher. Using plastic windows reduces the cost of replacing the window assemblies.



Powder Canister Wrench

The plans for a wrench for opening powder canisters. The wrench enhances safety and is made of non-sparking material.

Units wanting the plans for the HMMWV shelter or the projectile sling or additional information about these evaluations can write President, TEXCOM FABD, ATTN: ATCTFAO (BATTLEKING), Fort Sill, Oklahoma 73503-6100 or call Edgar T. Gunn or Sergeant First Class Lyndell A. Taylor at AUTOVON 639-3717 or 4075 or commercial (405) 351-3717 or 4075.

Attacking a Moving Target

Many field commanders and National Training Center trendline analyses have identified a problem with soldiers' opportunities to attack moving targets. To help reduce this problem, the Field Artillery School has done the following.

We added a training and evaluation outline (T&EO) to the fire support Army training and evaluation program (ARTEP) mission training plan (MTP). The T&EO contains specific information about how to attack a moving target array and addresses engaging both types of targets: preplanned and targets of opportunity. The MTP was published as a coordinating draft in June 1988 and will be published in final form early this fall.

Training for this task involves using white phosphorous (WP) or some other marking round to replicate the moving target array in existing Field Artillery impact areas. Having established the T&EO, we have justification for and are staffing a change to WP authorizations outlined in *Department of the Army (DA) Pamphlet 350-38 Standards in Weapons Training.* The moving target array is depicted by firing successive WP rounds into the impact area along the intended direction of travel and at appropriate intervals to represent the desired target speed. The WP rounds will be authorized for 105-mm and 155-mm cannon units only. (Since this task usually is executed by direct support units, we made no authorization for 105-mm or 155-mm units to provide WP support for 203-mm units.) We expect these changes to appear in the 1989 version of DA Pam 350-38.

An alternative method of training soldiers to accomplish this task is to use a vehicle-mounted position and azimuth determining system (PADS) to depict the array. Observers and fire direction centers then train either in a local training area or general defense plan (GDP) area using the PADS

vehicle to provide feedback (through radio link) on the accuracy of target location and engagement.

We hope these initiatives will help you train your soldiers to better accomplish this task. We also know we don't have a monopoly on good training ideas. If you have other suggestions about how to better train to perform this task, write the Directorate of Training and Doctrine so we can share them with other units. Contact: Commandant, US Army Field Artillery School, ATTN: ATSF-DTD, Fort Sill, Oklahoma 73503-5600 or call AUTOVON 639-5004 or commercial (405) 351-5004.

LFORM: The Linchpin of the MEU

D-3. The ships carrying the 26th Marine Expeditionary Unit (MEU) are three days from the area of operations. On arrival, they will identify beaches and select landing sights. Meanwhile, the MEU S4 has called a meeting of all logistical officers, Navy and Marine, aboard the task force's command ship to discuss issuing landing force operational reserve material (LFORM), the supplies supporting any contingency involving an MEU that's afloat.

"Gentlemen, the initiating directive has authorized the commander of the landing force to issue LFORM to all elements of the landing force. Since the supplies as well as the units are spread over five ships, we'll have to use a phased approach to issue LFORM.

"During Phase I, you'll issue Class I and II supplies to your Marines, not to exceed one day of supply [DOS]. Review your requirements for Class III, but since everything was 'topped off' before loading, you should have no immediate fuel requirement. Class IV will be issued on request after we've established a secure beach.

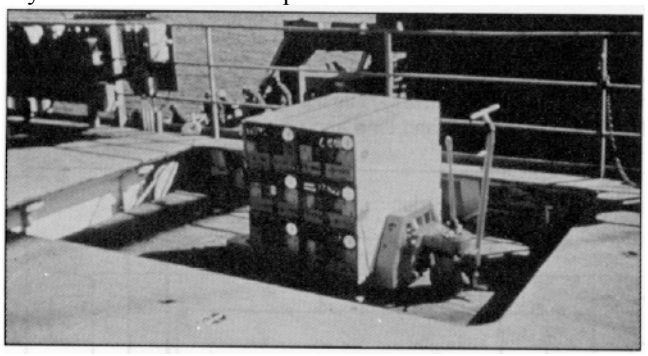
"At 0900 bells, helicopter support team [HST] operations will begin. The priority for the delivery of ammunition is as follows: one day of ammunition [DOA] plus the basic allowance [BA] per table of organization [T/O], based on today's morning report, and the same per crew-served weapon, based on your table of equipment [T/E]. Once we've issued small-arms ammunition, we'll concentrate on delivering the artillery battery's and tank platoon's ammunition to the appropriate ships. Shore party teams will coordinate the issue of ammunition during helicopter support team operations. Once in receipt, spread-load ammunition and provide security as per your standing operating procedures.

"During Phase II (D-2), we'll compile floating dumps and prestaged helicopter emergency supplies. Floating dumps will consist of one day of supply of Classes I, III (ground) and V (ground). Prestaged emergency supplies will consist of DOA, Classes I and V (ground). Check the operation of and pull preventive maintenance on your equipment as required. During Phase III (D-1), you'll issue the troops all their supplies for one day and rehearse the landing plan.

"During Phase IV (D-Day), we'll land the force. Throughout this phase, channel all requests for resupply and emergency resupply through your shore-party teams. As soon as the situation allows, we'll establish a beach support area with the remainder of LFORM at the appropriate supply dumps.

"Logistics situation reports will be required at the end of each phase, except Phase IV. Unless there's a problem during the first three phases, silence is golden. Questions, comments, second thoughts?...Gentlemen, let's execute."

Dubbed as routine, this scenario depicts the way Marine logistic officers distribute LFORM to the MEU enroute to any location that's a "hot spot."



LFORM staged on a helicopter platform for HST operations. Note the use of the ship's elevators.

LFORM Facts

Although one might think the Navy owns LFORM, the Marine Corps actually owns it. However, LFORM is stored aboard amphibious shipping, and the commanders of the various ships are responsible for its receipt, stowage and security.

The LFORM is released for issue by the Commanding General, Fleet Marine Force, Atlantic/Pacific. When contingencies develop, he directs the MEU commander to "break boxes." LFORM is part of the prepositioned war reserve materiel stocks (PWRMS), and like all PWRMS, it must be rotated according to its shelf life (i.e., prepackaged rations are inspected every six months and rotated every three years).

The LFORM contains 15 days of the following supplies: prepackaged rations (Class I), petroleum, oil and lubricants (Class III-ground), fortification materials (Class IV) and ammunition (Class V-ground). We compute specific quantities

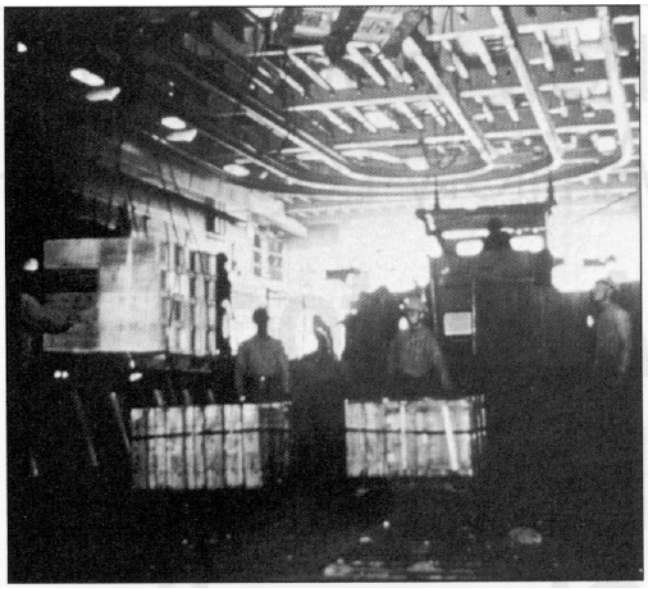
Assault Amphibious Ship—the Command Ship of the MEU

of supplies from the MEU's T/O, T/E, table of authorized materiel (TAM) and Class-V supply publications. For example, Class-V requirements are based on the T/O; the applicable equipment density, according to the T/E; and the estimated assault-intense rate of fire, as provided by the Class-V supply publications (i.e., an artillery battery's projectile mix for 15 days is 7,016 rounds). Although oversimplified, that's basically how Marines determine LFORM quantities.

Conclusion

While LFORM's purpose is two-fold—to reduce loading time during a crisis and minimize emergency requisitions—it's designed to support a forward-deployed MEU through the initial stages of combat. After the initial stages—about D + 15—follow-on shipping with 45 days of supplies and additional units should arrive.

The MEU's success depends not only on its will to win, but also on its ability to deploy rapidly and sustain itself on foreign soil. The linchpin to the MEU's success is LFORM.



The "break out" of LFORM in the well deck of an amphibious transport dock.

Ammo Log Day

Ammunition, the life blood of the Field Artillery— more specifically, ammunition resupply— was the topic of the Ammunition Logistics Day held recently at the Field Artillery School, Fort Sill, Oklahoma. More than 70 representatives of various agencies attended this conference on ammunition logistics and the problems associated with moving the volume and variety of munitions through the supply system to the user. Representatives of the Field Artillery and Ordnance and Transportation Corps, as well as logisticians, materiel developers and members of civilian industry, met to lay out the Field Artillery's ammunition requirements and propose solutions to the problem of supplying such large volumes of rounds. The agenda focused on requirements generated by current capabilities and those necessary for Field Artillery to support AirLand Battle doctrine.

In his opening remarks, Major General Raphael J. Hallada, Commandant of the US Army Field Artillery School (USAFAS), stressed the need for ammunition resupply doctrine and equipment capable of supporting the Field Artillery from now to beyond the year 2000. Lieutenant General William G. T. Tuttle, Jr., Commander of the US Army Logistics Center and Fort Lee, Virginia, offered the support and assistance of his agency to the on-going efforts in the areas of ammunition resupply.

The need for this forum becomes more evident as we progress toward the 21st century and the more technologically involved battlefield becomes a reality. Emerging technology in munitions and delivery systems dictates a resupply system that keeps pace with systems, offering increased rates of fire, enhanced mobility and autonomous operations.

The series of briefings included current and future Field Artillery ammunition requirements by USAFAS and the maneuver-oriented ammunition distribution system

A heavy expanded-mobility tactical truck (HEMTT) fords a stream carrying ammunition.

(MOADS) and palletized loading system (PLS) by the US Army Ordnance, Missile and Munitions Center and School, Redstone Arsenal, Alabama. The project manager for ammunition logistics briefed the group on the goals of the Ammunition Logistics Improvement Program: to improve the sustainability of the Field Artillery battlefield rearm and resupply and ammunition information transfer and to eliminate materiel deficiencies in ammunition resupply. The FMC Corporation, General Motors Defense Corporation, PACCAR, BMY, Martin Marietta and General Electric presented proprietary briefings on industry's on-going efforts to improve ammunition handling and resupply.

As a result of the briefings and discussions, a number of issues were assigned to various agencies to analyze and make recommendations in the areas of packaging, handling and distribution. The conference closed with the participants' recommmending a similar conference be held again in the future.

How to Win with Artillery Logistics —

A Platoon Leader's Observations

by Second Lieutenant Ronald R. Haddock

During **Certain Challenge** return of forces to Germany (REFORGER) 88, the 6th Battalion, 41st Field Artillery, 3d Infantry Division, West Germany, tried some new methods of providing Class V support in a tactical environment. Experiences at the battalion's maneuver rights area and during the live-fire Army training and evaluation program (ARTEP) in July 1988 showed we needed to expand the ammunition resupply doctrine found in *FM 6-50 Field Artillery Cannon Battery* (dated March 1983).

Specific issues our forwardly deployed battalion focused on during REFORGER included tactical positioning and command and control of the ammunition platoon and coordination among the S3, S4 and ammunition officer. The mission given to the ammunition platoon leader was simple—provide all Class V support for the battalion.

During the exercise, we relearned old lessons, and new issues emerged. For the ammunition platoon, REFORGER served as a testing ground for evaluating Class V resupply procedures and developing more streamlined methods for accomplishing the mission.

In FM 6-50, resupply simply consists of dispatching heavy expanded-mobility tactical trucks (HEMTTs) from the firing batteries and service battery for ammunition pickups at a division-level ammunition supply point (ASP). The HEMTTs then return to the battery trains areas to complete the resupply.

Our experience taught us that ammunition resupply is just not that simple. The demands of the European battlefield require us to be more flexible and more dispersed. *TC 6-50 Field Artillery Cannon Battery,* which was published shortly after REFORGER (29 September 1988), expands on the earlier doctrine. TC 6-50 describes a truck transfer point that's a coordination point for resupply operations. This is a modification of the single-loop method of resupply found in FM 6-50. One of the methods of resupply that our platoon found very successful closely parallels this new doctrine.

Tactical Positioning

What TC 6-50 calls a truck transfer point is known in the 6th Battalion as the ammunition holding area (AHA). Of the three positioning techniques we tried, the AHA was the best. The key point is that the ammunition platoon has to operate in an area separate from the battalion trains. From this location, the ammunition officer can best coordinate Class V resupply.

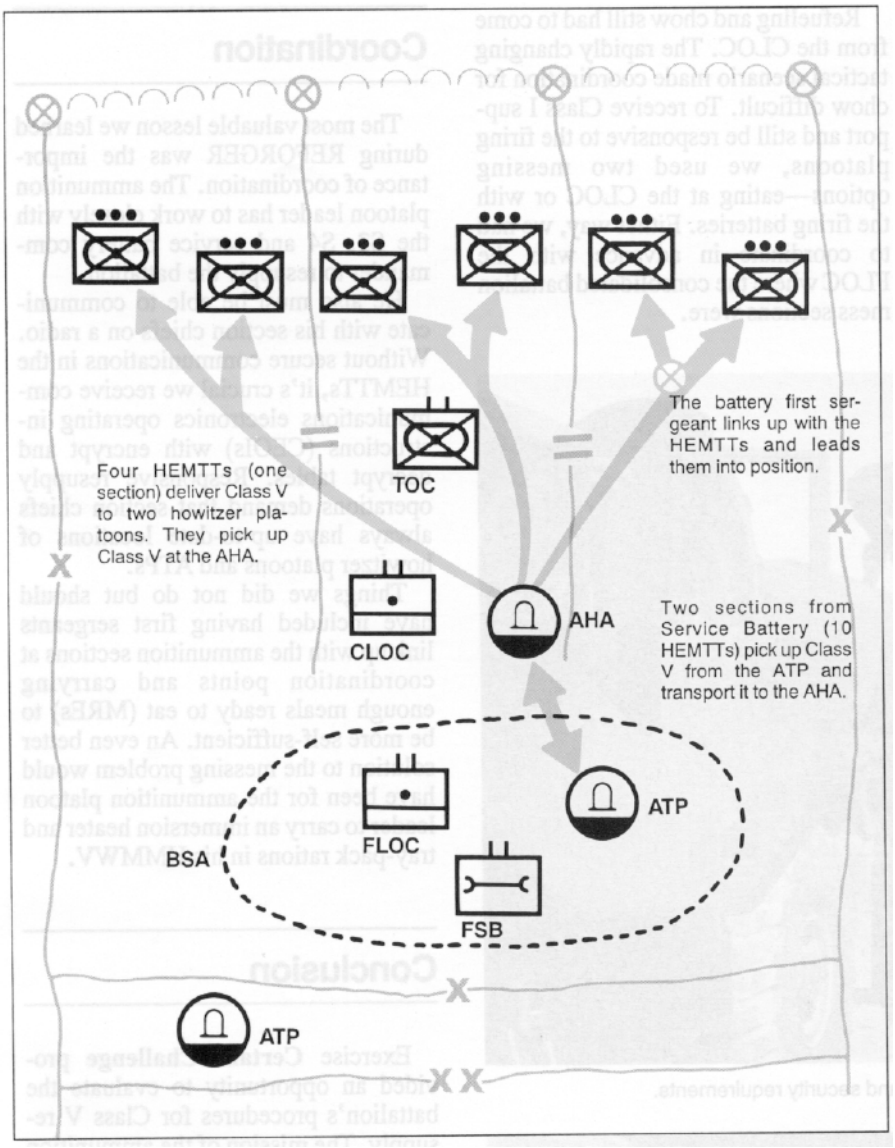
Ammunition Platoon

Our platoon is consolidated at battalion level under the battalion ammunition officer. We have 35 soldiers, 22 HEMTTs and one high-mobility multipurpose wheeled vehicle (HMMWV). The platoon has five sections: three firing battery sections, each with four vehicles, and two service battery sections, each with five vehicles. Equipment for a firing battery section includes one tow bar and three AN/GRC-160 radios. The service battery sections each have two tow bars and three AN/GRC-160s. Each section is outfitted with an M60 machinegun. Eighteen of the platoon's 22 HEMTTs have self-recovery winches. The platoon leader has a HMMWV with an AN/VRC-46 radio. His driver is equipped with a set of AN/TVS-5 night-vision goggles.

Positioning

Command and control of the platoon is primarily the responsibility of the ammunition platoon leader. Armed with a radio, a vehicle and a map, he must position the ammunition sections on the battlefield where they can rapidly resupply six firing platoons. Terrain for positioning the ammunition sections is coordinated with the S3.

In addition to resupplying the howitzer platoons, the platoon also picks up



Ammunition Resupply in the Brigade Sector

ammunition from ammunition transfer points (ATPs) run by the forward support battalion (FSB) in the brigade support area (BSA). The five ammunition sections in essence perform two separate missions concurrently. The three firing battery sections, with four HEMTTs each, resupply the six howitzer platoons. The two service battery sections pick up ammunition from ATPs.

During REFORGER, only three of the five sections actually participated in the resupply operations. Maneuver damage considerations and safety restrictions precluded all five sections from participating. The three sections involved performed both the rearm and ATP pickup missions.

Collocation With FLOC. In the first week of REFORGER, the ammunition platoon was collocated with the field logistics operating center (FLOC). The FLOC provided all Class I, Class III, Class IX and security requirements. The bulk of the battalion's maintenance assets, including a HEMTT wrecker, provided responsive maintenance support when a vehicle went down.

In the FLOC, an AN/VRC-46 radio with an OE-254 antenna provided communications with the combat logistics operation center (CLOC). The tactical operations center (TOC) usually was too far from the FLOC to establish good communications.

The major drawback of being collocated with the FLOC was the travel distance to the howitzer platoons. At one point during the rapid-paced REFORGER battle, the distance from the FLOC to the howitzer platoons was 75 kilometers. At this distance, the travel time over secondary roads averaged 90 minutes. This usually meant the HEMTTs departing the FLOC on a resupply mission arrived at the gun positions after the guns already had moved.

With the sections' having only AN/GRC-160 radios, all further coordination for resupply had to be done by the ammunition platoon leader. The result was the ammunition sections were not responsive enough to meet the needs of the firing platoons.

Collocation With CLOC. The ammunition platoon was collocated with the CLOC on the second week. Like the FLOC, the CLOC also was able to provide Class I and Class III support.

However, maintenance support was more limited. The smaller "slice" of maintenance assets included a 5-ton wrecker and a maintenance team. This is where the self-recovery winches and tow bars in each ammunition section were able to supplement the maintenance team when recovery was necessary. Class IX repair parts came from the service battery prescribed load list (PLL) trailer located in the FLOC. As in the FLOC, the ammunition platoon provided its own security elements as part of the collective security force.

The communications capabilities of the CLOC allowed the ammunition platoon leader to coordinate directly with the TOC to resupply the firing platoons. Additionally, indirect coordination with the forward support battalion for ATP pickups was through the service battery commander. He was in the FLOC and attended a daily meeting in the BSA. With the ability to communicate directly with the howitzer platoons as well as get up-to-date information on ATP locations, the CLOC was an excellent location for the ammunition platoon.

The only drawback of being in the CLOC was that the addition of the ammunition platoon made the CLOC more difficult to position and conceal. This led to our creating the AHA.

Creation of AHA. The AHA consisted solely of the ammunition platoon. The site chosen for the AHA was a woodline within a few kilometers of the CLOC. The primary considerations in site selection were its proximity to the howitzer platoons and the ability of existing terrain to rapidly conceal the platoon.

The AHA served as a short resting area where section chiefs received instructions from the ammunition platoon

leader for resupply operations. The AHA was where we reconfigured vehicle loads to deliver specified "push packages" to the firing platoons. The HEMTTs from the firing batteries and the service battery sections both came to this location.

The AHA had the advantage of being small and easy to move. However, it provided only limited recovery using organic winches and tow bars.

Refueling and chow still had to come from the CLOC. The rapidly changing tactical scenario made coordination for chow difficult. To receive Class I support and still be responsive to the firing platoons, we used two messing options—eating at the CLOC or with the firing batteries. Either way, we had to coordinate in advance with the FLOC where the consolidated battalion mess sections were.

The FLOC provides all Class III, Class I, Class IX and security requirements.

An Ammunition Section from the 6-41 FA's Ammunition Platoon practices uploading ammunition during REFORGER.

Coordination

The most valuable lesson we learned during REFORGER was the importance of coordination. The ammunition platoon leader has to work closely with the S3, S4 and service battery commander to resupply the battalion.

He also must be able to communicate with his section chiefs on a radio. Without secure communications in the HEMTTs, it's crucial we receive communications electronics operating instructions (CEOIs) with encrypt and decrypt tables. Responsive resupply operations demand that section chiefs always have up-to-date locations of howitzer platoons and ATPs.

Things we did not do but should have included having first sergeants link up with the ammunition sections at coordination points and carrying enough meals ready to eat (MREs) to be more self-sufficient. An even better solution to the messing problem would have been for the ammunition platoon leader to carry an immersion heater and tray-pack rations in his HMMWV.

Conclusion

Exercise **Certain Challenge** provided an opportunity to evaluate the battalion's procedures for Class V resupply. The mission of the ammunition platoon was fairly realistic, even though the battalion didn't fire live artillery. Integrating Class V resupply with the tactical scenario exercised the tactical-logistical coordination system and was excellent training for the ammunition platoon of the 6th Battalion, 41st Field Artillery.

Second Lieutenant Ronald R. Haddock is a fire direction officer in A Battery, 6th Battalion, 41st Field Artillery, 3d Infantry Division, West Germany. During REFORGER 88, he was the Ammunition Platoon Leader for the Battalion in direct support of the 2d Armored Brigade, 3d Infantry Division. Second Lieutenant Haddock is a 1987 graduate of the US Military Academy at West Point.

NTC

Part I

Top-Down Fire Planning

by Lieutenant Colonel Robert D. Sander

This article begins a three-part series on fire support at the NTC. Part II will cover how to execute top-down fire planning. Also in Part II, we'll have an article on translating the maneuver commander's intent into the fire support annex so Redlegs can conceptualize the commitment of combat power during the battle. Part III will cover the "nitty-gritty" of tactical fire direction and rehearsals. Though the authors' opinions may vary somewhat, all are experienced fire supporters with rotations at the NTC, or they have served on the NTC staff.

Since the National Training Center (NTC), Fort Irwin, California, has been in operation, our ability to plan and execute fire support has been under constant scrutiny. In most cases, there's room for improvement.

The plan must support the scheme of maneuver, comply with the commander's intent, be practical and be completed at each level in a timely manner to preserve preparation time for subordinates. A simple plan, completed in detail and understood by all, has the best chance for success. A complex plan with excessive targets has a high chance of failure.

Whether intended or not, what most fire support planners attempt to do is to wait until the maneuver plan is complete and then produce a fire support plan to complement the maneuver scheme and cover every possible contingency. We wait for plans to originate at the company level, consolidate it and resolve duplications at the task-force level. We then repeat the process at the brigade level. We pass a massive plan to the direct support (DS) battalion that fails to focus on the essential elements of the mission. Typically, maneuver crosses the line of departure or the opposing force attacks before we complete or rehearse our plan. This scenario of sequential fire planning and its associated problems provides the stimulus for top-down fire planning.

The Concept

The concept of top-down fire planning is simple. Planning originates at the higher levels and is performed under the supervision of the most experienced fire support planner in the force. The plan, in its completed form, has a limited number of Field Artillery targets—45 to 60 at the most.

The brigade fire support annex contains only those targets the fire support coordinator (FSCOORD) thinks are essential to support the brigade commander's intent. The remaining targets are allocated to the task forces, in accordance with priorities for Field Artillery support. The task-force commander allocates targets to support his plans and allocates Field Artillery and mortar targets to his companies.

By limiting the number of targets in the total plan, we narrow the scope of our planning activities so we can increase the level of detail and concentrate on the brigade commander's objectives. But are we willing to accept the risks associated with this narrower field of view? The task force and company or team receive targets assigned by brigade as missions with stated and implied tasks to assign observers and conduct the calls for fire.

The purpose of top-down fire planning is not to provide a short cut in the planning process. It's a technique for accomplishing what doctrine has always dictated—developing a plan for fire support that supports the intent of the maneuver commander concurrent with preparation of the maneuver plan.

Brigade Planning

It's at the brigade level that top-down fire planning begins in earnest.

The brigade commander, assisted by the FSCOORD, must establish clear fire support priorities. The brigade staff has the guidance provided by the division operations order, knows how many and what type of fire support assets are available, can access division intelligence information and is on hand to receive the commander's intent and guidance. Once the target overlay is complete, it should be a graphic expression of the brigade commander's intent for fire support.

Fire Support Annex. The Annex is only the first part of the fire support plan. At the least, it has a target list and overlay, an execution matrix, a statement of the commander's intent for fire support, an allocation of targets for planning, the planning cut-off time and rehearsal instructions.

Planning for each target must be detailed, as each target results in a specific mission for a subordinate element to position observers and firing batteries or platoons. The questions of who, what, when, where and how must be considered as we plot each target. *Who*—which task force or supporting unit will observe the target area and initiate the call for fire? Which unit will fire on the target? *What* is the nature of the target expected to be, the decision point and the volume of fire needed to achieve the required effects? *When* is it expected that we'll fire on this target? *Where* must observers and delivery units be to complete the mission? *How* will we initiate or trigger the call for fire and over which net will we transmit it?

Through such focused planning, we expect to fire fewer missions with greater results. And, these are the missions that support the brigade commander's intent.

While the plan is not complete until task-force and company commanders complete their planning and firing elements complete preparations, the fire support annex has enough information for task forces to start their planning. This puts the concept of concurrent planning in motion.

Should the enemy attack earlier than expected or the time to cross the line of departure is amended to an earlier time, at least a portion of the plan is in the hands of the DS battalion. We add the task-force fire support plans to the brigade plan as the task-force plan is conceived, coordinated and approved.

Intelligence. The dependence on intelligence information and the intelligence preparation of the battlefield (IPB) is critical. The DS battalion S2 and brigade fire support officer (FSO) must work with the brigade S2 to ensure a unity of effort and that all understand the intelligence requirements and collection, reconnaissance, counter-reconnaissance and counterfire plans.

The Field Artillery battalion S2 is the link between the brigade planners and the counterfire target acquisition system. Based on the concept of operations and intelligence information, informed decisions must be made on Firefinder radar priority zones, critical friendly areas, censor zones and artillery target intelligence (ATI) needs.

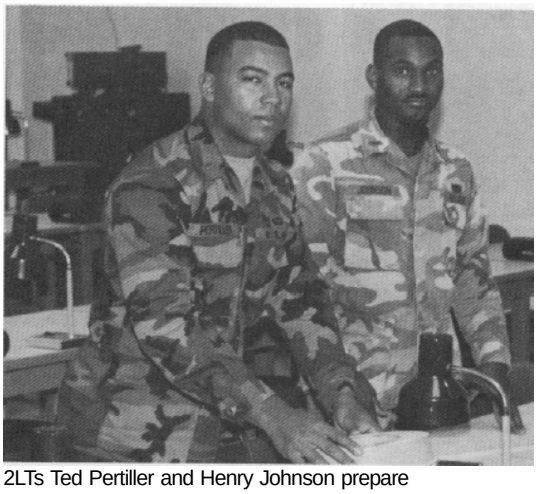
A number of critical subsidiary issues and corresponding decisions can arise during this phase of planning.

- How deep into the enemy sector will the collection effort extend, and to what depth does the brigade commander intend to attack targets with fire support assets? The answers to these questions are vital in planning Field Artillery positions, communications and logistics.

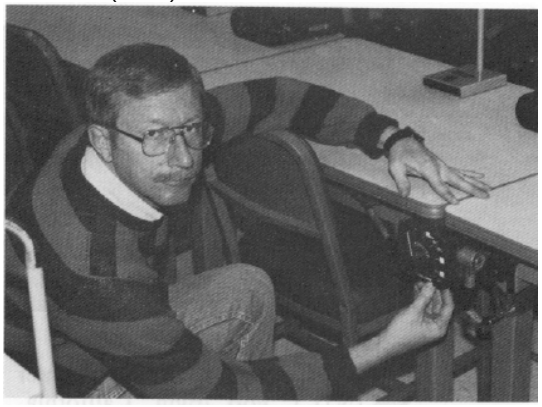
If a decision can be made as to the depth Field Artillery fires are required, we can position batteries to take advantage of their range capabilities and reduce the number of times they need to displace. Limiting unnecessary movement keeps the maximum number of tubes available to fire, minimizes logistical requirements and provides more opportunities to improve firing positions.

War-gaming battery or platoon movements is an essential element of planning. The FSCOORD and his S3 must have an idea of which batteries will be available at any given time to avoid either over-or under-committing fire support. The DS battalion S3 needs this information well in advance so he can complete his planning and coordinate battery positions and movements.

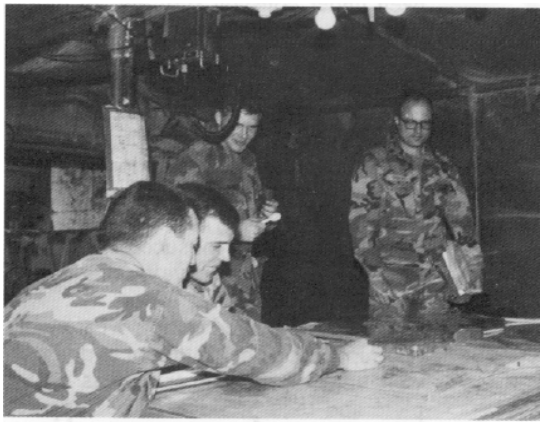
- Fire support is vulnerable to electronic warfare. Jammers can "turn off" the Field Artillery. We must consider anti-jamming procedures, radio planning ranges and line of sight. The scouts must know if they'll relay calls for fires through the task-force fire support element (FSE) or contact the fire direction center (FDC) directly. The plan could include positioning forward observers (FOs) with the scouts at the



2LTs Ted Pertiller and Henry Johnson prepare map resection instruction in the training set, fire observation (TSFO) classroom.



1LT Tim Geominne, USAR, a TSFO Operator, checks communications wiring installed in the classroom.



Left to Right: SSG Davis (NBC NCO) and CPT Hull (S3) plan the scenario during C/4-5 FA's battery evaluation.

expense of degrading dedicated fire support and reducing the number of radios available to the balance of the task force.

The bottom line is that the fire support plan establishes communications requirements—these requirements must be part of the plan. The tactical standing operating procedures (TSOPs) should establish the communications architecture, based on the communications equipment on hand. But we must review and consider for each plan the number of radios actually operational and the specific requirements of each operation.

● Including the Field Artillery battalion S3 in the initial planning session is essential. This is when he gets the information to write his warning order and Field Artillery support plan and receives his initial guidance from the FSCOORD. He helps the brigade FSO in fire planning. Being knowledgeable of the plan and commander's intent, he can convey plans accurately and direct battalion FDC preparations.

Quality Control. We must have quality control in transmitting fire plans. Once we transmit a fire plan through the digital communications system, corrections are time-consuming. In addition, there's always the lingering doubt as to whether or not implementing units received or understood the corrections.

Target numbers, grid locations and descriptions should be typed into the varible-format message entry device (VFMED) and reviewed for accuracy before their transmission. It's common to have typographical errors in target numbers or locations. One solution is to have a senior supervisor check the data as it appears on the VFMED screen before its transmission and compare it target by target against the target overlay for accuracy.

We should require voice acknowledgements for every digitally transmitted fire plan. The Field Artillery support plan must be briefed to battery commanders, and they should in turn back-brief the battalion commander, once they've completed their planning.

We should give the same level of attention to producing fire support overlays. We need precise overlays. Machine reproductions are notorious for distortion. We should carefully plot targets using a map protracter and fine-point marker. Target numbers must be legible. It's the target overlay, not the target list, the FO or company FSO ultimately use.

The facilities and capabilities to produce acetate overlays is limited at each successively lower level of command. To ensure accuracy and reduce time subordinates need to prepare plans, the brigade FSE should provide at least one acetate overlay to each task-force FSE and the DS battalion.

At the task-force level, the targeting process continues. A task force posts additions and changes and transmits them back to the brigade FSE, using the same quality control measures. It makes at least one set of high-quality acetate overlays for each company and the scouts. Concurrently, the brigade reviews and approves task-force targets and passes them to the DS battalion and reinforcing Field Artillery.

Proportional Planning. Which headquarters plans targets on any portion of the battlefield depends on the situation. The ratio of brigade versus task-force planned targets should be proportional to the maneuver detail included in the brigade operations order.

If the order leaves a great deal of latitude to the task forces, then it follows that they plan the preponderance of targets to ensure synchronization. Conversely, if the brigade order includes more specific maneuver guidance, then the brigade plans a larger portion of the targets.

It's important to remember that we're discussing only the ***formal*** portion of the plan and that one of the overall objectives is to maintain the total number of targets at a manageable level of 45 to 60 targets. It doesn't eliminate targets of opportunity and quick-fire plans. Priorities of fires will continue to be a command decision.

Other considerations. The brigade must consider other issues during planning.

● Intelligence drives targeting. If the enemy situation is vague, the "right answer" is probably fewer, not more targets, and more emphasis on priority intelligence requirements (PIR), IPB and collection efforts.

● Brigade should do the initial target planning for covering brigade-directed obstacles, engagement areas, known enemy locations that can affect the course of the battle and avenues of approach. Once the target overlay is complete, we should be able to lay it down over the engineer, intelligence and operations overlays and, armed with the commander's intent, deduce logically the reason for each target. We should periodically stack the overlays for review as we refine each of these products and determine the locations of obstacles we've completed.

● Task-force FSOs work for the task-force commander—not the brigade FSO or FSCOORD. Task-force commanders, not FSOs, execute the brigade-planned targets in their areas of responsibility.

The planning process continues at the brigade well after it publishes the fire support annex. Continual coordination with the S2 ensures the most current intelligence is the basis for targeting. The brigade continually monitors the degree of completion and location of engineer obstacles and adjusts fire plans as necessary. The task force starts planning once it receives the order.

Task-Force Planning

Concurrent with receipt of the brigade operations order, the task force receives the brigade fire support annex. It includes a target overlay, target list, execution matrix, statement of the commander's intent and an allocation of targets for planning.

Limited Targets. As stated earlier, it must limit the number of targets a DS battalion can efficiently handle (45 to 60). If a brigade identifies 30 targets in the initial part of the plan (the fire support annex), a total of no more than 30 are available for distribution to the rest of the brigade. In this case, the priority task force may receive a planning allocation of no more than 10 to 15 additional Field Artillery targets.

This appears to be only a fraction of the targets we'd like to plan for. But consider the number of targets a DS battalion can fire during a one-hour period, based on following assumptions—

1. The DS battalion is supporting a heavy brigade defending against a Soviet motorized rifle division.

2. To achieve the effects desired, we plan to mass the battalion.

3. We need a minimum of three battalion volleys of dual-purpose improved conventional munitions (DPICM) to achieve the effects on the enemy maneuver forces.

4. We won't exceed the sustained rate of fire.

With these assumptions, the maximum number of targets the DS battalion can fire in one hour is 20 and, realistically, only in a schedule of fires. Considering time for communications, computations, tactical fire direction and, in a worse case, movement of batteries, the number comes out considerably less than 20.

Assumptions 2, 3 and 4 aren't "rules," and one could argue for implementing alternatives. But the point is we can't "light up" grid squares, and commanders deserve an accurate assessment of the Field Artillery support they can expect. The number of targets allocated to the task force is based on a ceiling established by our limitations, the priority of the task force and a realistic expectation of ammunition supply constraints.

Refinement. Task-force commanders, assisted by their FSOs, refine brigade-planned targets in their sectors. In most cases, the target locations will be determined by intelligence reports supplemented by brigade situational templating and map inspection. If the task force can conduct an air or ground reconnaissance, it may be able to determine a more accurate grid to target.

If the difference between the two grids is significant, the task force will have to refine the information. To avoid confusion, it should delete the old target and add the new target at the adjusted location using a new target number. The task force must coordinate these refinements and establish a system to ensure all FDCs and FSOs receive them.

The task force assigns primary and back-up observation and call for fire responsibilities to the companies. If a target planned by the brigade and its associated trigger can't be observed, the task force should plan a new target meeting the brigade commander's intent and notify the brigade.

Mortar Plan. Fire planning for mortars is critical to the task force. A simple plan works best. Consider giving the mortar platoon a specific mission during each phase of the operation. The platoon could be dedicated to support a specific company or team or be designated as the primary indirect fire agency for specific targets in the task-force plan. In any case, the platoon's mission must be realistic and clearly understood both by the platoon and the observers who will be calling for mortar fires.

Fire Support Priorities. The task force plans its allocation of Field Artillery targets, refines assigned brigade targets as needed and, using the same process the brigade uses, plans fires for the mortar platoon. The task-force commanders, not fire direction officers (FDOs), establish fire support priorities. But these priorities must be clear.

Undisciplined calls for fire can saturate fire nets quickly and produce a queue of targets. When facing a mobile enemy, we must fire missions on time before we can be on target. As the tactical situation dictates, commanders change the priorities.

Informal Planning. The limitation on the number of targets included in the plan doesn't mean we simply quit firing once we reach this number. Company commanders and their FSOs should continue the informal planning.

The buffer group in the digital message device (DMD) can store targets, or planners can continue using such simple techniques as a terrain sketch. If the observer has the call for fire ready to send, the processing time in the DS battalion compares very favorably with that for preplanned targets.

Priority Task Force. Planning in the priority task force deserves special consideration. This is the task force that will "make" the main effort, and the success of the operation depends on its success.

This task force should receive priority in planning assistance and coordination. Either the FSCOORD or brigade FSO should go to the task-force tactical operations center (TOC) to help the task-force FSO. Going beyond assistance, a brigade planner should help conceive the task-force fire support plan and expedite understanding and coordination of the plan.

Left to Right: SGT Tom Tousley (Intelligence Analyst), 2LT Will Beauchim (BICC Officer) and SFC James Page (Intelligence Sergeant) discuss OPFOR situational templates.

During implementation, the FSCOORD and task-force FSOs will probably be positioned forward on the battlefield with their maneuver commanders. If this is the case, they'll have no digital communications capability. Therefore, we should execute Field Artillery fires by voice communications in the priority task force so the FSCOORD and all FSOs can monitor them.

Company or Team Planning

Formal planning at the company level begins with receipt of the task-force order. The order has the fire support annex, which includes brigade targets in the task-force sector, targets added by the task-force commander to support his plans and specific guidance for employing mortars.

Company Commander. He must position primary observers and establish secondary or back-up observers and trigger points for calls for fires. Key personnel must understand their priority for fires—in the task force, task-force priorities in the brigade and when and under what conditions priorities will change. They plan targets in accordance with the planning allocation provided in the task-force order. The task-force FSE provides a minimum of one high-quality acetate target overlay to each company, so it can begin planning immediately.

At first glance, the planning responsibilities at the company level might

appear to be slight. But, this isn't the case. It's at this point in the planning that the requirement for detail is most critical.

Company FSO. Helped by the target area survey, if necessary, the company FSO must ensure the grid to target and trigger point are visible to the observer or will be visible, given the expected conditions of smoke, night operations or position in the formation during offensive operations. Each observer must understand the communications plan as well as the back-up plan in case the primary observer is unable to complete the mission. All members of the fire support team—platoon leaders and key NCOs—must be drilled on all aspects of the plan.

Concurrent Planning

At this point, fire planning is in full operation with concurrent activities at the brigade, task-force and company levels. With 12 company headquarters, three task-force headquarters, the brigade headquarters and the DS battalion all involved in planning, it's essential we have a disciplined planning system.

We must coordinate changes and approve them before the planning cut-off time. We establish this cut-off time so delivery units can check their preparations and rehearse their plans.

Rehearsing

Operations at the NTC have "driven home" the value of rehearsals. This aspect of the plan is so vital that no tactical plan is complete until it's rehearsed.

Rehearsing fire support in isolation isn't the answer. It must be a combined-arms effort—therein is the challenge. Rehearsals must include members of the team from all over the brigade battlefield. At the same time, we're working under serious time constraints and can't, from a communications security and electronic warfare (EW) perspective, assume we can do it all by using radios.

Rehearsals Versus War Games. The fire planning process and the discipline and precision with which it's executed is directly linked to rehearsals. For the purposes of discussion, it's important to agree on the definitions of terms.

"Rehearsal" and "war game" are often used interchangeably but have different meanings. The *Webster's Dictionary* defines a rehearsal as "a private performance or practice session preparatory to a public appearance or a practice exercise." It defines war game as "a simulated battle or campaign to test military concepts, usually conducted in conferences by officers acting as the opposing staffs." Neither of these substitute for the FSOs' reviewing and consolidating fire plans from subordinate units and resolving duplications and errors or for FDOs' ensuring computations are correct.

Coached by NTC controllers during live-fire exercises, the rehearsals are effective, but we depend extensively on radios to check target data and coordinate fire support with the maneuver forces. This NTC practice has great training and safety value, but it could be tactically unsound in a high-threat EW environment.

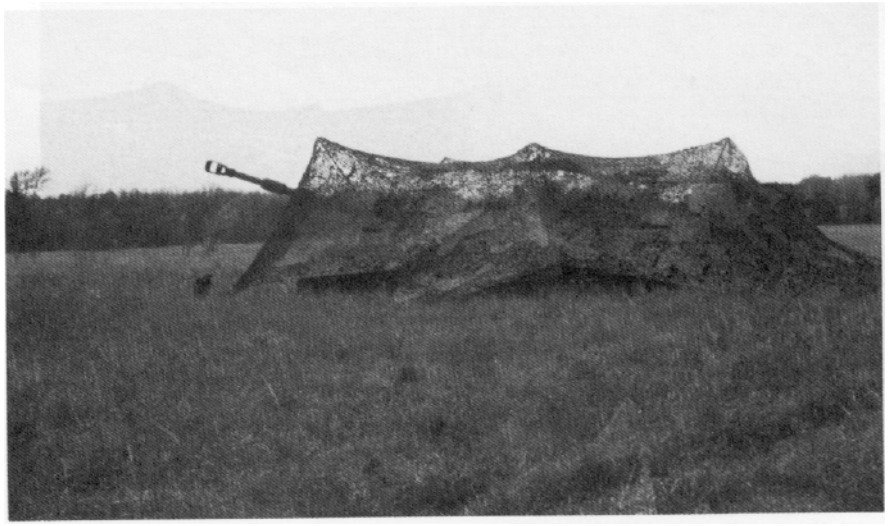
Also, this exercise focuses on only one task force. When multiple task forces are involved, the scope of the problem multiplies. We must include the FSOs and FOs, and as previously stated, they work for the maneuver commanders, not the DS battalion commander. If we rehearse fire support in isolation, we have no way of knowing if we're synchronizing the exercise.

The DS battalion supports the entire brigade. Getting the entire brigade on line for a radio rehearsal is a major effort and may not be possible when time is limited or we're operating in an EW environment.

The FSV in a reverse slope position using the hammerhead and periscope to observe fires.

War Games at Brigade. At the brigade level, war gaming involving all essential commanders and staff members of the combined-arms team, not rehearsals, becomes the most likely option. There may be exceptions if the exercise can be in an assembly area, or there's no EW threat.

A war-gaming technique that works is to have the S2 brief the expected enemy situation and courses of action and play the role of the opposing force (OPFOR) while commanders and S3s



The 7th Howitzer Section of B/4-5 FA

drill actions, counteractions and fire support engagements. The DS battalion S3 participates in this exercise. He confirms which firing units will attack each target, what the target numbers are and where they are, which targets are included in groups and series and when and where batteries move.

Task-Force War Games or Rehearsals. While the scope of the problem narrows at the task-force level, inclusion of the DS artillery S3 in the task-force war game or rehearsal becomes more difficult, depending on the number of task forces in the brigade. However if the brigade commander has designated a priority task force, including either the brigade FSO or S3 in the task-force rehearsal is vitally important to ensure fire support is completely coordinated.

CSM Dan Roberts and SPC Danny Burk compute data, using the automated range safety system (ARSS) developed by the Field Artillery School.

Company Rehearsals. Rehearsals appear to be more feasible at the company level, excluding actually transmitting fire missions to the DS battalion FDC. In concept, the maneuver company would rehearse after the task-force and (or) brigade war-gaming sessions while war gaming and final checks of technical data are being conducted with the DS battalion S3, FDO and battery commanders. Rehearsal and war-gaming instructions should be included in the operations order and the procedures fixed by SOP.

We shouldn't use rehearsals to purge target duplications and errors—that's the fire supporters' responsibility. If we're proficient in our fire planning procedures, we can eliminate many of the duplications and errors. If we depend on a radio rehearsal to detect errors, the process will be time-consuming and can compromise our radio nets and command post locations.

Allowing Time. Both war games and rehearsals should focus on synchronizing combined-arms actions and verifying that each unit understands its mission. In the past, sequential fire planning (and inevitably running out of time before the process is complete) has caused us to lose sight of our responsibility to assure the accuracy, dissemination and understanding of our fire plans. Top-down planning solves this problem and allows time for rehearsals.

Conclusion

The strength of top-down fire planning is it starts with the commander's concept of fire support (in terms of targets and indirect-fire engagements) and maintains this focus throughout the planning process. By devoting our planning time to those engagements the commander deems essential to his concept of the operation, we can plan fire support in detail. We also can coordinate with all members of the combined-arms team and rehearse as parts of the plan.

But the plan must be realistic. Experience tells us that if we overcommit our fire support assets in planning, the result is confusion and misdirected efforts in execution—we fail to provide the support our maneuver forces need.

The 7th Howitzer Section of B/4-5 FA firing.

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CPT Phil Evans

How to Train Your Battery Commanders

by Colonel Joseph P. Monko, Jr.

Training for prospective battery commanders should go beyond the collective and individual training conducted in a unit. It should be specific training that you, a battalion commander, arrange and conduct before and after an officer assumes command of one of your batteries. And it begins when you identify an officer as a likely candidate for command and continues throughout his command.

Some of the training may be on general subjects, but it also should cover subjects directly related to the command and operation of the unit. Although you might use outside schools and instructors from time to time, this training should be ***your*** program.

Beginning the Process

You usually have an idea of who future battery commanders might be. Generally speaking, those officers who are officer advanced course graduates and have not previously commanded will command in their second troop assignment. You should start the general training of these officers toward their eventual command when they first come to your battalion. Once you have decided an officer will take a particular battery, you can begin his specific training.

Battery-commander training falls in three categories: formal schools (both on and off post), local experts and your instruction.

Formal Schools

Formal schools are outstanding for training battery commanders, particularly before they assume command. When possible, pick courses offered locally. Most installations have courses such as nuclear, biological and chemical (NBC), supply, strategic deployment, etc. These courses usually teach "how to" with the added bonus of presenting local techniques and procedures.

But don't rule out formal off-post schools. If you can swing it, schools such as Airborne, Ranger, Air Assault, etc., will go a long way to prepare an officer for command. Although the Combined-Arms and Services Staff School (CAS^3), Fort Leavenworth, Kansas, is primarily designed to prepare officers to serve on staffs, the skills taught are invaluable to a commander. If at all possible, make CAS^3

The battalion commander's training program should cover some subjects directly related to the command and operation of the unit.

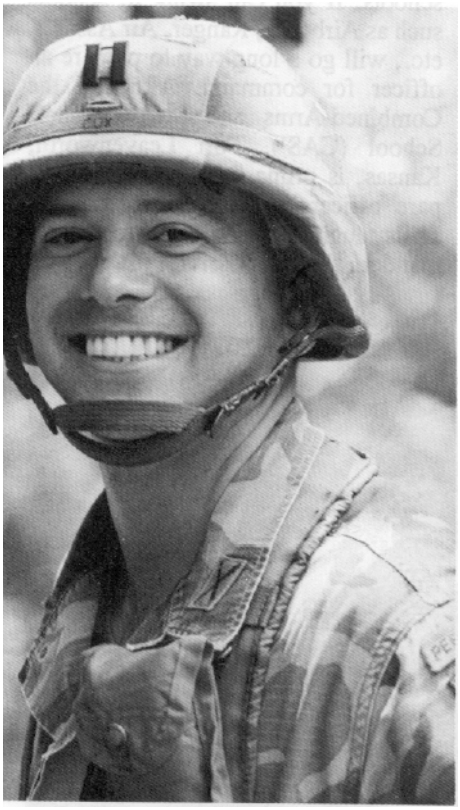
part of your battery-commander training program.

Local Experts

Training by local experts may stand alone or may be followed by your instruction. For example, instruction presented by Staff Judge Advocate (SJA) personnel on administrative alternatives to the Uniform Code of Military Justice (UCMJ) might be followed by your instruction on how you implement administrative alternatives in your battalion.

The Adjutant General, a physician's assistant, maintenance technicians, the S3, an education advisor and the command sergeant major are just a few of many local experts available to train your commanders. But tell them exactly what you want them to cover to keep training sessions from "rambling." Each session should be short—no more than an hour.

And to emphasize the importance you attach to this, you should be present at all local-expert sessions. Your presence will ensure you know what your prospective commanders are learning, that the instructor sticks to the subject and that everyone understands this is your personal program.



The battalion commander should arrange and conduct training for his battery commanders before and after they assume command.

Your Training

Finally, ***you*** must train your commanders—teach them how to take care of issues important to you. At the same time, you can impart your philosophy and set unit standards.

Never Ending the Process

You can continue the training by giving your commanders practical help after they take command. For example if the SJA has instructed them on administrative alternatives to UCMJ punishment, you can present a "how to" session on letters of reprimand. At the end of that session, you might tell your commanders, "When you think you want to write a letter of reprimand, get all your facts together and come see me."

Potential Battery Commander Training Subjects

- Supply Hand-Receipt Management
- Change-of-Command Inventory Procedures
- Artillery Safety—Training, Testing and Certification
- Administrative Alternatives to UCMJ Punishment (Several Training Sessions)
- Officer Efficiency Reports
- Enlisted Efficiency Reports
- How to Conduct Inspections
- Family Support Plans
- Training, Planning and Scheduling
- Field Training Exercise (FTX) Planning and Preparation
- Planning and Conducting Evaluations
- The Estimate of the Situation
- The Troop Leading Sequence
- How to Issue Tactical Orders
- Performance Counseling
- Discipline Counseling
- Officer and NCO Professional Development Planning and Training
- How to Process and Administer Article 15s
- Professional Development Counseling

When a subordinate commander does come to see you, walk him through the process step-by-step. This technique "plants" the new commander's feet firmly on the ground, in both theory and practice, on those subjects vital to the effective functioning of your command.

One word of caution: be careful, especially in the UCMJ area, not to give the appearance of predisposition or undue command influence. Allow the experts to present the legal alternatives; you teach commanders your general policy of implementing those alternatives.

Conclusion

The list of subjects for battery commander training are many. Each of you has to decide what subjects you want your battery commanders to learn. Initially, you can concentrate on those subjects that support your philosophy or the programs and standards you want. Then once you get your training program going, you can adjust it as necessary.

If you ever wonder why one of your commanders isn't doing something the way you want it done, then ask yourself, "What did I do to ensure he was trained on that subject?" If your answer is "not enough," then train him. After all, you're training the future senior leadership of the Field Artillery.

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Fragments

FROM COMRADES IN ARMS

Joint Strategic Deployment Training Center

The ability of the US to deter aggression, limit conflict or wage war successfully depends to a large extent on our ability to deploy rapidly and sustain fighting units. With potentially volatile situations occurring throughout the world, the need for an orderly and swift deployment of the services' forces and equipment can't be overemphasized. To ensure the forces can respond to national emergencies or execute contingency plans, units must plan, organize and conduct deployments.

The outgrowth of a study on strategic deployment training conducted by the US Army Transportation School, Fort Eustis, Virginia, was the provisional activation of the Joint Strategic Deployment Training Center on 1 October 1987 at Fort Eustis. The mission of the Center is to develop and present resident and nonresident deployment training to selected officers, civilians and NCOs charged with planning and executing operations plans (OPLANS). The focus ranges from planning simple unit tasks to detailed strategic movement.

Initially, two courses are being taught at the Center. The Air Deployment Planning Course (ADPC) and Surface Deployment Planning Course (SDPC) began in the first half of FY 89. A third course, the Strategic Deployment Planning Course, is tentatively scheduled to begin in the third quarter of FY 90 and will be two-weeks long.

Surface Deployment Planning Course

The SDPC is a two-week resident course designed in building-block fashion to train the unit movement officer (UMO) or NCOs to plan the move from the home station to the port of embarkation and from the port of debarkation to the marshalling area in the theater of operations. With emphasis on planning, coordinating and executing unit movement plans, the course is built around four annexes: movement planning, continental US (CONUS) highway operations, rail deployment operations and marine terminal operations.

The course has extensive practical exercises. These include solving computerized movement planning and status system (COMPASS) and automated unit equipment list (AUEL) problems, loading out organizational cargo using containers and cargo vehicles and planning CONUS convoys and rail deployments with an all-day load out at Fort Eustis' rail training site and a port of embarkation exercise. The latter is conducted at Lambert's Point docks in Norfolk, Virginia, using the fast sealift ship training berth.

Unlike the highway and rail training that stress the UMO's direct involvement in planning and conducting those operations, the marine terminal training doesn't involve vessel stowage, which is a transportation-specific function. It focuses on the port activities and the support provided both to and from the unit deploying through the port.

Air Deployment Planning Course

The ADPC is a three-week course producing qualified air load planners. This course is for company-grade UMOs and unit movement NCOs from all services, as well as civilians involved in the process. The ADPC has multi-media instruction emphasizing hands-on practical exercises to teach students hazardous cargo considerations, preparation of unit equipment and personnel for movement and about the Civil Reserve Air Fleet. Students use references and regulations to plan unit moves; determine aircraft characteristics and limitations; prepare and load 463L pallets; and secure vehicles and pallets on CH47 helicopters and C130, C141 and C5 aircraft. Practical exercises teach detailed load planning, cargo and passenger manifest preparation, cargo loading and CH47 sling loading. Graduates of this course can plan all aspects of unit strategic air deployment worldwide.

Strategic Deployment Planning Course

The Strategic Deployment Planning Course now in development is targeted at the supporting plan developer and is designed to make him strategic deployment literate. It will teach the unit movement data process, how it feeds into various automated data processing (ADP) systems, the interrelationships among systems and how to extract and use data from the systems.

Conclusion

SPDC and ADPC are joint courses open to unit movement personnel (E5 and above) of all services and Army branches, including National Guard and Reserves. There are five SDPC and four ADPC courses scheduled for FY 89 remaining. Each ADPC follows an SDPC. Students may enroll through their training offices to the office of the Deputy Chief of Staff for Training, Headquarters, Training and Doctrine Command, Fort Monroe, Virginia, AUTOVON 280-2161 or commercial (804) 727-2161 (Janice Neff). A reservation is made for the student in one of the upcoming classes. It's then up to the student's unit to provide orders.

For further information about the Joint Strategic Deployment Training Center and the courses offered, call the Air Deployment Division, AUTOVON 927-4953 or commercial (804) 878-4953, or the Surface Deployment Division, AUTOVON 927-5862 or commercial (804) 878-5862, at the Transportation School. For more information about the Strategic Deployment Planning Course, call the Strategic Deployment Division, AUTOVON 927-2039 or commercial (804) 878-5862.